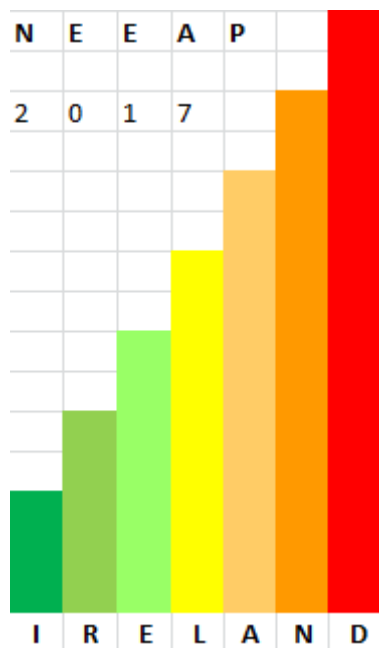




Roinn Cumarsáide, Gníomhaithe
ar son na hAeráide & Comhshaoil
Department of Communications,
Climate Action & Environment

NATIONAL ENERGY EFFICIENCY ACTION PLAN for Ireland # 4 2017-2020



Contents

1. Introduction and Overview	8
2. National Targets and Savings	11
2.1 Overview of national 2020 energy efficiency targets	11
2.2 Additional energy efficiency targets	13
2.3 Overview of energy savings	14
3. Buildings - Residential	15
3.1. Domestic Supports – Better Energy Programme (residential Retrofit)	15
3.1.1 Better Energy Homes B1	15
3.1.2 Better Energy Warmer Homes B2	16
3.1.3 Other Better Energy Programme Measures	16
3.1.4 Housing aid for older people	16
3.2 Support for EPBD Objectives	17
3.2.1 Cost Optimal Methodology	19
3.2.2 Nearly Zero Energy Buildings	19
3.2.3 Heating and Air-Conditioning Inspections	19
3.3 Buildings renovation strategy	20
3.4 New Buildings	20
3.4.1 Use of more energy efficiency appliances	24
3.5 Savings arising from measures on energy efficiency in buildings	24
4. Public Bodies	26
4.0 Overview of Central government buildings	26
4.1 Purchasing by public bodies	28
4.2 Energy Efficiency in the Public Sector – Ireland’s Strategy	29
4.3 Supports to the Public Sector	31
4.4 Savings from measures in central government and other public bodies	32
5. Commercial Sector	33

5.1	Industry programmes.....	33
5.1.1	Energy audits and management systems	33
5.1.2	Large Industry C2.....	34
5.1.3	SME Supports C3	34
5.1.4	Energy Services - National Energy Services Framework	35
5.1.5	Accelerated Capital Allowance/TripleE (Energy Efficient Equipment) C1.....	36
5.2	Savings arising from industry measures	36
6.	Energy Supply.....	38
6.1	Metering and billing.....	38
6.1.1	Frequency and type of billing information	38
6.1.2	Smart Metering E1	39
6.2	Energy transformation, transmission, distribution and demand response.....	40
6.2.1	Energy efficiency criteria in network tariffs and regulation	40
6.2.2	Demand Response	42
6.2.3	Demand Side Management Benefits	43
6.2.4	Examples of Demand Side Initiatives	43
6.2.5	System Services.....	44
6.3	Changes to the Market	45
6.4	Energy efficiency in network design and operation	46
6.4.1	Electricity Infrastructure – (cost effective energy efficiency improvements)	46
6.4.2	Gas Networks – energy efficiency.....	47
6.5	Savings arising from all energy supply measures	47
7.	Transport.....	49
7.1	Overview of Main policy measures for energy efficiency in transport.....	49
7.1.1	Role of EU Regulations in Increasing Efficiencies in the Transport Sector:	49
7.1.2	Rebalancing of National Vehicle Registration Tax (VRT) and Motor Tax regimes:	50
7.1.3	Promoting Alternative Fuels and Technologies:	51
7.1.4	Eco-driving:	52
7.1.5	Public and Sustainable Transport Investment:	52
7.1.6	Improving Energy Efficiency in the Different Transport Sectors:	54

7.1.7	Land and Transport Planning:	58
7.1.8	National Intelligence Transport System Strategy:	58
7.1.9	Carbon Tax T7.....	58
7.2	Savings arising from transport measures.....	58
8.	Cross Sectoral (Horizontal) Measures.....	60
8.0	Horizontal measures	60
8.1	Energy Efficiency Obligation Scheme X1.....	60
8.2	Existing Training and Certification Schemes	63
8.3	Other energy efficiency measures of a horizontal nature	64
8.3.1	Split Incentives	65
8.3.2	Energy-related products	65
8.4	Financing Measures	66
8.4.1	Energy Efficiency Fund	66
8.4.2	Financing approaches across sectors.....	66
8.5	Promotion of efficient heating and cooling	70
8.5.1	Comprehensive assessment.....	70
8.5.2	Application of Planning and Building Regulations to high efficiency co-generation,	71
	district heating and cooling.....	71
8.5.3	REFIT 3 X2.....	72
	Renewable Electricity Support Scheme (RESS)	72
	Renewable Heat Incentive (RHI)	72
8.5.4	Cogeneration.....	72
8.5.5	Individual installations: cost-benefit analysis, results and exemptions.....	73
9.	New, Innovative & Potential Measures	75
9.1	Expansions and enhancements to previous measures	75
9.1.1	Improvements to the BEP.	75
9.1.2	BER Certs	75
9.1.3	EEOS Expansion.....	75
9.1.4	Better Supports to Public Sector	75
9.1.5	Better Energy Communities Programme B3	75

9.1.6	Awareness, Education & Promotion	76
9.1.7	Cost Effective Energy Efficiency improvements in Electricity Infrastructure	76
9.2	New and Innovative Initiatives.....	76
9.2.1	Warmth and Wellbeing Pilot Scheme B4	76
9.2.2	Deep Retrofit Pilot B5.....	77
9.2.3	Energy Audits for Large Energy Users	77
9.2.4	Behavioural Economics Unit X3	77
9.2.5	Technical Bureau P1	77
9.2.6	Energy Standards and Design (EXEED).....	77
9.2.7	DS3 System Services.....	78
9.3	Potential Measures	78
Glossary of Terms		79
Appendix		82

List of Tables

Table 1: Energy and CO2 savings achieved and anticipated.....	10
Table 2: Summary primary and final energy forecasts for Ireland to 2020	11
Table 3: Underlying macro-economic assumptions for summary energy forecasts	12
Table 4: Estimates of key national energy consumption figures in 2020	13
Table 5: National targets for Nearly Zero Energy Buildings	14
Table 6: Overview of the estimates of primary and final energy savings.....	14
Table 7: Housing Aid for Older People, 2010-2016.....	17
Table 8: Energy efficiency savings in social.....	23
Table 9: Energy Savings in buildings sector and projections for 2020.....	25
Table 10: Calculation of target for naturally ventilated office buildings	26
Table 11: Calculation of target for air conditioned office buildings	27
Table 12: Calculation of total energy saving target	27
Table 13: Total useful floor area	27
Table 14: Energy savings achieved from public sector measures.....	32
Table 15: Energy savings from commercial (including industry) measures.....	37
Table 16: Electricity Infrastructure commissioned 2013-2016.....	47
Table 17: Savings from energy supply measures	48
Table 18: Energy savings from Transport measures	59
Table 19: Description of Alternative policy measures	63
Table 20: BER expenditure and estimation of funding for 2014-2016	67
Table 21: Better energy funding	68
Table 22: Housing Aid for older people, 2010-2016.....	68
Table 23: ACA Scheme Investment	69
Table 24: Savings projected from Cross Sectoral measures	74

List of Figures

Figure 1: Domestic BERs by grade.....	18
Figure 2: Non-domestic BERs by grade	18
Figure 3: Total primary energy consumption reported for 2015.....	29
Figure 4: Sources of energy savings	30
Figure 5: Shares of new private cars by emissions band 2000-2015 (+2016 to October)	50
Figure 6: EEOS 2014 to 2016 GWh.....	61
Figure 7: Energy poor credits	62
Figure 8: Residential credits	62
Figure 9: Non-residential credits.....	62

I. Introduction and Overview

In 2009, Ireland set a national target to improve its energy efficiency by 20% by 2020, meaning that energy savings of 31,925 GWh should be made. This fourth National Energy Efficiency Action Plan sets out progress towards that target and the measures to maximise progress to the target. This Plan builds on its predecessors which are available online at the [NEEAP web page](#) of the Department of Communications, Climate Action and Environment website¹.

Significant progress has been made towards this NEEAP target and the anticipated energy and CO₂ savings achieved and those anticipated for 2020 are summarised in Table 1. Based on SEAI's latest assessment, implementation of our third NEEAP has resulted in energy savings of 18,654 GWh of the target 31,925 GWh. In other words just under 12% of the national target of 20% was achieved by the end of 2016. These estimates project achieving 25,904 GWh by 2020 - based on the measures currently in place and funded. This would equate to achievement of 16.23% out of the 20% target i.e. a 3.77 percentage point shortfall. The key objective of this NEEAP is to maximise progress to the target based on the resources we expect to have available. Progress projections will continue to be reviewed as part of the monitoring process of implementing this NEEAP.

Assessments of the efficiencies achieved and projections are provided by the Sustainable Energy Authority of Ireland (SEAI) based on measurement and modelling. This represents the most up to date data available at the time of producing this document (April 2017). The key assumptions on which these are based are described elsewhere in this Plan.

While the NEEAP national target is 20% improvement in energy efficiency by end 2020 Ireland has set a more ambitious target of 33% improvement in energy efficiency for its public sector. This public sector effort also contributes to the national effort on the NEEAP 20% target as well as ensuring our public sector provides leadership on energy efficiency for the whole of our economy and society. At the end of 2015 energy efficiency in Ireland's public sector had improved by 21%.

The Energy White Paper - '[Ireland's Transition to a Low Carbon Energy Future 2015-2030](#)'² published in December 2015 provides a complete energy policy update. It sets out a framework to guide policy and the actions that Government intends to take in the energy sector up to 2030. It takes account of European and International climate change objectives and agreements, as well as Irish social, economic and employment priorities. The vital role for energy efficiency in meeting national and international objectives is clearly articulated in the White Paper.

There are a number of policy and strategy documents that are relevant to and which complement the NEEAP – and some of the main ones are outlined below.

The National Mitigation Plan (NMP) which will be revised every 5 years – which sets out how Ireland will transition to a low carbon, climate resilient and environmentally sustainable economy. The NMP focuses on climate action and emissions reduction and outlines policies and measures in place and under consideration to reach national climate goals. Energy Efficiency has a key role to play in the NMP and its chapter on “Energy Efficiency in the Built Environment” focuses on the importance of energy efficiency measures to achieving a low carbon economy and society.

¹ [http://www.dccae.gov.ie/en-ie/energy/topics/Energy-Efficiency/national-energy-efficiency-action-plan-\(neeap\)/Pages/National-Energy-Efficiency-Action-Plan-\(NEEAP\).aspx](http://www.dccae.gov.ie/en-ie/energy/topics/Energy-Efficiency/national-energy-efficiency-action-plan-(neeap)/Pages/National-Energy-Efficiency-Action-Plan-(NEEAP).aspx)

² <http://www.dccae.gov.ie/documents/Energy%20White%20Paper%20-%20Dec%202015.pdf>

Recent progress monitoring on the national effort to achieve the NEEAP and climate related emissions targets made clear that for the 20% target to be achieved an intensification of efforts and additional investment would be required. Ireland has brought forward a number of new initiatives. These include Ireland's first [Public Sector Energy Efficiency Strategy](#)³, (Published in early 2017 and covered further in Chapter 4), and a draft [National \(low carbon\) Mitigation Plan](#)⁴ (the final version will be published in summer 2017) in which there is a significant emphasis on energy efficiency as well as others referenced elsewhere in this Action Plan and in the Energy White Paper. In addition Ireland's next Long Term Renovation Strategy will be published in mid 2017.

The new [Public Sector Energy Efficiency Strategy](#) – published in early 2017 – provides the framework to build on the progress already made. It identifies where potential for further savings exist, puts in place a new governance structure and provides for enhanced project development assistance to better enable public sector bodies to identify and develop larger scale energy efficiency projects.

An overview of energy supply and demand in Ireland is provided in "[Energy in Ireland 1990-2015](#)"⁵ – published in 2016. It provides a picture of energy trends and drivers including sectoral energy consumption. It shows that following a trend of reduced energy use over the period 2008 to 2014 energy use increased in the year 2014-15 – attributed primarily to economic growth. This indicates that despite some success in decoupling energy use from economic growth further efforts will be needed in this regard. Nonetheless, overall energy use is down 15% compared to 2008. In the residential sector unit consumption of energy per dwelling decreased – by 32% over the period 1990 – 2015. The most recent emissions forecasts from the EPA were published in April 2017 and are available on the EPA website [GHG emissions page](#).⁶

Arising from the analysis conducted for those strategies and this process very significant additional Exchequer funding has been made available through DCCAE for 2017 for energy efficiency related measures to enable a scaling up of effort. The budget allocation to SEAI for energy efficiency and related measures has been increased from €72.7 million in 2016 to €100.2 million for 2017. This €27.5 million (37.8%) year on year increase in resourcing will facilitate enhancement of the range of supports available for energy efficiency and renewable energy objectives including expansion of existing initiatives and introduction of new initiatives described elsewhere in this Action Plan. This intensification of effort will reduce the shortfall to target and build capacity to absorb more investment in following years, should that become available.

The format used for this fourth National Energy Efficiency Action Plan is partially modelled on the format used for NEEAP 3 modified having regard to Commission guidance presented at the Concerted Action on the Energy Efficiency Directive⁷.

³ <http://www.dccae.gov.ie/documents/Public%20Sector%20Energy%20Efficiency%20Strategy.pdf>

⁴ <http://www.dccae.gov.ie/en-ie/climate-action/consultations/Pages/National-Mitigation-Plan-.aspx>

⁵ http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy-in-Ireland-1990-2015.pdf

⁶ <http://www.epa.ie/pubs/reports/air/airemissions/ghgemissions/>

⁷ The Concerted Action on the Energy Efficiency Directive is a forum established to support the effective implementation of the Energy Efficiency Directive and to facilitate the exchange of information between member states and their experiences. More information on the CA EED can be found at <http://www.ca-eed.eu/home>

Table 1: Energy and CO2 savings achieved and anticipated.

Sector	Primary Energy Savings (GWh, PEE)		CO2 savings (kt CO2)		Final Energy Savings (GWh)	
	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
Public Sector	2,195	2,795	502	624	1,784	2,303
Business	3,744	4,384	887	1008	3,062	3,556
Buildings	5,578	7,482	1354	1806	5,375	7,189
Transport	1,331	1,501	339	383	1,331	1,501
Cross sectoral	2,527	4,462	603	1042	2,351	4,046
Energy supply (low)	3,279	5,279	708	1066	-	-
Total	18,654	25,904	4,393	5,929	13,903	18,595

The projections in the table above and its associated tables were current at the time of producing this document. In the event that assumptions are revised, new efficiencies are identified, allowed or forthcoming the projections will be subsequently updated.

Acknowledgement - The Department of Communications, Climate and Environment would like to acknowledge the contribution, expertise, advice and input of the many organisations and their staff who have made the production of this Action Plan possible, including; the:- Central Statistics Office; City and County Management Association; Commission for Energy Regulation; Department of Housing, Planning Community & Local Government; Department of Jobs, Enterprise and Innovation; Department of Public Expenditure and Reform; Department of Transport, Tourism and Sport; Economic and Social Research Institute; Eirgrid; Enterprise Ireland; Environmental Protection Agency; ESB; European Commission; Gas Networks Ireland; Irish Green Building Council; National Treasury Management Agency; Office of Government Procurement; Office of Public Works; Sustainable Energy Authority of Ireland; and Transport Infrastructure Ireland.

2. National Targets and Savings

2.1 Overview of national 2020 energy efficiency targets

Please state the indicative national energy efficiency target for 2020 as required by Article 3(1) of the EED (EED Article 3(1), Annex XIV Part 2.1)⁸

The indicative national energy efficiency target was established in the Government's [2007 Energy White Paper](#)⁹ and further detailed in Ireland's first NEEAP as 31,925 GWh (primary energy savings).

SEAI produces an annual energy forecast to inform debate on future energy trends, particularly as they relate to national and EU policies on energy efficiency, renewable energy, climate change, air quality and security of energy supply. This includes providing information for use by Ireland's Environmental Protection Agency (EPA) in preparing energy related projections of greenhouse and trans-boundary gas emissions. This work is undertaken together with the Economic and Social Research Institute (ESRI) and relies on their detailed macro-economic model for initial outputs, on to which are mapped the expected impacts of energy efficiency policies and measures to 2020. Recent published reports, including a detailed methodological description of the process) are available on the [SEAI Energy Forecasts Page](#)¹⁰. The most recent forecasts from the EPA were published in April 2017 and are available on the EPA website [GHG emissions page](#)¹¹.

The summary results provided in Table 2 below is the latest update on energy use in Ireland. The trends to 2020 are influenced by macro-economic variables (changes in projected energy prices, GDP growth rates etc.) together with the estimated impact of energy efficiency policies and measures. The NEEAP/NREAP (National Renewable Energy Action Plan) "Policy"¹² scenario results indicate the expected final and primary energy demand in 2020 after the progress towards achieving the policies and measures detailed in Ireland's National Energy Efficiency Action Plan (NEEAP) and National Renewable Energy Action Plan (NREAP) as submitted to the Commission is evaluated based on the current trajectory. The difference between final and primary energy are based on conversion efficiencies of all separate electricity generation stock and are accounted for using detailed electricity system modelling undertaken as part of the forecasting process.

Please indicate expected impact of the target on primary and final energy consumption in 2020 (EED Article 3(1), Annex XIV Part 2.2(a))

Table 2: Summary primary and final energy forecasts for Ireland to 2020

	Baseline (primary) GWh	NEEAP/NREAP (primary) GWh	Baseline (final) GWh	NEEAP/NREAP (final) GWh
2013	154,999	154,999	126,478	126,478
2016	163,881	163,014	131,313	137,107
2020	175,636	173,326	149,135	148,525

Source SEAI 2016 Unpublished. The difference between the baseline and the policy scenario is not equivalent to the target since much of the work completed is included in the baseline.

⁸ Text in a pink background such as here denotes specific requirements under the Energy Efficiency Directive to which the accompanying content (below) relates.

⁹ http://www.seai.ie/About_Energy/Energy_Policy/European_Union_Drivers/EnergyWhitePaper12March2007.pdf

¹⁰ http://www.seai.ie/Publications/Statistics_Publications/Energy_Forecasts_for_Ireland/

¹¹ <http://www.epa.ie/pubs/reports/air/airemissions/ghgemissions/>

¹² The "Policy" scenario would entail an outcome whereby all of the measures set out in the NEEAP and NREAP are funded and implemented.

Table 3: Underlying macro-economic assumptions for summary energy forecasts

	2010-15	2015-20	2020-25	2025-30	2030-35
GDP	2.0%	3.7%	3.2%	2.6%	2.6%
GNP	1.2%	3.4%	3.3%	2.0%	2.0%
National Resources (GNDI + Capital Transfers)					
Investment	-6.8%	7.7%	6.4%	3.9%	3.9%
Productivity (GDP per head)	1.7%	2.9%	2.4%	1.9%	1.9%
Average Non-Agricultural Earnings					
Consumption Deflator	1.4%	1.4%	1.5%	1.5%	1.5%
Employment, April	1838	2024	2280	2427	2537
Labour Force, April					
For end Year:	2015	2020	2025	2030	2035
Net Immigration	-25.5	7.1	12.5		
Unemployment rate, ILO Basis %	12.6	7.3	6.4		
Balance of Payments, % of GNP	21	32.2	31.5		

**Table above includes as much data as was available at time of drafting.*

Explain briefly the rationale for the 2020 target (EED Article XIV Part 2.2 (a))

The Energy Services Directive (ESD) specified that the 9% target was to be calculated as 9% of a baseline Reference Energy Consumption (REC). The REC is calculated as the average of the most recent 5-year period (2001–2005) of unadjusted final energy consumption, expressed as ‘primary energy equivalent’. The conversion to primary energy equivalent takes into account the conversion losses in electricity generation and makes units of different energy streams more comparable. The final energy consumption is converted to primary energy equivalent by multiplying the electricity component by a factor (then assumed to be 2.5) to reflect the average electricity generation efficiency during the reference period (assumed to be 40%) and adding it to the remainder of the final energy consumption, as in the following formula:

$$\text{Primary energy equivalent PEE} = (\text{Total Final Consumption (TFC)} - \text{Electricity TFC}) + (\text{Electricity TFC} \times 2.5)$$

In setting its national target for the first NEEAP Ireland adopted the ESD target setting approach for the national target. This is calculated as 20% of the average of unadjusted final energy consumption 2001–2005, expressed as ‘primary energy equivalent’. The national target covers the whole economy, excluding aviation and marine bunker fuels.

In accordance with Article 24(2) of the EED please provide an estimate of overall primary energy consumption and consumption by sectors in 2020 (EED Article 24(2))

Table 4: Estimates of key national energy consumption figures in 2020

Estimate of energy consumption in 2020	GWh
Total primary energy consumption in 2020	173,326
Electricity transformation input (thermal power generation)	41,257
Electricity generation output (thermal power generation)	19,849
Electricity generation output (renewables)*	11,378
Energy distribution losses (all fuels)	2,722
Total final energy consumption	148,525
Final energy consumption – Industry	32,839
Final energy consumption - Transport	60,191
Final energy consumption - Households	33,533
Final energy consumption - Services	19,154
Final energy consumption - Agriculture	2,808

*wind, hydro, ocean and solar PV only

2.2 Additional energy efficiency targets

Please list any additional national targets related to energy efficiency (EED Annex XIV Part 2.1)

Ireland has set a 33% target for the public sector to demonstrate an exemplar leadership role on energy efficiency and climate action. It has been determined using the same methodology as for the national target but using final demand only for the public sector. It was calculated as equating to 3,240 GWh (primary energy) savings for the last NEEAP based on the best estimates available at that time. As a result of the detailed energy monitoring and reporting system put in place to underpin the public sector programme a more detailed and accurate picture of public sector energy use is now possible and detailed in the [Annual Report 2016 on Public Sector Energy Efficiency Performance](#)¹³. Based on this data the 33% efficiency target for the public sector is currently estimated to equate to 3,910 GWh by 2020. Based on the most recent data available (end 2015) public sector bodies reported 21% improved efficiency – amounting to 2,422 GWh (annual primary energy savings).

¹³ http://www.seai.ie/Publications/Your_Business_Publications/Public_Sector/Annual-Report-2016-on-Public-Sector-Energy-Efficiency-Performance.pdf

Please identify a national intermediate target for nearly zero buildings for 2015 in accordance with recast EPBD Articles 9(11) and 9(3b) for new buildings (EPBD Article 9(1), Article 9(3b))

Table 5: National targets for Nearly Zero Energy Buildings

	<i>New buildings – target as a percentage of total newly constructed buildings</i>
2015	60% improvement is applied to all residential buildings since 2011.
2020	All buildings to achieve Nearly Zero Energy Building Standard from Jan 2019. Residential buildings to achieve an improvement of 70% over 2005 standards. Non Residential to achieve an improvement in range of 50% to 60% over 2008 Standard.

2.3 Overview of energy savings

Please provide an overview of the primary energy savings achieved by the time of reporting and estimations of expected savings for 2020 (EED Article 3(1), Article 24(2), Annex XIV Part 2.2(a))

For the purposes of Directive 2006/32/EC, in the first and the second NEEAP, please provide information on the achieved final energy savings and forecast savings in energy end-use by 2016 as defined by Directive 2006/32/EC (EED Article 27(1), Annex XIV Part 2.2(b), second paragraph)

The primary and final energy savings achieved and projected are set out in Table 6 below.

Table 6: Overview of the estimates of primary and final energy savings

Overview of Energy Savings		
	Primary energy savings (GWh)	Final energy savings (GWh)
2016 (achieved)	18,654	13,903
2020 (anticipated)	25,904	18,595

These figures have been calculated and modelled by SEAI based on stipulated assumptions. Where there is scope for an estimate range generally the more conservative figure has been used.

3. Buildings - Residential

3.1. Domestic Supports – Better Energy Programme (residential Retrofit)

Please provide information on measures adopted or planned to promote and facilitate efficient use of energy by SMEs and domestic customers (EED Article 132, Article 17 Annex XIV Part 2.2)

The measures relating to domestic customers are covered below while measures relating to SMEs are dealt with in Chapter 5.

For the residential sector Ireland's domestic supports are implemented under the umbrella of the Better Energy Programme by the SEAI. The Better Energy Programme brought the three existing energy programmes: Home Energy Saving Scheme (HES), Warmer Homes Scheme (WHS) and Greener Homes Scheme (GHS), under one umbrella, the 'Better Energy' brand in 2011. The programme is designed to ensure that there are supports available for householders who wish to reduce their energy consumption and achieve real and lasting energy cost savings. The programme is administered by the Sustainable Energy Authority of Ireland (SEAI) on behalf of the Department of Communications, Climate Action and Environment (DCCAE).

While the Better Energy Programme has been extremely successful in encouraging homeowners to carry out energy efficiency works, the majority of savings have come from lower cost, more accessible measures such as attic and wall insulation, and in some cases heating controls, solar heating/hot water and energy conservation campaigns. Tackling these easier, cheaper measures first is a sensible approach and it has done a great deal to raise awareness of energy efficiency. Now, with the aim of putting Ireland on realistic trajectory to 2030 and 2050 climate and energy targets, as outlined in the recently published [Draft National Mitigation Plan](#)¹⁴ the depth of energy efficiency upgrades needs to increase. Over the lifetime of this NEEAP the Department will be working with SEAI to reform each of the energy efficiency support schemes to ensure that these schemes can effectively support those householders who want to undertake a deep renovation of their homes.

3.1.1 Better Energy Homes B1

The Better Energy Homes scheme provides a financial incentive to private homeowners who wish to improve the energy performance of their homes. Fixed grants are provided towards the cost of a range of measures including attic insulation, wall insulation, heating systems upgrades, solar thermal panels and accompanying Building Energy Rating (BER).

In 2016, €17 million was spent on the scheme which resulted in over 15,000 homeowners undertaking 36,000 energy efficiency measures in their homes. It is anticipated that this has delivered energy savings of 84.26GWh (28.77 ktCO₂). Since the start of the scheme, over €202.4 million worth of grants has been paid to homeowners. These funds have supported the upgrade of 191,338 homes, with a total 475,190 individual energy efficiency measures undertaken.

¹⁴ <http://www.dccae.gov.ie/documents/National%20Mitigation%20Plan.pdf>

A review of the technologies supported by the Better Energy Homes is currently underway. This review will consider the range of technologies that are available to deliver energy savings and look at where Government support will be most effective. It is envisaged that the review will be complete by the end of 2017 with implementation from 2018.

3.1.2 Better Energy Warmer Homes B2

The Better Energy Warmer Homes scheme is a housing retrofit scheme targeted at those living in, or at risk of, energy poverty. Energy efficiency upgrades are delivered free of charge to those who meet the eligibility criteria which were broadened in 2016 following the publication of the Government's [Strategy to Combat Energy Poverty](#)¹⁵. Recipients of the scheme do not receive grants but have measures installed free of charge. Measures available include draught proofing, attic insulation, lagging jackets for hot water tanks, low energy light bulbs and cavity wall insulation.

In 2016, €20 million was spent under the Better Energy Warmer Homes scheme which supported the delivery of energy efficiency measures to 6,743 energy poor homes. This resulted in energy savings of 15.5 GWh, corresponding to monetary savings of €0.98million (3.6 kt CO₂) and supporting an estimated 336 jobs.

The scheme is managed by the SEAI and delivered through a panel of contractors and community based organisations (CBOs), augmented by a panel of private contractors in order to ensure national coverage. Since its creation, the scheme has upgraded 126,889 premises/dwellings with more than €175 million invested.

Ireland's approach – as detailed elsewhere in this document – is to continue to support and develop proven effective energy efficiency measures, enhancing these where possible, consistent with availability of resources. In tandem, a number of new pilot initiatives have been instigated. The objective of these new initiatives is to provide insights that will inform the next phase of measures to be developed. There is a particular focus on how to effectively promote and deliver more deep renovation that would better facilitate fuel switching to lower carbon energy solutions to make a greater contribution to national and EU energy efficiency and climate objectives.

3.1.3 Other Better Energy Programme Measures

Three other programmes: - Better Energy Communities, the Warmth and Wellbeing Pilot Scheme and the Deep Retrofit Pilot scheme are covered in Chapter 9 – “New and Innovative measures”.

3.1.4 Housing aid for older people

The Department of Housing, Planning, Community and Local Government administers the Housing Aid for Older People scheme which provides grants of up to €8,000 to assist older people living in poor housing conditions to have necessary repairs or improvements carried out. Grant eligible works include structural repairs or improvements, re-wiring, repairs to or replacement of windows and doors, provision of water supply and sanitary facilities, provision of heating, cleaning and painting.

¹⁵ [http://www.dccae.gov.ie/en-
ie/energy/publications/Documents/5/A%20Strategy%20to%20Combat%20Energy%20Poverty%20-
%20Web%20Version.pdf](http://www.dccae.gov.ie/en-ie/energy/publications/Documents/5/A%20Strategy%20to%20Combat%20Energy%20Poverty%20-%20Web%20Version.pdf)

Table 7: Housing Aid for Older People, 2010-2016

Year	Number of homes that received a grant	Total Investment €m
2010	7,205	30.774
2011	6,511	27.102
2012	4,848	19.910
2013	2,815	11.247
2014	3,634	13.498
2015	3,127	11.267
2016	3,425	12.647
Total	31,565	126.445

3.2 Support for EPBD Objectives

Please present a calculation of cost optimal levels of minimum energy performance (EPBD Article 5(2))

In accordance with the requirements of Article 10(2) of the EPBD, please provide a list of measures and instruments to support EPBD objectives (EPBD Article 10(2))

Alternative measures for heating and air conditioning systems (EPBD Article 14(4), Article 15(4))

EU Recast Energy Performance of Buildings Directive (EPBD)

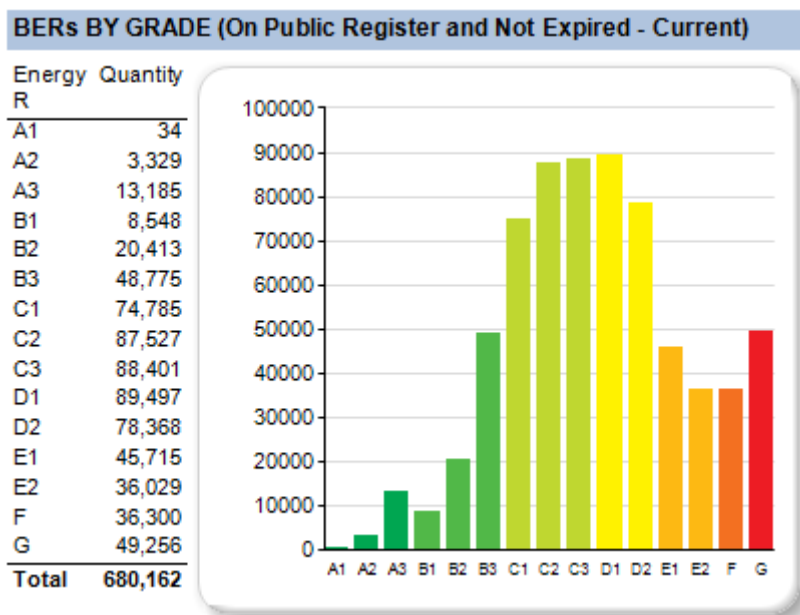
The Building Energy Rating (BER) scheme was established under the European Communities (Energy Performance of Buildings) Regulations 2006. A BER is an indication of the energy performance of a house on a scale of A (most efficient) and G (least efficient). The SEAI has been designated as the issuing authority with responsibility for registering BER assessors, logging BER assessments and managing the BER scheme. The BER was introduced for new dwellings in January 2007 and for all buildings from 1st Jan 2009.

The Recast EPBD has been fully transposed and implemented in Ireland largely in the form of the European Union (Energy Performance of Buildings Regulations) 2012 and Part L of the Building Regulations which requires:

- a valid BER to be obtained whenever a building is commissioned or is offered for sale or letting;
- the quoting of building energy ratings in advertisements for buildings offered for sale or letting;
- the setting of statutory minimum energy performance requirements for buildings and building elements to be informed by the cost optimal framework methodology developed by the EU Commission;
- the application of minimum energy performance requirements to existing buildings undergoing a major renovation;
- the development of plans for increasing the numbers of low or zero energy buildings with the public sector showing leadership by investing in such buildings; and
- the display of energy performance certificates in all large buildings which are frequently visited by the public.

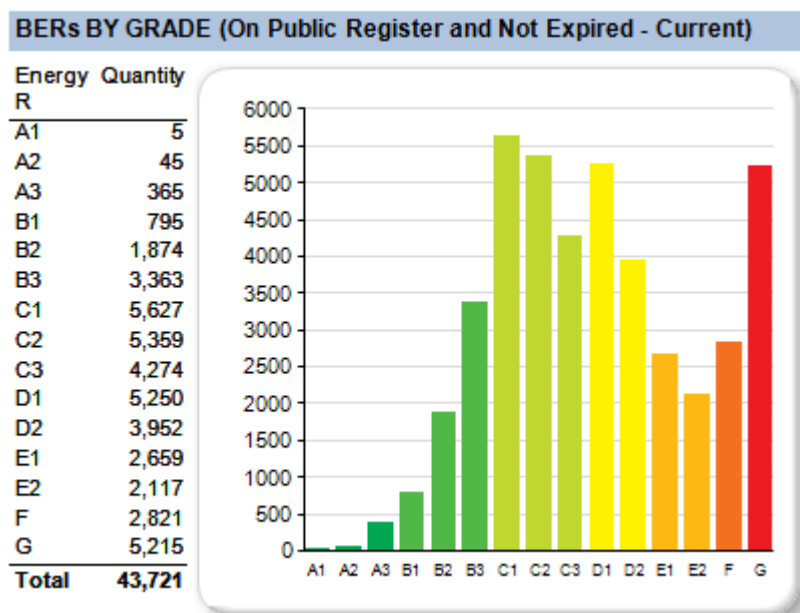
As at the end of February 2017 over 540 BER assessors for dwellings were registered with SEAI and over 680,100 BER certificates for individual dwellings were in place. For buildings other than dwellings the corresponding numbers were 165 assessors and over 43,700 BERs (see Figures 2 and 3 below). SEAI will periodically publish updates to these figures which will be available at [BER Statistics](#).¹⁶

Figure 1: Domestic BERs by grade



Source SEAI April 2017

Figure 2: Non-domestic BERs by grade



Source SEAI April 2017

¹⁶ BER statistics can be accessed on the SEAI website at www.seai.ie/Your_Building/BER/BER_FAQ/FAQ_BER/General/BER_Statistics.html

3.2.1 Cost Optimal Methodology

Cost-optimal levels of minimum energy performance requirements for buildings and building elements have been calculated for residential and non-residential buildings as required by the Recast Energy Performance of Buildings Directive (EPBD). Ireland's first report on Cost Optimality was submitted to the EU Commission in March 2013 and is publicly available on the Department of Housing Planning Community and Local Government¹⁷ website.

Energy performance requirements set under Part L of the Building Regulations (Conservation of Fuel and Energy) are already at the lower end of the cost optimal range for new dwellings. Part L of the Building Regulations is currently under review in respect of new buildings other than dwellings and new energy performance targets will be set at Nearly Zero Energy Building in 2017. Performance standards for existing buildings were also reviewed as part of the cost optimal study and Major Renovation performance requirements will also be set in 2017 for Buildings other than Dwellings. Subsequent reports are due in 2018 and can be submitted at that stage.

3.2.2 Nearly Zero Energy Buildings

Under Article 9 of the recast EPBD, Member States are required to draw up national plans for nearly-zero energy buildings. Ireland's outline plan, *'Towards Nearly Zero Energy Buildings in Ireland: Planning for 2020 and Beyond'*, was first submitted to the Commission in November 2012. An updated and more detailed plan was submitted to the Commission in April 2013. The Plan is intended to provide an evolving definition which will be further developed in light of cost optimal calculations, consultation and review as well as further developments in relation to policy and legislation. The Plan is available on the Commissions website¹⁸.

In addition, the EPBD Implementation Group – comprising the Department of Communications, Climate Action and Environment (DCCA), Department of Housing Planning, Community and Local Government (DHPCLG) and SEAI – actively monitor progress on the implementation of the recast EPBD's energy efficiency objectives in relation to new nearly zero energy buildings. Furthermore, energy efficiency measures in relation to existing buildings and Article 4 renovation plan will be monitored and implemented by the NEEAP Implementation Group.

All future reports from the European Commission will be reviewed in order to inform future policy decisions having particular regard to any specific recommendations that may be made in relation to the exchange of best practice and the establishment of any financial support programmes designed to improve energy efficiency in buildings.

3.2.3 Heating and Air-Conditioning Inspections

Ireland has opted for the alternative approach as permitted under Articles 14(4) and 15(4) of the EPBD. Ireland has submitted its equivalence reports, relating to both heating and air-conditioning, setting out the alternative measures with respect to the savings that will arise from these measures against those projected to arise under hypothetical inspection systems. These reports can be found on the Commission website.¹⁹

¹⁷ <http://www.housing.gov.ie/housing/building-standards/energy-performance-buildings/energy-performance-buildings>

¹⁸ http://ec.europa.eu/energy/efficiency/buildings/implementation_en.htm

¹⁹ http://ec.europa.eu/energy/efficiency/buildings/implementation_en.htm

3.3 Buildings renovation strategy

Please provide information on the national building renovation strategy (EED Article 4)

In 2014, DCCAE published Ireland's first ever [national renovation strategy](#)²⁰ – “Better Buildings - A National Renovation Strategy for Ireland” which seeks to provide a pathway towards reducing emissions from buildings in the domestic, commercial, industrial and public sectors. This strategy sets out the measures currently in place to reduce emissions in these sectors and sets out the factors that will be considered in developing new measures.

Ireland’s building renovation strategy for the residential sector focuses on the Better Energy Programme – it is implemented on behalf of DCCAE by the SEAI. Work is currently underway on Ireland’s next National Renovation Strategy – this will take account of recommendations arising from the stakeholder consultation process organised by the Irish Green Building Council and their recently [published report](#)²¹. As the potential for energy savings is so high, the buildings sector has become a priority area for the Government in trying to meet its ambitious climate and energy targets for 2020 and beyond.

Please provide details on additional measures addressing energy efficiency in residential and non-residential buildings as well as those that promote the use of energy efficient appliances and equipment in buildings (EED Article 24(2), Annex XIV Part 2.2(a))

3.4 New Buildings

As a result of the advancement in energy performance requirements of the Building Regulations, new dwellings in Ireland are at the forefront of energy efficiency standards in Europe. The requirements for advanced energy performance materials and systems in new dwellings in Ireland are also building capacity for Irish manufacturers in systems such as triple glazed windows, biomass boilers, electrical heating, smart technology systems and insulation materials.

Part L of the Building Regulations

All new buildings, extensions to existing buildings as well as material changes of use to existing buildings are subject to Part L of the Building Regulations (Conservation of Fuel and Energy) which sets statutory minimum energy performance requirements.

In the case of dwellings, an ambitious programme for upgrading the Regulations has been advanced over the past decade with the standards that pertained in 2005 being used as a benchmark for further improvements. The Regulations were upgraded in 2007 to achieve a 40% improvement in energy efficiency and a 40% reduction in associated carbon emissions relative to 2005 requirements. These Regulations also provided for the mandatory use of Renewable Energy Sources in new dwellings (a minimum of 10 kWh/m²/annum contributing to energy use for domestic hot water heating, space heating or cooling). These Regulations were further revised in 2011 to achieve an aggregate 60% improvement in energy efficiency and an aggregate 60% reduction in associated carbon emissions relative to 2005 requirements. The 2011

²⁰ <http://www.dccae.gov.ie/documents/Renovation%20Strategy%20for%20Ireland.pdf>

²¹ <http://buildupon.eu/wp-content/uploads/2015/09/IGBC-BUILD-Upon-Final-Web-24.02.17-1.pdf>

Regulations became fully operational (on the expiry of transitional planning-related exemptions) from 1 December 2013 and included provision for:-

- specified values for calculated Primary Energy and Carbon Dioxide Performance Coefficients to be met for each dwelling to achieve a 60% improvement relative to the 2005 benchmark;
- significant improvements in wall, roof and floor insulation levels and backstop U values;
- an improvement in window backstop U values
- a reduction in the air permeability backstop value
- an increased testing regime for air permeability where an air permeability value better than that of the default is being claimed
- more accurate thermal bridging heat loss calculations and specifications
- higher efficiency oil /gas fired boilers (this also applies when replacing boilers)
- minimum performance levels for the efficiency of biomass boilers
- independent time control of space heating zones, and
- improved maximum elemental U values to apply to building fabric elements where an existing dwelling undergoes a material alteration or where an existing building undergoes a change of use to function as a dwelling.

This upgrade in performance standards is a significant milestone in the roadmap towards Nearly Zero Energy Buildings (NZEB) and sets the performance of a typical dwelling at approximately 59kWh/m²/yr. The definition of Nearly Zero Energy Buildings was published in Building Regulations in January 2017. The numerical indicator is provided in an amended Technical Guidance Document L 2011 - Dwellings to Part L of the Building Regulations. The NZEB performance requirement represents a 70% improvement on 2005 standards and is set at a Maximum Permitted Energy Performance Coefficient and Maximum Permitted Carbon Performance Coefficient of 0.30 and 0.35 respectively.

Part L of the Building Regulations for Buildings other than Dwellings is under review in 2017 to achieve an improvement in performance in the order of 50% to 60% over 2008 standards and to introduce mandatory renewables for all new non-residential buildings.

In accordance with the EPBD requirements for the Public Sector to apply NZEB from 31st Dec 2018 a Public Sector Interim NZEB Performance Specification was issued in Dec 2016 for the design of new NZEB Public Sector Buildings owned and occupied by Public Authorities after 31st Dec 2018.

The Recast Energy Performance of Buildings Directive study to identify suitable cost optimal performance levels²² for various categories of buildings (e.g. public buildings, hotels, offices, retail outlets, etc.) and to define Nearly Zero Energy Building targets²³ was completed in 2013. This cost optimal study is now being used to inform performance standards for buildings other than dwellings and Nearly-Zero Energy Buildings. The definition of Nearly Zero Energy Buildings has also been submitted to the Commission as a requirement of the Recast EPBD.

Design of Large Buildings

The European Communities (Energy Performance of Buildings) Regulations 2006–2008 required that the economic and technical feasibility of alternative/renewable energy systems be assessed during the design of large buildings over 1,000m². This requirement has been operative since 1 January 2007. The recast EPBD

²² http://ec.europa.eu/energy/efficiency/buildings/implementation_en.htm

²³ http://ec.europa.eu/energy/efficiency/buildings/doc/ms_nzeb_national_plans.zip

now further requires that such feasibility studies will apply to all buildings (the size threshold of 1000m² no longer applies). As Part L for Buildings other than Dwellings plans to introduce mandatory renewables for all new buildings commencing construction in early 2019 the requirement for feasibility studies for new buildings will no longer be required where regulations require mandatory renewables.

Part L of the Building Regulations for Dwellings currently require that a reasonable proportion of the energy consumption to meet the energy performance of a dwelling is provided by renewable energy sources; since 1 July 2008. For buildings other than dwellings a similar requirement for renewables on all buildings is currently planned in order to meet the Nearly Zero Energy Building requirement of the Energy performance of Buildings Directive. This review of Part L of the Building Regulations for Buildings other than Dwellings has commenced and revised energy performance requirements are due to be published in 2017 to apply from 2019.

Design Guidelines for Social Housing

In recent years significant efforts have been made to ensure that all new construction projects, including the delivery of social housing stock, are designed and built to high energy efficiency and sustainable development standards. To that end, Part L of the current Building Regulations requires that all new housing, including social housing:

- has 60% lower heat energy demand than under previous requirements
- requires the installation and replacement (where practicable) of oil and gas boilers with not less than 90% energy efficiency (condensing boilers)
- requires the mandatory use of renewable energy sources (a minimum of 10 kWh/m²/annum)
- a social housing demonstration programme for low energy housing is also in place known as “Towards Carbon Neutral Housing”.

Standards for Renovation of Existing Buildings

Code of practice for the energy efficiency retrofit of dwellings

A national code of practice for the retrofit of dwellings – Standard Recommendation [\(S.R.\) 54 of 2014](#)²⁴ – has been developed by the National Standards Authority of Ireland (NSAI), the Department of Housing, Planning, Community & Local Government (DHPC&LG), the Department of Communications, Climate Action and Environment (DCCA – previously DCENR) and the Sustainable Energy Authority of Ireland (SEAI). The Standard Recommendation is based on the consensus of an expert panel and was subject to public consultation. This Code of Practice provides guidance to practitioners working on energy efficient retrofit works for dwellings. It provides technical guidance on the retrofit of the building fabric and services, the application of retrofit measures on a whole dwelling basis, general building science and the management of retrofit projects. The Guide is available to download for free from the National Standards Authority of Ireland website.²⁵

As part of the review of Part L Buildings other than Dwellings 2017 Major Renovation requirements to a cost optimal level will be introduced when more than 25% of the surface of the building envelope undergoes renovation. Similarly a major renovation requirement will be introduced for Dwellings as part of Part L dwellings review in 2018.

²⁴ <http://www.ili.co.uk/en/S.R.54-2014.pdf>

²⁵ <http://www.nsai.ie/S-R-54-2014-Code-of-Practice.aspx>

Higher standards of energy efficiency in existing social housing

Local Authorities are responsible for the maintenance and upgrade of social housing which is in Local Authority (LA) ownership. LA owned housing makes up approximately 6.6% of total housing stock²⁶. In accordance with the Energy Efficiency Directive and the Recast Energy Performance of Buildings Directive, Local Authorities (LAs) take an exemplar role in the retrofit of social housing.

Under the Social Housing Investment Programme, LAs are allocated capital funding each year in respect of a range of measures to improve the standard and overall quality of their social housing stock. The programme includes retrofitting measures aimed at improving the energy efficiency of older apartments and houses by reducing heat loss through the fabric of the building and the installation of high-efficiency condensing boilers.

For the years 2015 and 2016 the same programme has continued with over 16,000 and 11,300 dwellings being upgraded respectively. This resulted in a total energy saving of 43 & 38 GWh/yr respectively and a Carbon saving of 4.8 and 8.6 kt/CO₂. This was achieved with an expenditure of €26.9m for 2015 and €22.5m in 2016. This Energy Efficiency Programme continues with the same budget and targets for 2017 and a commitment has been made for it to extend as such until at least 2020.

These programmes also contribute to the reduction of energy poverty and are an example of the public sector providing leadership in setting of higher standards for the energy efficiency of housing.

The numbers of houses upgraded and the associated energy efficiency savings for this measure are set out in the Table below.

Table 8: Energy efficiency savings in social

Year	Number of houses upgraded	Energy savings (GWh)	Carbon savings (kt/CO ₂)
2009-2012	7,762	31.2	10.2
2013	10,100	24	4.8
2014	18,010	43	8.6
2015	16,002	38	7.6
2016	11,303	27	5.4

Higher standards of energy efficiency in Building Regulations for existing Buildings

Building Regulations apply in various ways to existing buildings where works are being performed on a building. The current legislation²⁷ prescribes how Building Regulations apply to existing dwellings.

With regards to building services, Part L of the Building Regulations applies to all works in connection with the provision (by way of new work or by way of replacement) to a building of services, fittings and equipment in

²⁶ Based on data obtained from DHPCLG report "Service Indicators in Local Authorities 2011" and CSO Profile 4 "The Roof over our Heads"

²⁷ SI 497 of 1997 as amended by SI 259 of 2008 and SI 513 of 2010

respect of which Parts G (Hygiene), H (Drainage and Waste Water Disposal) or J (Heat Producing Appliances) impose a requirement.

Part L of the Building Regulations also requires that replacement oil or gas boilers where practicable should have a boiler efficiency of greater than 90% in dwellings (condensing boilers \geq 86% efficiency). This part of the regulations also requires that renewal works to existing buildings involving the replacement of external doors, windows and roof-lights are subject to current regulations.

With regards to material change of use of a building Regulation 13 of S.I. No. 497 of 1997 (as amended) provides that the requirements of certain parts of the regulations including Part L shall apply to the building.

The above application of the Building Regulations to works to existing buildings will ensure that Building Regulations will apply to major renovations as required by the Recast Energy Performance of Buildings Directive. The above requirements also apply to renovations which are less than 25% of the surface area of the building and as such, the current provisions of the Building Regulations apply beyond that required by the Recast Energy Performance of Buildings Directive requirements.

Currently Building Regulations for works which are major renovations of existing dwellings are at cost optimal levels. Building Regulations for major renovations of buildings other than dwellings will be set at cost optimal levels in 2017 and for Dwellings in 2018.

3.4.1 Use of more energy efficiency appliances

Measures promoting the use of more efficient appliances in buildings include the Accelerated Capital Allowance scheme covered in Chapter 5, support for energy efficiency through purchasing by public bodies, covered in Chapter 4 and energy labelling – which is addressed in Chapter 8.

3.5 Savings arising from measures on energy efficiency in buildings

Please provide a breakdown of final and primary energy savings achieved so far by measures or groups of measures and savings expected up to 2020 (EED Article 24(2), Annex XIV, Part 2.2(a))

The primary and final energy savings achieved by measures targeted at energy use in buildings are summarised in the Table below.

Table 9: Energy Savings in buildings sector and projections for 2020

Building Sector	Primary Energy Savings (GWh, PEE)		Final Energy Savings (GWh)	
	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
2002 Building Regulations - Dwellings	1,801	1,864	1801	1864
2008 Building Regulations - Dwellings	560	675	560	675
2011 Building Regulations - Dwellings	157	214	157	214
2019 (proposed) Building Regulations - Dwellings (NZEB)	0	8	0	8
2005/2008 Building Regulations - other than dwellings	762	1,299	762	1299
Greener Homes Scheme (GHS)	119	119	114	114
Energy efficient boiler regulation	320	480	320	480
Domestic Lighting (Eco-Design Directive)	320	480	170	268
Warmer Homes Scheme (WHS)	275	355	269	347
Warmth and Wellbeing Pilot	0	23	0	22
Deep retrofit pilot	0	18	0	18
Better Energy Communities	245	581	228	543
Better Energy Homes (formerly HES)	1,018	1,354	994	1324
Major Renovations (Dwellings)	0	12	0	12
Total	5,578	7,482	5375	7189

4. Public Bodies

4.0 Overview of Central government buildings

Please provide information on the published inventory of heated and cooled central government buildings (EED Article 5(5)). Please provide details of the calculation for the renovation obligation (EED Article 5 (1-4))

The savings that paragraphs 1 to 5 of Article 5 of the EED would generate are estimated from standard values for energy consumption of reference buildings before and after renovation and according to estimates of the floor area of central government stock. The standard values are derived from the EPBD associated “cost-optimal” methodology (“Report on the Development of Cost Optimal Calculations and Gap Analysis for Buildings in Ireland under Directive 2010/31/EU on the Energy Performance of Buildings (Recast): Section 2 - Non Residential”), while the calculation methodology is based on the European Commission’s “Guidance note on Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EC, and repealing Directives 2004/8/EC and 2006/32/EC Article 5: Exemplary role of public bodies' buildings”. Under this approach, only measures concerning the building envelope, building elements and technical systems are considered. The methodology reviews a series of energy efficiency measures (fabric and system upgrades) and the reduction in energy consumption associated with each measure, on an individual elemental basis. It should be noted that this will lead to a more onerous total energy saving requirement than if entire packages of measures were calculated together.

Table 10: Calculation of target for naturally ventilated office buildings

Energy Efficiency Measure	Delivered Energy Consumption (kWh/m ² .yr)	Cost Optimal Energy Consumption with measure applied (kWh/m ² .yr)	Total Estimated surface (per 1000m ²)	Total Delivered Energy Saving (GWh)
Upgrade External Wall	256	250	335.19	2.0
Upgrade Roof	256	240	335.19	5.4
Upgrade Heating	256	224	335.19	10.7
Upgrade Floor	256	243	335.19	4.4
Upgrade Windows	256	222	335.19	11.4
Upgrade Lighting	256	233	335.19	7.7
'Denominator' under alternative approach				41.6

Table 11: Calculation of target for air conditioned office buildings

Energy Efficiency Measure	Delivered Energy Consumption (kWh/m ² .yr)	Cost Optimal Energy Consumption with measure applied (kWh/m ² .yr)	Total Estimated surface (per 1000m ²)	Total Energy Saving (GWh)
Upgrade External Wall	265	260	15.59	0.08
Upgrade Roof	265	262	15.59	0.05
Upgrade Heating	265	263	15.59	0.03
Upgrade Floor	265	253	15.59	0.19
Upgrade Windows	265	250	15.59	0.23
Upgrade Lighting	265	247	15.59	0.28
Upgrade Chiller	265	231	15.59	0.53
Upgrade Air Handling Unit	265	256	15.59	0.14
'Denominator' under alternative approach				1.53

Table 12: Calculation of total energy saving target

Reference Building Type	Total Energy Saving (GWh)
Naturally Ventilated Office Building	41.6
Air Conditioned Office Building	1.53
Total	43.09

From the above figures, the annual target will therefore be:

$3\% \times 43.09 \text{ GWh} = 1.29 \text{ GWh}$ (the estimated amount of energy that would be saved if 3% of the central government buildings were renovated to meet cost-optimal energy consumption levels).

Table 13: Total useful floor area

Reference Building Type	Floor Area (m ²)
Naturally Ventilated Office Building	335,195
Air Conditioned Office Building	15,591
Total	350,786

The Total Useful Floor Area (TUFA) of central government buildings greater than 250 m² not meeting national minimum energy performance requirements is 350,786 m². The renovation obligation for central government buildings in 2014 is thus $3\% \text{ of } 350,786 \text{ m}^2 = 10,524 \text{ m}^2$.

Under the behavioural change campaign, all central government buildings will be targeted. In line with EED Article 5(1), the poorest performing buildings will be prioritised in the campaign, where cost-effective and technically feasible.

Where applicable, please inform about the alternative approach to achieving savings equivalent to the fulfilment of the renovation obligation as allowed for in Article 5(6)

Ireland opted for the alternative approach allowed under Article 5 and submitted the report “Article 5: Exemplary Role of Public Bodies' Buildings” to the Commission in December 2013 – a copy of the Report can be accessed at www.ec.europa.eu/energy/sites/ener/files/documents/2013_ie_eed_article5_en.pdf

The Office of Public Works (OPW), whose remit includes the management and maintenance of the State’s property portfolio, is responsible for delivering the target savings under this approach.

With reference to benchmark energy consumption data, the total delivered energy consumption of the target buildings is approximately 72 GWh. Based on standard values for the energy consumption of reference central government buildings, the total energy saving that paragraphs 1 to 5 of Article 5 of the EED would generate is 1.3 GWh. This equates to an average saving of approximately 2% per annum in each building.

Energy monitoring equipment (thermal and electrical) has been installed in each applicable building. A behavioural change campaign ([Optimising Power @ Work](#)²⁸) has been rolled out into each building and currently the average annual energy savings are approximately 18%. In 2017, the Department of Communications, Climate Action and Environment has provided a €3M fund for a pilot programme to enable the OPW in partnership with the SEAI, to carry out an initial tranche of Medium/Deep Energy Retrofit projects in targeted Central Government buildings. Buildings must have achieved at least a 15% saving through behavioural change and low cost energy projects in order to gain access to the fund (see Section 8.4.2. for further details on this pilot programme). The OPW are currently identifying suitable buildings for lighting, heating and controls upgrade projects. It is intended that these works will be completed before the end of 2017. Energy savings will be monitored through the energy metering systems that have previously been installed in each building.

4.1 Purchasing by public bodies

Please provide information on steps taken to ensure that central government purchases products, services and buildings with high-energy efficiency performance (*EED Article 6(1)*), and on measures undertaken or planned to encourage other public bodies to do likewise (*EED Article 6(3)*).

The Office of Government Procurement (OGP) is involved in the centralised purchasing of a wide range of goods and services for the Irish Public Service. Since the publication of the NEEAP 3, the OGP has implemented a number of measures relating to procurement for public sector bodies including:

- Put in place framework agreements for common goods and services for use by Public Sector Bodies. Where appropriate energy efficient and environmental considerations are taken into account when implementation the agreements. The OGP’s role is to give Public Sector Bodies the choice of choosing energy efficient products / services but it is the decision of the individual Public Sector Body which product / service it chooses. The OGP have implemented a number of framework agreements which would impact on the area of energy efficiency. These would be for the purchase of white goods, standard cars and the provision of electricity.
- Through the establishment of a framework agreement for the supply of managed print services (MPS) the OGP has encouraged public bodies throughout the country to adopt an alternative approach to office printing that has resulted in moving to printing on more energy efficient equipment.

²⁸ <http://www.opw.ie/en/about/sustainability/>

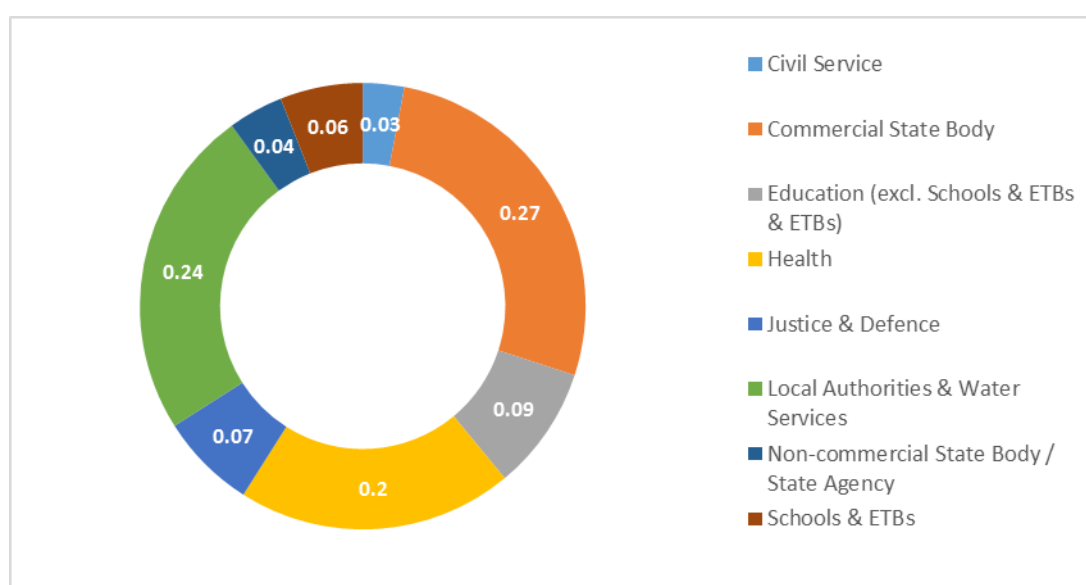
- The framework agreement for white goods states that suppliers on the framework must provide goods that are energy efficient and the majority of the goods available are “A” rated.
- The OGP have been stipulating environmental criteria in the contracts for road transport vehicles for a number of years. Most of the contracts are for passenger and light duty vehicles. 89% of the contracts used whole of life costing as the energy efficient / environmental criteria in the evaluation.
- The OGP currently procure electricity with 32.2% coming from renewable resources which is adhering to the terms of the National Renewable Energy Action Plan. Individual Public Sector Bodies can request that their electricity supply comes from 100% renewable resources and to date two Public Sector Bodies has availed of this. Currently, two of the OGP’s suppliers on the Electricity Framework supply electricity only from renewable resources (Airtricity & Energia). At time of publication, both suppliers supply 51 public sector bodies.

The Accelerated Capital Allowance (ACA) scheme introduced under the 2008 Finance Act is a tax incentive scheme for organisations to purchase highly energy efficient equipment that allows them to deduct the full cost of the eligible equipment from taxable profits in the year of purchase rather than over the usual eight year period. Under Regulations introduced in 2011 ([European Union Energy Efficient Public Procurement Regulations, SI 151 of 2011](#)²⁹), public bodies are obliged to procure only equipment which is (a) listed on the Register or (b) satisfies the published SEAI energy efficiency criteria for the equipment. More information on the ACA scheme can be found in Section 5.1.5. *Accelerated Capital Allowance/Triple (Energy Efficient Equipment)*.

4.2 Energy Efficiency in the Public Sector – Ireland’s Strategy

To emphasise its leadership and exemplary role the Irish Government set a more ambitious energy efficiency target of 33% for the Public Sector. Public sector bodies are required to report annually on their energy usage. The breakdown of energy usage across the public sector is shown in the diagram below.

Figure 3: Total primary energy consumption reported for 2015



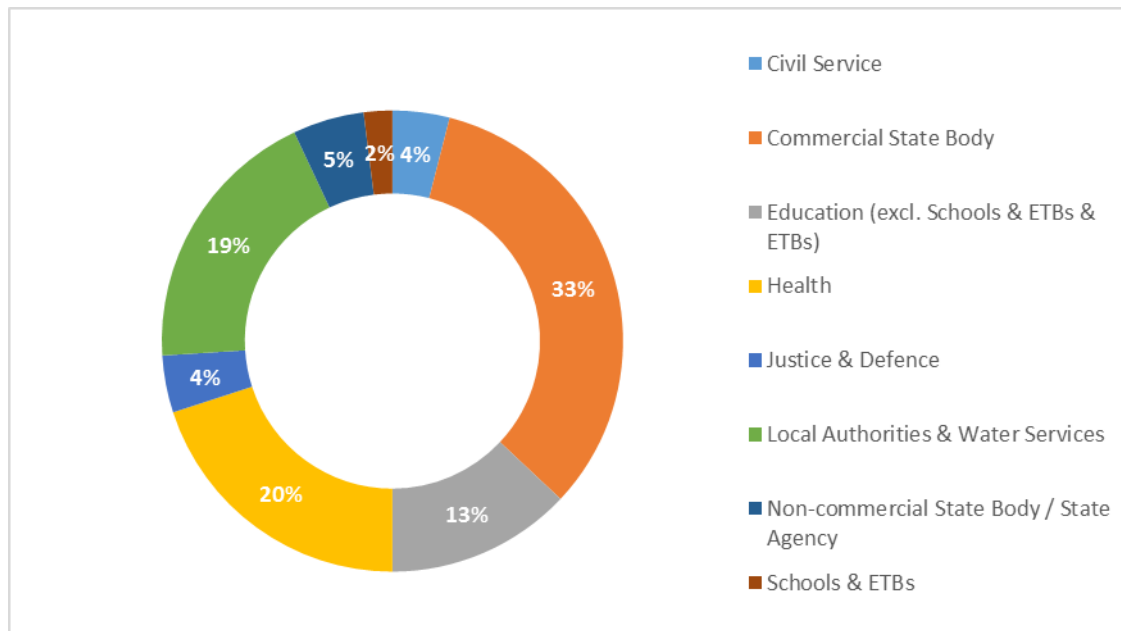
*Source SEAI’s Annual Report 2016 on Public Sector Energy Efficiency Performance³⁰

²⁹ <http://www.irishstatutebook.ie/eli/2011/si/151/made/en/pdf>

³⁰ SEAI’s Annual Report 2016 on Public Sector Energy Efficiency Performance can be accessed at http://www.seai.ie/Publications/Your_Business_Publications/Public_Sector/Annual-Report-2016-on-Public-Sector-Energy-Efficiency-Performance.pdf

By the end of 2015 – the latest period for which measured figures are available – public sector bodies had reported energy efficiency improvements amounting to 21% - 2,442 GWh. The breakdown for this is shown in the diagram below.

Figure 4: Sources of energy savings



**Source SEAI's Annual Report 2016 on Public Sector Energy Efficiency Performance*

In December 2016 Ireland's first [Public Sector Energy efficiency Strategy](#) was approved by Government and public sector bodies have been mandated to implement its provisions. The Strategy, developed in consultation with public sector stakeholders, recognizes that for the target to be met a further prioritisation of energy management would be needed. The Strategy identifies where further potential for savings exist and provides guidance on effective approaches to energy management as well as case studies of successful approaches. It outlines the range of supports available to public sector bodies and makes provision to further enhance those supports. One of the key provisions of the strategy is a new governance structure which includes the designation of a senior official in each body – Energy Performance Officers - to be responsible for achievement and reporting on energy management objectives. An overseeing steering group will work with senior managers to identify a further project pipeline starting with larger energy users.

Public Lighting is one of a range of measures that are important to achieve Ireland's energy efficiency objectives in the public Sector. Potential for public lighting is significant and all local authorities are co-operating and working on a co-ordinated basis through a national Steering Group whose objective is the upgrade of the public lighting stock to achieve the national public sector energy efficiency target. An asset inventory has been developed and approaches to delivering and financing the upgrade are being explored.

The wider range of measures and actions being taken to achieve the public sector energy efficient target which is expected to deliver approximately 10% of Ireland's overall NEEAP target for 2020 is set out in the [Public Sector Energy Efficiency Strategy](#).

4.3 Supports to the Public Sector

The SEAI has operated a public sector programme for a number of years, which provides supports to the entire public sector. There are 4 elements to the programme:

Partnership – CEO level commitment to the public bodies NEEAP obligations, with a specific commitment to implementing a structured Energy Management Programme, purchasing obligations and annual reporting to SEAI. The organisations have two Energy Management Tools they can implement - Energy MAP or ISO 50001. Under each approach, an annual energy action plan is required.

http://www.seai.ie/Your_Business/Public_Sector/Partnerships/ The more the organisation commits, the more services it can draw down. To date, there are 82 partners accounting for 75% of PS electrical consumption. These partner organisations receive extensive support from SEAI to through mentoring, advice, consultancy support etc..

An additional support programme put in place during 2015 was an ISO50001 Accelerator Programme. This is a set of Masterclasses, with mentoring support, to facilitate large public bodies achieve certification to the International Energy Management Standard ISO50001.

Best Practice – SEAI created “Energy Link”, an online forum exclusive to public bodies. There were 1300 members as of March 2017, with specialist groups on such topics as ESCOs, public lighting, buildings, awareness etc.. SEAI runs a number of workshops and training sessions on different topics requested by members. For example a total of 70 workshop and training sessions were undertaken during 2016 for public bodies with approximately 1,500 people attending. For 2017 SEAI is focusing on the development of a project database with case stories. Guidance is also provided to schools such as the [short video](#)³¹ on top 10 energy saving tips to reduce school energy consumption.

Procurement and funding – the Irish policy document ‘Green Tenders’ presents a framework for procuring energy, equipment, services or capital projects that will use energy. Implementation on the ground is supported by the Partnership and Best Practice elements.

DCCAE and SEAI developed the **National Energy Services Framework**, which provides a best practice approach to implementing energy efficiency projects, and provides different contracting options, including EPC. DCCAE also established the **Energy Efficiency Fund**, to provide a source of finance to public and private projects. http://www.seai.ie/Your_Business/National_Energy_Services_Framework/.

Monitoring and Reporting – SEAI hosts an online reporting tool to track public bodies progress towards the NEEAP targets. Public bodies insert their electrical and gas meter numbers and SEAI determines the annual consumption for these energy uses. The database contains 40,000 meter numbers and is growing daily. Each public body receives a scorecard to show their progress, a version of which will be published. In 2016 a total of 337 public bodies (96%) and 1,742 schools reported energy performance data to SEAI.

Optimising Power @ Work - The Office of Public Works’ (OPW) state-wide staff energy conservation campaign, *Optimising Power @ Work*, has been expanded into the wider public sector. The core principle of *Optimising Power @ Work* is to intensively work with staff to encourage behavioural change with regard to energy usage, with the overall aim of identifying and eliminating energy wastage. The programme offers three key supports:

³¹ <https://vimeo.com/51626564>

- **Technology:** Installation of dedicated Energy Monitoring Systems (EMS) to record energy consumption data in each building, and provide live and up to date energy data.
- **Specialist Expertise:** Appointment of an Energy Advisor to each building, who assesses baseline energy performance, sets energy saving targets and measures progress towards these targets.
- **Staff Engagement:** Intensive engagement with staff and energy teams to create awareness and promote behavioural change.

Currently there are over 300 Central Government buildings participating in the campaign. Since the expansion into the wider public sector the programme now also includes: prisons (9), large acute care hospitals (16), 3rd level education facilities (7) and local authorities (10). The OPW will continue to expand *Optimising Power @ Work* into suitable public sector organisations

4.4 Savings from measures in central government and other public bodies

Please provide, for all measures addressing energy efficiency in central government and in all other public bodies, a breakdown of achieved savings and savings expected up to 2020 by measure or by groups of measures (EED Article 24(2), Annex XIV Part 2.2(a) and (b))

The primary and final energy savings from measures targeted at energy use in the public sector are summarised in the table below.

Table 14: Energy savings achieved from public sector measures

Public Sector	Primary Energy Savings (GWh, PEE)		Final Energy Savings (GWh)	
	2016 (achieved)*	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
Public Sector	2,195	2,795	1784	2303

* Accounting for savings in the public sector has now been aligned with the Public Sector Monitoring & Reporting (M&R) initiative which measures actual impact achieved based on detailed reported data. A breakdown of savings for a range of sub-measures is provided in the Appendix. As the M&R system captures all energy savings achieved in the public sector since 2009, the savings for the sub measures which are a sub-set of the overall impact achieved is provided for information only. Table 14 shows the assessment based on modelled savings for 2016 – excluding those savings that are accounted for under Chapter 6 (Energy Network) to ensure no double counting occurs with regard to public sector energy savings. The 2015 public sector efficiency savings figure cited elsewhere in this document of 2,442 GWh is based on total actual reported efficiency gains which include network efficiency savings.

5. Commercial Sector

5.1 Industry programmes

Please provide details on all measures addressing energy efficiency in industry (EED Article 24(2), Annex XIV Part 2.2)

5.1.1 Energy audits and management systems

Please provide an overview of measures planned or already undertaken to promote energy audits and energy management systems, including information on the numbers of energy audits carried out, specifying those carried out in large enterprises, with an indication of the total number of large companies in the Member State territory and the number of companies to which Article 8(5) is applicable (EED Annex XIV Part 2.3.3)

A strong energy management culture has developed in Ireland – particularly for larger commercial entities. This has evolved through providing support and networking programmes for large industry and adopting energy management standards. Smaller organisations are now adopting a similar approach and we are mindful of our responsibilities under the EED to promote the availability of quality energy audits to final customers, ensuring mandatory and regular audits for large enterprises and developing programmes to encourage small and medium enterprises (SMEs) to undergo energy audits and most importantly, implementing the resulting recommendations as appropriate. Achieving these objectives is important in terms of reducing energy costs for consumers and businesses alike.

The SEAI have put in place a framework which is the underpinning mechanism for companies to comply with audit requirements of Article 8 of the Energy Efficiency Directive – this is called the [Energy Audit Scheme](#)³² (EAS). This scheme sets out the rules for compliance including the standards of training and qualification for energy auditors to register for the scheme, extensive guidance for companies on audit standards and interpretation of the legislation as appropriate. As of March there were 100 auditors registered to complete or sign off on audits for the purposes of compliance with Article 8 and 309 audits had been completed. It is difficult to indicate with certainty the number of large companies/organisations that should undertake audits but it is estimated that the requirement could apply to up to 600 entities. The number of auditors registered and audits conducted will be updated on the [SEAI web page](#) on an ongoing basis.

SEAI has also developed an [Energy Audit Handbook](#)³³ (published in April 2017). This is a comprehensive best practice manual as an additional support to business and industry for both auditors and organisations of all sizes having audits undertaken or as a guide to identifying opportunities for improved energy efficiency.

In addition there is an interactive SME guide which will be added to this suite of supports. This toolkit (also due for publication April 2017) is for the smaller organisation starting on the road of energy efficiency and energy management. Both of these resources are strong additions to the promotion work that SEAI undertakes to encourage and support businesses, both large industry and smaller enterprises, to engage in energy management.

The current focus with SME sector is training and best practice supports. Training on EnergyMAP, which comprises three days training over a three month period with some mentoring support, is available free of charge to SMEs. For companies at the smaller end which energy bills less than €100,000 the time requirement is reduced further to three half days.

³² http://www.seai.ie/Your_Business/Energy-Auditing-Scheme/

³³ http://www.seai.ie/Publications/Your_Business_Publications/Large_Energy_Users/SEAI-Energy-Audit-Handbook.pdf

5.1.2 Large Industry C2

The Large Industry Energy Network (LIEN) is a voluntary grouping, facilitated by the Sustainable Energy Authority of Ireland (SEAI), of companies that work together to develop and maintain robust energy management. More information is available at: http://www.seai.ie/Your_Business/Large_Energy_Users/LIEN/#sthash.J9Db4Ebt.dpuf. The network now comprising 192 Irelands largest energy users and accounting for 19% of TPER and 55% of Industrial TPER, provides sharing of best practice and case studies. Information seminars are organised on a regular basis to build capacity and exchange new learning and approaches to reducing energy consumption.

The SEAI Energy Agreements Programme is a sub-set of 80 LIEN companies, who have agreed to work towards implementing ISO 50001. In return, they receive tailored support from SEAI in the form of assigning an Agreements Support Manager to provide both general and technical advice; assessing any gaps in order to achieve ISO50001; identifying special investigations to reveal opportunities for energy savings; organising tailored workshops, training and networking events.

SEAI has also developed an [Energy Audit Handbook](#) - a comprehensive best practice manual for both auditors and organisations of all sizes having audits undertaken which is an additional support to business and industry.

Combined Heat & Power (CHP) technology combines the generation of electricity at a local level with the use of heat for process use and/or space heating. CHP technology provides distributed power generation reducing the reliance on the national electricity grid. It is also a highly efficient use of energy in particular when using natural gas and offers substantial savings when compared to grid electricity. Applications of CHP technology range from smaller users such as nursing homes, hospitals and hotels up to large industrial applications such as data centres, dairy processing plants and the pharmaceutical sector. Key benefits include improved energy efficiency, security of supply of onsite generation, as well as the financial benefits of on-site electricity generation due to the cost differential between generating electricity onsite and electricity purchased from the grid. The promotion of CHP for small to large Industrial and Commercial premises could result in significant energy efficiency improvements for Ireland.

5.1.3 SME Supports C3

Please provide information on measures adopted or planned to promote and facilitate efficient use of energy by SMEs and domestic customers (EED Article 132, Article 17 Annex XIV Part 2.2)

SEAI has engaged with over 3,000 SMEs, providing strategic support, training funding, and advice for energy projects. The current focus with SME sector is training and best practice supports. Training on EnergyMAP, which comprises three days training over a three month period with some mentoring support, is available free of charge to SMEs. For companies at the smaller end which energy bills less than €100,000 the time requirement is reduced further to three half days. More information available at [SEAI - Training³⁴](#).

In addition there is an interactive SME guide which will be added to this suite of supports. This is a toolkit for the smaller organisation starting on the road of energy efficiency and energy management (also due for publication April 2017). This resource, combined with the Energy Audit Handbook referenced above are strong additions to the promotion work that SEAI undertakes to encourage and support businesses, both large industry and smaller enterprises, to engage in energy management.

³⁴ http://www.seai.ie/Your_Business/Business_Training/

SEAI provides advice and training for SMEs through a number of different supports:

Best Practice Supports

Small commercial energy users can avail of SEAI's best practice material. There is a series of practical guides and case studies available on the SEAI website and SEAI provides a range of Applied Training Courses for varying business needs:

- Businesses interested in training can work with their trade representation body, which can coordinate training offered via SEAI.
- Businesses without a trade representative body, or individuals can register their interest using the online form at http://www.seai.ie/Your_Business/Business_Training/

Small business training

Businesses with a total energy spend of less than €100,000 per year can avail of three half-day workshops over 10-12 weeks and tuition in SEAI's online tools and access to best practice. See more at: http://www.seai.ie/Your_Business/Business_Training/SmallBusiness_Training/#sthash.nz7l8eIG.dpuf

EnergyMAP Training

Businesses with a total energy spend of more than €100,000 per year can avail of three full-day workshops and on-site support from energy advisors. See more at:

http://www.seai.ie/Your_Business/Business_Training/EnergyMAP_Training/#sthash.0n4eiV67.dpuf

Recognising the importance of facilitating competition in the market and the potential contribution of competition to drive further efficiencies the CER also provides a dedicated energy customers team and website resource for consumers who have questions about their electricity, gas supply or water supply, are looking for advice on switching or wish to make a complaint³⁵.

5.1.4 Energy Services - National Energy Services Framework

Please provide information on measures adopted or planned to be adopted for the promotion of energy services. The description should include a hyperlink to the list of available energy service providers and their qualifications (EED Annex XIV Part 2.3.8)

Please provide a qualitative review of the national market for energy services describing the current status and outlining future market developments (EED Article 18 (1e))

The Department of Communications, Climate Action and Environment, with SEAI, has developed a National Energy Services Framework to help stimulate the energy-efficiency market in the non-domestic sector³⁶. This Framework sets out the roadmap for energy efficiency projects to follow and specifically how an Energy Performance Contracting approach can be built in.

The Framework provides, for public sector and commercial organisations, a standard and structured approach, supported with a suite of tools including comprehensive guidance documents, templates, model contracts, monitoring and verification requirements to support the efficient procurement and delivery of energy efficiency projects on the ground. The provision of such a standard approach is to provide confidence, build the knowledge base and reduce transaction costs while building capacity in the market.

³⁵ <http://www.cer.ie/customer-care>

³⁶ http://www.seai.ie/Your_Business/National_Energy_Services_Framework/

The appetite for this type of contracting is still low and for many organisations moving from a traditional approach to procuring and financing large energy projects to Energy Performance Contracting approach is too big a step. For this reason the Framework includes, and encourages all clients, to integrate an energy performance related payment into contracts. This is often a means of ‘testing’ the approach, build confidence before moving to full energy performance contracting.

There is Project Assistance Grant support available from SEAI which assists with the preparation of a business case and progressing with EPC or EPRP approaches offsets the additional transactional costs that are often associated with legal, financial and technical advice which can be viewed as a barrier.

The [Register of BER Assessors \(Domestic, Non-domestic and DEC Assessors\)](#) , [National Register of Energy Auditors](#)³⁷ and Register of Contractors (residential) [Register of Contractors \(Residential\)](#) are available on the SEAI website.

5.1.5 Accelerated Capital Allowance/TripleE (Energy Efficient Equipment) C1

The Accelerated Capital Allowance for Energy Efficiency Equipment (ACA), introduced in 2008, aims to improve the energy efficiency of Irish companies by encouraging them to purchase energy saving technologies and equipment. The scheme offers a tax incentive for companies who invest in highly efficient equipment to avail of tax breaks by allowing such businesses deduct the full cost of such equipment from taxable profits in the year of purchase rather than over the usual ‘Wear and Tear’ eight year period.

The scheme was introduced under the 2008 Finance Act for a trial period of three years and in 2011 was extended to 31 December 2014. The ACA scheme was again reviewed in 2014¹⁸ with the successful extension of the scheme to 2017. The scheme has expanded and 52 technologies with over 17,400 products currently listed. The expansion of the ACA programme in Budget 2017 to include non-corporates and sole traders provides an increase in future growth potential.

ACA eligible products are listed on [SEAI’s Triple E \(Energy Efficient Equipment\) Register](#)³⁸ which provides a benchmark register of best in class energy efficient products. In addition to the ACA, this register is used to fulfill requirements of the European Communities (Energy Efficient Public Procurement) Regulations (S.I. No. 151 of 2011). These Regulations oblige public bodies, when purchasing or leasing categories of products that are listed on the Triple E Register, to procure only products that meet SEAI’s energy efficiency criteria. SI 646 of 2016 (Regulation 5) restates the requirement for public bodies to purchase from the Triple E Register. Both the ACA and Triple E are managed by SEAI. Further information on the schemes, including a full list of categories, technologies and eligible products, can be found on SEAI’s website³⁹.

5.2 Savings arising from industry measures

Please provide a breakdown of savings achieved and savings expected up to 2020 by measure or by groups of measures (EED Article 24(2), Annex XIV Part 2.2 (a) and (b))

The primary and final energy savings achieved by measures targeted at energy use in the commercial sector including industry and small and medium enterprises and projections for 2020 are set out in the table below.

³⁷ http://www.seai.ie/Your_Business/Energy-Auditing-Scheme/EAS-22-03-17.pdf

³⁸ http://www.seai.ie/Your_Business/Triple_E_Product_Register/

³⁹ http://www.seai.ie/Your_Business/Triple_E_Product_Register/About/

Table 15: Energy savings from commercial (including industry) measures

Commercial including Industry	Primary Energy Savings (GWh, PEE)		Final Energy Savings (GWh)	
	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
SEAI Large Industry Programmes	2,074	2,300	1686	1895
SEAI SME Programme	194	230	157	189
ACA (private sector)	368	688	196	385
SEEEP and EERF (private sector)*	177	177	144	146
CHP (private sector)*	368	428	368	428
ReHeat (private sector)*	288	288	288	288
Better Energy Workplaces (private sector)*	274	274	223	226
Total	3,744	4,384	3062	3556

* Indicate measures that have made a contribution to NEEAP targets but are no longer active.

6. Energy Supply

6.1 Metering and billing

Please provide information on measures adopted or planned in metering and billing (EED Article 9, Article 10, Article 11, Annex XIV Part 2.2)

The Commission for Energy Regulation's (CER) primary economic responsibilities in energy is to regulate the Irish electricity and natural gas sectors. This includes electricity generation, electricity and gas networks, and electricity and gas supply activities. In particular the Regulator oversees and regulates the electricity and gas retail markets, licenses and energy suppliers. The CER is also responsible for the National Smart Metering Programme (NSMP).

6.1.1 Frequency and type of billing information

Competitively priced meters

The network companies install and procure the gas and electricity meters. In doing such they must adhere to all relevant laws (e.g. procurement law) and determinations (this is a licence condition). The revenues of the network companies are regulated by the CER and as such the CER approves the revenues associated with the purchase of meters. The CER only allows efficiently incurred costs. The CER approves the charges for all meter works including meter replacement. These charges are set out in the relevant Statement of Charges.

The CER has Service Level Agreements (SLA) in place with the Network Operators structured around 4 actual meter reads per annum (2 additional estimated reads are also conducted). In addition, customers can submit their own meter reads (customer reads). These customer meter reads are subject to validation criteria to ensure accuracy and eliminate erroneous meter reads. Where they pass this is taken as an actual read. Under the Supplier Handbook, suppliers are required to ensure that customers receive prompt and regular scheduled bills for their electricity and gas usage, as per the terms and conditions of their contract. In addition, suppliers are required to issue scheduled bills to customers no later than one month after the receipt of scheduled meter reading data.

The Supplier Handbook imposes requirements on suppliers in relation to the information they must include on the energy bills and the format in which this information must be presented. For example, the energy bills must include the period to which the bill relates, the date of issue of the bill, the date upon which the payment is due, tariff name and category, meter readings upon which the bill is based, including an indicator showing whether the meter reads are actual, estimated or self-reads, clear calculation of the amount due for electricity /gas supplied.

As part of the Supplier Handbook, suppliers are required to ensure that customers receive prompt and regular scheduled bills for their electricity and gas usage, as per the terms and conditions of their contract. In addition, suppliers are required to issue scheduled bills to customers no later than one month after the receipt of scheduled meter reading data for the billing period involved and provide clear and understandable explanation of how bills were derived.

The Supplier Handbook requires specific information to be placed on the bill (that is a minimum set of information that must be included). For example, the following information must be placed on the front page of the bill in a manner that allows the customer to find it easily:

1. Electricity Network Operator/Gas Network Operator's emergency/fault reporting contact number
2. Meter/Gas Point Registration Number (MPRN/GPRN)
3. Distribution Use of System (DUoS) Category Code (Electricity customers)
4. Metering Configuration Code (Electricity customers)
5. Profile Code (Electricity customers)
6. Meter Number (Non-Daily Metered (NDM) Gas Customers)
7. AC Band (Gas Customers)

In addition to requirements for minimum information included in the bill, the Supplier Handbook sets out specific requirements in relation to the format for presentation of promotional offers, estimates etc. to customers. For example, when presenting information on tariffs, a supplier must:

- display tariffs inclusive and exclusive of VAT on a per unit basis
- show annual standing charges as an annual amount inclusive and exclusive of VAT
- show discounts measured off the standard rate tariff for that supplier
- where a supplier compares its tariffs to competitors' tariffs, information must be dated to show when all tariffs presented were in place, comparison must be made on a like for like basis and customers must be made aware that the competitor's tariffs are subject to change.

Also, suppliers are required to notify customers of the tariff options available to them if applicable in advance of any tariff change or in line with the customer contract, whichever is the shortest period of time. Changes in tariffs will be clearly indicated on the bill and the method of application will be explained on the bill or in an accompanying insert (this may be an electronic notice where a customer has chosen this method of billing).

The roll-out of smart meters is being progressed under the National Smart Metering Programme and is discussed in more detail in the following section.

6.1.2 Smart Metering E1

The National Smart Metering Programme is a central component of the strategy to radically enhance management of energy demand, deliver smart networks and enable greater energy efficiency through the use of cutting-edge technology. It is also in line with EU requirements where Member States are obliged to progress smart metering. A major programme of technology and user trials showed that a national rollout of Smart Meters could lead to reductions in overall electricity and gas consumption, as well as an 8.8% reduction in peak-time electricity consumption. Following the successful completion of these exploratory trials, a decision to proceed to the second phase of the National Smart Metering Programme was taken in July 2012. Work has been ongoing in the planning phase of the programme including the high level design and industry engagement. Various complexities have contributed to some delays and the CER undertook a replan of the programme in the latter half of 2016. The outcome of that replan is now being finalised with a view to the outline of a final timeframe. Realistically a go-live date for smart services and meter installation will not be in place until post 2020.

Please inform if network tariffs support the development of demand response services (*EED Annex XI 3.*)

Currently, there are no elements of network tariffs which support the development of demand response services, although the Transmission Grid Code and Distribution Grid Code working parties are considering the issue.

The current DUoS tariff structure supports network access for a range of different user types and the network operator has contributed to the design of tariffs as part of the ongoing consultations on Smart Metering. Ongoing development and management of the DUoS Groups will be conducted in conjunction with the NSMP and in consultation with CER as appropriate.

The system of Generator-Tariffs used on the island of Ireland is locational in nature. As a result, participants who drive the need for additional deep reinforcements of the network infrastructure pay higher tariffs than those who don't. In the event that demand response participants are to be treated similarly to generators with regard to tariffs, and where demand response participants are reducing or negating the need for deep reinforcements, then this would be reflected in any generator-charges that they face. The review by the European Commission of tariffs may impact on this. Ireland will participate fully in this process, as with the network codes negotiated at the Electricity Cross Border Committee.

6.2 Energy transformation, transmission, distribution and demand response

6.2.1 Energy efficiency criteria in network tariffs and regulation

Please describe planned or adopted measures to ensure that incentives in tariffs that are detrimental to the overall efficiency (including energy efficiency) of the generation, transmission, distribution and supply of energy, or might hamper participation of demand response in balancing markets and ancillary services procurement, are removed (*EED Article 15(4), Annex XIV Part 2.2 first sentence*).

Transmission and Distribution tariffs are location-based i.e. costs are reflective of distance from demand and strength of network. This provides a price signal to generators to build new generation close to sources of demand and thus reduce transmission losses.

Transmission Loss Adjustment Factors are also location-based. This provides a price signal to generators to build new generation close to demand centres or close to the stronger elements of the network, thus reducing transmission and distribution losses and increasing efficiency.

There are already a number of incentives built into the tariff design in Ireland to promote the overall efficiency of the energy system. The Transmission Use of System (TUoS) charges, which are charges for the provision of access to the transmission network to transfer energy for trade in the market, are applied according to size (i.e. larger users pay more in tariffs) and location (i.e. generators should pay more to contribute to the cost of the reinforcement which their connection has caused). The objective of the transmission tariff arrangements is to provide locational signals to users that reflect the costs that they impose on the transmission system. On the basis of these price signals, users can make informed decisions concerning their use of the transmission system.

The TUoS charging arrangements reflect transmission investment costs based on system usage. Each Generator's TUoS charge is designed to be reflective of transmission investment costs associated to its own

use of the system. Generators that drive the need for additional investment pay higher tariffs. This tariff design aims to promote a more efficient development and use of the transmission system.

Please describe planned or adopted measures to incentivise network operators to improve efficiency through infrastructure design and operation (*EED Article 15(4), Annex XIV Part 2.2. first sentence*).

The Regulator has put in place, in its fourth Price Review (PR4) incentives on the TSO and ESB as the Transmission Asset Owner (TAO) to demonstrate to the CER, utilising an economic cost-benefit analysis, that a policy or design improvement introduced resulted (or will result) in a quantifiable benefit to the electricity consumer. The activities include transmission efficiency measures.

In addition, the Network Operator is incentivised under the PR4 determination to reduce network losses. The Network Operator conducts annual reviews of Network Losses and reports on these reviews to CER.

The following sample measures have been undertaken to reduce network losses and increase system efficiency:

- i. 10kV to 20kV network conversion**
- ii. Installation of low loss network components – hexaform transformers**
- iii. Network refurbishment – conductor replacement, transformer upgrades etc.**

The DSO is continually optimising asset replacement and investment plans to minimise losses on the distribution system.

One element of the PR4 is the adoption of an incentive-based approach for the TSO's and TAO's allowed revenues. Under the *ex- ante* incentive based revenue cap regime, the CER fixes the internal operating costs for both TSO and TAO for a five year period. If the TSO or TAO spends more than allowed, the utility bears the cost. If less money is spent, it is allowed to keep the surplus made in any one year for a period of five years as a means of incentivising efficiencies. In taking this approach the customer benefits in the medium term by the progressive decrease in operating costs allowed at subsequent price reviews. Each price review is based on the revenues/costs of the previous period. Efficiencies should be derived from internal business practices and procedures.

In addition to this general incentive to ensure only efficient levels of cost are faced by customers under the revenue cap mechanism outlined above the CER has also put in place a series of performance and outcome based incentives to ensure quality of service and supply are maintained and desired outcomes delivered. This suite of performance incentives covers traditional system performance measures as benchmarked internationally and also provides for incentives/ penalties to apply relating to the delivery of identified grid infrastructure requirements.

The proposed Framework Guideline on investment incentives could have the potential to incentivise network operators to improve efficiency when taken together with the Projects for Common Interest under the 10 Year Network Development Plan. As the framework guideline is not yet published it is too early to determine the extent to which this is the case.

Please describe planned or adopted measures to ensure that tariffs allow suppliers to improve consumer participation in system efficiency including demand response (*EED Article 15(4), Annex XIV Part 2.2. first sentence*).

A number of measures are underway - including in the area of Demand-Side Units (DSUs and Smart Metering - to ensure that tariffs allow suppliers to improve consumer participation in system efficiency.

At the moment, the focus of DSU aggregators is primarily on large scale industrial customers. Dispatch instructions are issued by the TSO at an aggregate level and the DSU Aggregator then coordinates the reduction from the Individual Demand Sites. With the advent of smart meters and home energy management systems the scope of DSUs to include smaller industrial and domestic customers will increase.

In addition, a considerable amount of work in the area of System Services has been undertaken as part of the Delivering a Secure and Sustainable Electricity System (DS3), with further information as provided below.

6.2.2 Demand Response

Please provide information on measures adopted or planned to enable and develop demand response, including those addressing tariffs to support dynamic pricing (*EED Annex XI 3., Annex XIV Part 2.3.6., EED Article 15(4), Article 15(8)*).

Demand Side Management (DSM) has been a feature of the Irish and Northern Irish transmission systems for a number of decades. The types of DSM in operation at the moment are:

- **Demand Side Units:** a DSU consists of one or more individual demand sites that can be dispatched by the TSO as if it was a generator. A DSU Aggregator may contract with these sites and aggregate them together to operate as a single DSU. Dispatch instructions are issued by the TSO at an aggregate level and the DSU Aggregator then coordinates the reduction from the Individual Demand Sites.
- **Powersave:** this scheme encourages large and medium sized customers to reduce their electricity demand on days when total system demand is close to available supply. In return, participating customers are made payments on the basis of kWh reductions
- **Short Term Active Response (STAR):** in this scheme electricity consumers are contracted to make their load available for short term interruptions. This service provides the TSO with reserves that are utilised in the event of the loss (tripping) of a large generating unit.
- **Static Time of Use Tariffs:** schemes are in place in Ireland (Night Saver Electricity) which offer a static discounted ToU tariff to encourage customers to run electrical heating (such as storage heaters) during the night.

EirGrid and ESB Networks (ESBN) are supporting the large scale penetration of DSM (from domestic to industrial customers), through initiatives such as the DS3 programme (DSM workstream), SmartGrid Demonstration Projects, Smart Metering and Electric Vehicles. The TSO in Ireland is currently conducting a trial of domestic customer activated demand side response "Power off and Save"⁴⁰ which is analysing consumer participation in demand side activity.

The level of DSU penetration has increased in the Single Electricity Market over recent years. Currently there is 327MW of demand side registered in the market (ROI). EirGrid and ESBN will continue to work with the industry to achieve DSU penetration targets of 500 MW by the end of 2020.

The Distribution System Operator (DSO) has addressed DSUs in the Distribution Code and there are now DSU representatives on the Distribution Code Review Panel (DCRP). The capabilities and operational capacities and connection requirements to facilitate DSU connection to the distribution network have been publicly consulted on and clearly set out in the Distribution Code⁴¹ (DCC9.9). Instruction Sets which detail the operational limitations that the DSO advises to the Transmission System Operator (TSO) are set on an annual basis in Q2 every year.

⁴⁰ <http://www.eirgridgroup.com/how-the-grid-works/innovation/>

⁴¹ <http://www.esb.ie/esbnetworks/ga/downloads/Distribution-Code.pdf>

The TSO has established a Grid Code working group to put in place enduring provisions to facilitate connection and operation of DSUs. The TSO has already passed Modification Proposal ID 24042 which was part of a broad review of the Transmission Grid Code to facilitate the connection and operation of DSUs. The Grid Code review panel also has representatives of the DSU sector in its membership.

ESB Networks has initiated a project called IVADN – Integrated Vision for an Advanced Distribution Network – which will aim to complement DS3 and deliver additional network efficiency. Changes to the Distribution Code are ongoing to make DSUs more effective. Distribution Code changes are presented to CER by the Distribution Code Review Panel for approval. Similar changes were made to the Grid Code to increase the effectiveness of Demand Side Units.

6.2.3 Demand Side Management Benefits

The Regulatory Authorities (RAs) in the Republic of Ireland and Northern Ireland recognise the potential which demand side management has to deliver significant economic and environmental benefits to the All-Island market. Benefits of demand side participation include:

- the potential to reduce the need for building additional plant
- being able to increase demand in off-peak periods and especially at times of high wind availability, when increasingly there will be times at which not all of the wind on the Island can be accommodated
- the ability to move load at relatively short notice in response to changing wind conditions, in order to avoid generator part-loading and unit starts, which otherwise would increase
- demand side services will be increasingly valuable as thermal generation is squeezed from the merit order and the cost of provision of frequency response and similar ancillary services increases
- demand side can mitigate transmission constraints, which are expected to increase.

In May 2011, the RAs published a decision paper on its review of demand side management in the SEM. That decision paper set out the RAs' assessment of the merits of different demand side management options, the associated development of a Demand Side Vision for 2020, and the identification of supporting policy measures and their implementation path to enable the 2020 Demand Side Vision to be delivered.

6.2.4 Examples of Demand Side Initiatives

Electricity consumers providing the **Short Term Active Response (STAR)** service can expect 10 to 20 unplanned and instantaneous interruptions per annum of some, or all, of their load. Interruptions are typically of the order of 5 minutes duration and no prior notice is given before an interruption. The cost of installing metering, communications and control equipment is paid for by customers participating in the scheme. In return for providing this service, the TSO makes payments to customers based on the energy that they make available for interruption.

The objective of the **Powersave** scheme, also managed by EirGrid and approved by the CER, is to encourage large and medium sized customers to reduce their electricity demand on days when total system demand is close to available supply. In return, participating customers are paid based on kWh reductions achieved during a Powersave Event. A Powersave Event may be called on any business day of the year and for any time of day. The charges and terms and conditions of these two schemes are approved by the Commission for Energy Regulation.

⁴² <http://www.esb.ie/esbnetworks/ga/downloads/Distribution-Code.pdf>

The network operator has proposed a research and development project on electric vehicles and their impact on the distribution system. The proposed project will focus on the impact of electric vehicles on the distribution system from a demand side management perspective, along with considerations such as the impact on safety, security and reliability of the system.

The National Smart Metering Programme is a central component of strategy to radically enhance management of energy demand, deliver smart networks and enable greater energy efficiency through the use of cutting-edge technology – it is described further at section 6.1.2.

6.2.5 System Services

A considerable amount of work in the area of System Services has been undertaken as part of the DS3 programme⁴³. One of the key work streams in the programme is the Review of System Services (or Ancillary Services). The aim of the review is to put in place the correct structure, level and type of service in order to ensure that the system can operate securely with higher levels of wind penetration (up to 75% instantaneous penetration).

To meet binding EU renewable target obligations by 2020 (which translate to 40% of electricity consumption from wind generation), the power system of Ireland and Northern Ireland is fundamentally changing. In particular, it has been established that it is necessary to operate the power system with up to 75% of instantaneous demand being met from windfarms by 2020. To manage this challenge a pioneering set of technical analyses combined with an industry-wide programme of work was initiated in 2011 and is still on going. This “Delivering a Secure Sustainable Electricity System (DS3)” programme comprises policymakers, regulators, transmission and distribution system operators, as well as key industry stakeholders. One of the fundamental areas of the DS3 programme is DS3 System Services (ancillary services), under which the Regulatory Authorities and TSOs in Ireland and Northern Ireland are engaged in a major transformation of the supply and utilisation of ancillary services on the island of Ireland.

A transition from 7 ancillary services to 14 “System Services” is currently in progress to facilitate secure system operation while integrating significant levels of renewable energy onto the Irish grid. At present Ireland is the European member state which has the highest levels of non-synchronous generation integrated into a single synchronous grid area, and is leading the way in terms of development of new ancillary services. While primarily aimed at facilitating the introduction of significant levels of renewable energy into the Irish grid, the DS3 programme also includes the development of financial incentives for better plant performance, and the development of operational policies and system tools to use the portfolio to the best of its capabilities.

Up until (and including) 2015 the TSOs procured ancillary services on a bilateral contract basis with individual generators. The DS3 System Services programme went live in 2016 and utilised an open tender tariff-based procurement process for the procurement of 11 System services. The procurement was open to all potential providers of System Services including non-conventional technologies such as DSUs, distributed generators, storage devices etc. In addition, the TSOs are currently conducting trials to afford technologies which currently have not yet proven their ability to provide specific System Services an opportunity to demonstrate their capabilities. The trials are also assessing how the 3 remaining System Services which have yet to be procured can best be measured, in order to establish reliable performance metrics.

⁴³Further information on the DS3 Programme can be found at www.eirgridgroup.com/how-the-grid-works/ds3-programme/

The CER and the Northern Ireland Utility Regulator are currently investigating optimal competitive procurement options for DS3 System Services, having previously consulted on a combinatorial auction process which was not well received by industry. Tariff based, technical qualification procurement will continue until a competitive procurement process is implemented.

The DS3 programme which includes wider work on grid control centre tools frequency control, voltage control and enhanced forecasting abilities has delivered increases in the ability of the grid system to operate with high levels of renewables. In 2015 the level of permitted non-synchronous generation on an instantaneous basis was set by the TSOs at 50%. Through the delivery of the DS3 programme this has increased significantly, first in 2016 to 55%, and in March 2016 a trial of operation at 60% was deemed successful and the TSO's operational policy has now enabled operation of the grid system with 60% non-synchronous generation.

6.3 Changes to the Market

The Commission for Energy Regulation (CER), as National Regulatory Authority for energy in Ireland, has a specific requirement to consider the effects of its energy regulation on the environment and energy efficiency. The Single Electricity Market (SEM) rules are designed to run the most cost efficient generators to meet electricity demand. Given the operational cost advantage of renewable energy, this increases the overall energy efficiency of generation. These SEM rules also facilitate and encourage the entry of more efficient new generation. SEM rules allow Demand-Side Units (DSUs) to bid into the wholesale market and thus reduce the use of the least efficient generators. As of February 2016, there is 327MW of demand side from ROI registered in the SEM (and 74MW from NI registered).

With ongoing energy market development and EU legislative obligations, work commenced in 2012 on a new market design called the Integrated Single Electricity Market (I-SEM). This work is led by a committee (SEM Committee) comprising the Regulators North and South and independent international energy experts. The project will ensure that the wholesale electricity market makes the best use of all the power on the system by: using interconnectors in the most efficient way; ensuring that market arrangements send out the right signals to investors planning to enter or leave the market; and rewarding the generating plant that best addresses Ireland's electricity system needs. More efficient generators and demand side will benefit from the market changes.

European Electricity Network Codes and Guidelines have been established that require jurisdictional compliance and provide clear guidance regarding the facilitation of demand side response and aggregated distributed generation in energy systems across Europe. The Network Codes /Guidelines on Requirements for Generators, Demand Connection, System Operation, Emergency restoration, CACM, and Electricity Balancing (which was voted in by Member States on 16th March 2017) will be implemented in the coming years by the Irish TSO and DSO, and will be overseen by the CER in its role as the National Regulatory Authority. The CER is already working closely with the TSO and DSO in Ireland to develop the detailed implementation of the requirements of these Network Codes and Guidelines.

The CER, under the auspices of the National Smart Metering Programme (NSMP), will identify the appropriate approach to time of use (TOU) tariffs following consultation with stakeholders, in conjunction with the rollout of smart meters that facilitate half-hourly meter reads, including how such TOU tariffs can facilitate consumer participation in energy efficiency measures.

The SEM Committee has been aware of the benefits that demand response would have for the Single Electricity Market (the 'Market') and has sought to identify barriers to participation in the market by

industrial and commercial customers. Modifications to the rules of the Market have been introduced which address particular barriers to participation. The rule setting forum of the Market, the Trading & Settlement Code Modifications Committee, will consider barriers to DSM identified in current modifications and the implications for demand side participation in relevant future modifications.

Additionally the work underway as detailed in Section 6.2.5 on DS3 System Services is also bringing significant change to the Energy industry and markets in Ireland.

6.4 Energy efficiency in network design and operation

In the 2014 NEEAP Please report on progress achieved in the assessment of the energy efficiency potential of national gas and electricity infrastructure, as well as adopted and planned measures and investments for the introduction of cost effective energy efficiency improvements in network infrastructure and a timetable for their introduction (*EED Article 15(2), Annex XIV Part 2.3.5.*).

In 2017 NEEAP please include information from the assessment of the energy efficiency potential of gas and electricity infrastructure, in particular relating to transmission and distribution, load management and interoperability, and connection to generating installations including access possibilities for micro generators. The NEEAP needs to describe the measures and investments identified to utilise the energy efficiency potentials of gas and electricity infrastructure (*EED Article 15(2), Annex XIV Part 2.3.5.*).

6.4.1 Electricity Infrastructure – (cost effective energy efficiency improvements)

EirGrid's grid development strategy "Your Grid Your Tomorrow" was published in January 2017. It builds upon, and replaces, the original grid development strategy "Grid25". The 2017 strategy is founded on three Strategy Statements:-

- Inclusive consultation with local communities and stakeholders will be central to our approach - acknowledging the sensitivities associated with major transmission infrastructure development.
- We will consider all practical technology options - committed to looking for alternative options that may avoid or reduce the need for new overhead lines.
- We will optimise the existing grid to minimise the need for new infrastructure - avoiding constructing new lines or cables where we can, by increasing the capacity of existing infrastructure and by using new technologies.

The new strategy continues to strike a balance between TECHNICAL - ensuring a safe, secure and reliable grid, COST - ensuring an economical and efficient grid, and ENVIRONMENTAL/COMMUNITY - having due regard for the natural, built and human environment. The Strategy sets out anticipated grid development, including anticipated cost, on a regional basis. The current anticipated cost of the new grid development strategy is approximately €2.6-2.9 bn. This includes the southern part of the North South Interconnector (i.e. that portion in Ireland), which was granted planning permission in December 2016. Table 16 below sets out an overview of the type and km of lines commissioned between 2013 and 2016:

Table 16: Electricity Infrastructure commissioned 2013-2016

Circuit Type / YEAR	2013	2014	2015	2016	Total
110kV New Line (km)	14	68	0	8	90
220kV New Line (km)	0	0	0	0	0
110kV Line Uprate (km)	129	127	79	18	353
220kV Line Uprate (km)	62	33	0	17	112

ESB Networks proactively invests in the distribution system to reduce losses which is the primary method of delivering increased energy efficiency at an infrastructure level. Conversion of the MV network from 10kV to 20kV is the largest contributor to the reduction in network losses. 10kV to 20kV conversion is continuing year on year and still remains a significant contributor to network loss reduction. By 2020 ESB Networks will have converted 50,000km of the distribution overhead network to 20kV.

Network losses reductions are calculated annually and reported to the Regulator.

ESB Networks is also continually developing the operational IT systems that it uses to manage the Distribution System. These are being developed to deliver additional network optimisation capability and deliver more services without additional grid build out.

6.4.2 Gas Networks – energy efficiency

Home energy efficiency is very important in today’s environment and switching to a gas boiler can improve efficiency by at least 10%. Gas emits 22% less CO₂ than oil for the same thermal output. This coupled with improved gas boiler efficiency, results in a reduction of 30% in CO₂ emissions when switching from oil to gas.⁴⁴ Gas Networks Ireland are investing in gas related activities such as Infill (connecting more houses to the gas network), CNG, renewable gas and Gas Corridors (gas network connection to cities and towns) to provide substantial social and economic and better position Ireland to meet its 2020 and 2030 EU climate and energy targets. Increased penetration on the gas network enables more households to switch to lower carbon fuels (from oil to gas) thereby contributing to a reduction in CO₂ emissions. A number of projects (undertaken and planned) by Gas Networks Ireland will further improve energy efficiencies and reduce emissions. These include replacement of Waterbath heaters and boilers with high efficiency boilers and new control technology; a pilot project to install a CHP unit (at a Pressure Reduction Installation) and the feasibility of the installation of CHP will be determined based on the outcome of this pilot.

6.5 Savings arising from all energy supply measures

Please provide for all measures addressing energy efficiency in supply, including those to promote the increased use of efficient cogeneration, a breakdown of savings achieved by measure or by groups of measures up to 2012 and savings expected up to 2020 (EED Article 24(2), Annex XIV Part 2.2.(a)).

⁴⁴ ‘The Future of Oil and Gas in Ireland’, Policy Advisory by the Irish Academy of Engineering, February 2013. Ref: 01/ 02 A/ 02.13.

The energy savings achieved and projected to 2020 from energy supply measures are outlined below in Table 17.

Table 17: Savings from energy supply measures

Supply side efficiency gains	Primary Energy Savings (GWh, PEE)		Final Energy Savings (GWh)	
	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
Transmission and distribution upgrades	279	279	n/a	n/a
Electricity generation efficiency improvements (low)**	3,000	5,000	n/a	n/a
Total	3,279	5,279	n/a	n/a

** Supply-side gains vary significantly in the model depending on the input assumptions around future demand and generation mix. The conservative scenario from the SEAI modelled assessment is presented here.

7. Transport

7.1 Overview of Main policy measures for energy efficiency in transport

Please provide an overview of policy measures aiming to improve energy efficiency in passenger and freight transport, and the promotion of a modal shift to more sustainable modes of transport (*EED Article 24(2), Annex XIV Part 2.2.*).

Recently the European Commission published the 'European Strategy for Low-Emission Mobility' in which one of the main objectives is to increase energy efficiency within the transport sector. The Strategy promotes maximising digital technologies and smart pricing as well as encouraging a shift towards zero emission vehicles and the increased deployment of alternative energy sources for the transport sector. Technological developments are a driving force behind increasing energy efficiencies. It is critical for Ireland, as a technology taker, to be suitably positioned to adapt quickly to the expanding market of energy efficient alternative fuels and technologies.

As such, the Government has implemented, and continues to develop, several policies and procedures to remove barriers to market development and promote the uptake of low emission, energy efficient vehicles and fuels, such as:

- EU regulations for mandatory emission reductions;
- Rebalancing of National Vehicle Registration Tax (VRT) and Motor Tax regimes;
- Introducing the National Policy Framework on Alternative Fuels Infrastructure for Transport;
- Establishing the Low Emission Vehicle (LEV) Taskforce;
- Promoting Eco-Driving techniques;
- Investing in public and sustainable transport and promoting modal shift;
- Improving energy efficiency within the public transport system;
- Developing a National Intelligent Transport Systems (ITS) Strategy;
- Aligning land and transport planning policies.

7.1.1 Role of EU Regulations in Increasing Efficiencies in the Transport Sector:

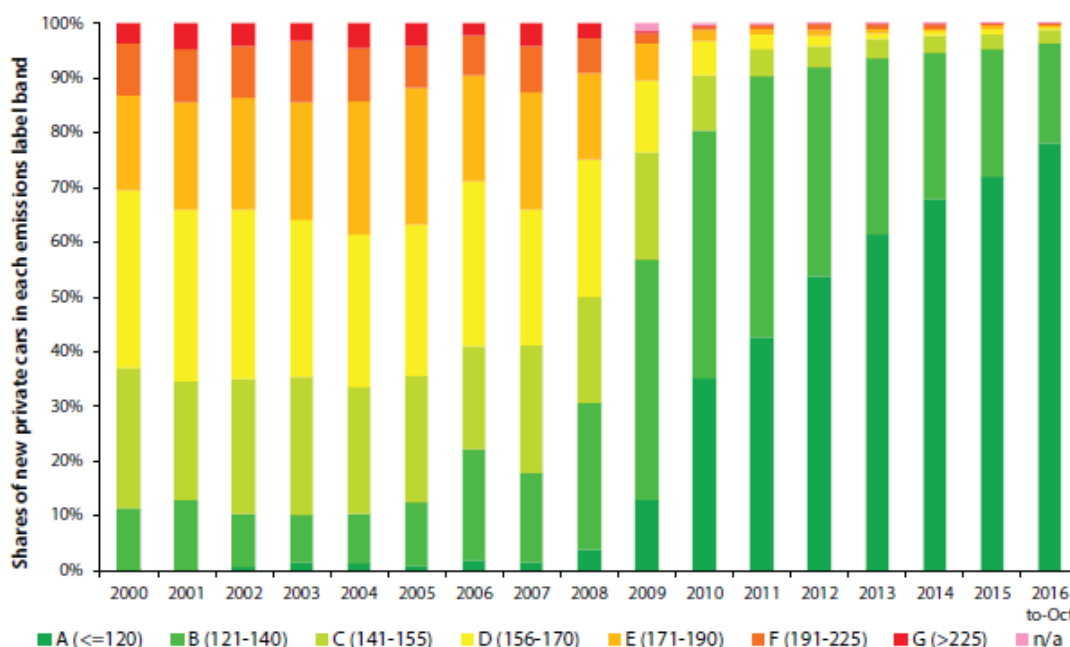
EU Regulation 443/2009, relating to the emission performance standards for new passenger cars, established that by 2015 the average CO₂ emissions for all new passenger cars registered in the EU would be less than 130g CO₂/km. This legislation is the cornerstone of the EU's strategy to improve the fuel economy of cars sold on the European market and has prompted car manufacturers to develop innovative energy efficient technologies. The regulation also states that by 2021 the average fleet emission to be achieved by all new cars should not exceed 95g CO₂/km. The 2015 and 2021 targets represent reductions of 21% and 42% respectively compared with the 2007 new passenger car fleet average of 164g/km. Similar targets have been set for new light commercial vehicle fleets (EU Regulation 510/2011) with a requirement that new vans registered in the EU do not emit more than an average of 175g CO₂/km by 2017 and that by 2021 the average emissions fall to a target of 147g CO₂/km (19% less than the 2012 average). The European Commission is working on post-2021 CO₂ standards for cars and vans and in late 2016 launched a public consultation on potential options. The successful implementation of these regulations has been, and continues to be, fundamental to Ireland's short term decarbonisation strategy, particularly up to 2030. The impact that the passenger car EU regulations has had on Ireland's energy efficiency savings is greater than was previously predicted during NEEAP3. This can be predominately attributed to an increase in the number of new car registrations and the growth of the passenger car fleet.

7.1.2 Rebalancing of National Vehicle Registration Tax (VRT) and Motor Tax regimes:

The VRT and the motor tax system were initially rebalanced in 2008 to support the policy aim of reducing CO₂ emissions, as well as influencing the purchasing decisions of vehicle owners through encouraging the take up of low-emission vehicles and reinforcing the carbon reduction objectives of the above EU Regulations. Vehicles were initially categorised in seven graduating bands, A to G, based on CO₂ emissions levels, with those choosing to purchase lower-emission vehicles paying less in VRT and motor tax. Since January 2013, a revised banding structure was introduced for both motor tax and VRT, splitting the lowest CO₂ Band 'A' (1 - 120g/km) into four new bands and Band 'B' (121 - 140g/km) into two new bands. A zero emissions band for electric vehicles was also introduced for motor tax purposes only.

There has been a marked change in the proportion of new cars purchased within the different emission bands (Figure 6). In 2009, the first full year of the new emissions based system of charging for motor tax, 12% of new vehicles purchased were in the lowest emitting "A" Band, with 45% in the "B" Band. In 2012, for the first time, over half (54%) of all new car purchases were in the lowest emissions "A" Band with 38% of purchases in Band "B". In 2016, 78% of new purchases were in the A Bands and 18% in Bands B. Cars with CO₂ emissions of 140 g/km or higher now comprise just 4% of new car purchases. Rebalancing the motor tax and VRT regimes has ensured that technological improvements are impacting more rapidly on the composition of the national car and van fleet compared to an alternative taxation system based on different criteria such as engine size. The net effect has been to accelerate the reduction of carbon emissions within the national fleet and significant fuel and energy savings over the lifetime of each vehicle. This measure is considered a very effective means of influencing purchasing decisions by motorists in favour of more fuel efficient vehicles. Future band revisions may be needed to account for the improving energy efficiencies and broader environmental impacts associated with new emerging vehicles types.

Figure 5: Shares of new private cars by emissions band 2000-2015 (+2016 to October)



* Source: Based on Vehicle Registration Unit data

7.1.3 Promoting Alternative Fuels and Technologies:

A transition to alternatively fuelled vehicles will be required to effect a substantial reduction in transport emissions and improved energy efficiencies. The European Commission has developed an Alternative Fuels Infrastructure Directive (2014/94/EU) which is expected to reassure car manufacturers and investors of the EU's long term commitment to the adoption of vehicles powered by alternative fuels. Ireland's *National Policy Framework on Alternative Fuels Infrastructure for Transport* is due to be published in May 2017. The framework includes a range of measures aimed at supporting the uptake of low emission vehicles and addresses infrastructure requirements to ensure an appropriate level national recharging network, including electric vehicle (EV) charging points and natural gas refuelling stations.

Incentivising Low Emission Vehicles:

In 2009, EVs were identified as an important element in efforts to achieve both energy efficiency and renewable energy targets as part of the EU Climate Change-Energy Package. Ireland set an initial target of converting 10% of its passenger and light commercial vehicle stock to EVs by 2020 (c. 230,000 vehicles). However, the initial uptake of EVs was lower than anticipated thus the target was revised to 50,000 in the third National Energy Efficiency Action Plan (NEEAP). Despite a range of supports being in place, the uptake remains relatively low. At the end of 2016 there were approximately 2,000 EVs licensed in Ireland. Low uptake can be attributed to a number of barriers, not least, the high cost and limited choice of vehicles on the market as well as low consumer acceptance and awareness. The target for EV uptake was revised to 20,000 electric vehicles by 2020 in the National Policy framework on *Alternative Fuel Infrastructure for Transport*. The energy savings attributed in this document are based on this revised ambition. The actual energy efficiency savings recorded in 2016 for incentivising EV uptake were higher than the expected 2016 savings reported in NEEAP 3 as there are slightly more EVs on the road than were initially projected; however, the expected savings out to 2020 are lower than previously reported in NEEAP 3 due to the downward revised target for EV uptake from 50,000 to 20,000.

Globally, there are strong indications from energy market analysts and car manufacturers that mass market adoption of EVs is likely. Increasing range performances, technology advancements, greater affordability and improved consumer choice will be the greatest levers in triggering large-scale change. The full electrification of the Irish car fleet could be feasible in the medium to long-term. It is anticipated that electrification will not be suitable for the freight sector and a range of alternative fuel types or combinations will more likely be employed including, biogas, biofuels, hydrogen, compressed natural gas (CNG) and liquid natural gas (LNG).

The Electricity Supply Board (ESB) manages a nationwide installation programme of EV charging points. Up until 31 December 2016 1,705 EVs were grant aided. At the end of 2016, approximately 800 public AC charge-points including 79 DC fast chargers had been installed. Most towns with a population of 1,500 or over have at least one charge point in place. Additionally, there were c. 1,700 domestic private charge points installed as part of an incentive scheme to install 2000 free charge points to qualifying EV purchasers.

Since 2011, the SEAI has been providing grants of up to €5,000 to incentivise consumers to purchase a battery electric vehicle (BEV) or a plug-in hybrid electric vehicle (PHEV). Up until 31st December 2016, 1,705 electric vehicles have been grant aided. In addition to the grant scheme, such vehicles qualify for vehicle registration tax (VRT) relief of between €2,500 and €5,000 depending on the type of low emission technology being used. This provides a maximum combined subsidy (grant plus VRT relief) of €10,000 in the case of a BEV and €7,500 for a PHEV. In Budget 2017, it was announced that VRT relief on BEVs will continue until the end of 2021 with relief until the end of 2018 for PHEVs, while the grant scheme will continue throughout 2017. In addition, a tax incentive called Accelerated Capital Allowances for Energy Efficient

Equipment for companies paying corporation tax is in place supporting the purchase of BEVs, PHEVs, hybrid vehicles and the associated charging equipment.

Within the May 2016 *Programme for a Partnership Government* a commitment was made to establish a dedicated **Low Emission Vehicle Taskforce** to consider the range of measures and options available to Government to accelerate the take-up of low carbon technologies, especially EVs. The work of this LEV Taskforce will focus on three broad areas: market growth stimuli and visibility; infrastructure, energy legislation and pricing; and planning, building regulations and public leadership. It is expected that the preliminary recommendations from the Group will be submitted to Government by the end of Q2 2017.

Incentivising Natural Gas and Biogas:

The 2015 Budget indicated that the excise rate for natural gas and biogas as a propellant will be set at the current EU Minimum rate of €2.60 per GJ and this rate will be held for a period of eight years. This measure should incentivise the adoption of natural gas as a transport fuel through providing certainty around the reduced excise and putting CNG in a competitive position in relation to diesel. The uptake of natural gas is seen as potentially providing a pathway for the future use of biogas in the transport sector.

Gas Networks Ireland has received funding from the European Commission, under the Connecting Europe Facility (CEF) Transport Fund, to carry out a study of the impact of installing 14 Compressed Natural Gas (CNG) refuelling stations and a large scale renewable gas injection point on the gas network in Ireland. The project is known as the "Causeway Study" and represents a significant deployment of CNG refuelling infrastructure in Ireland. The provision of a biogas injection facility will enable indigenous renewable gas to become part of Ireland's future transport fuel mix. Construction and deployment of the stations will continue until 2019 and the study will be completed in 2020. As part of the study, Gas Networks Ireland has a Natural Gas Vehicle Fund to support the deployment of dedicated CNG vehicles. The fund, which is worth €700,000, has been set up to fund the difference in cost between a conventional vehicle and a CNG vehicle.

Green Public Transport Fund:

The Department of Transport, Tourism and Sport (DTTAS) has established a Green Public Transport Fund to support the uptake of low carbon, energy efficient technologies within the public transport sector. The fund will support pilot demonstrations of emerging low emission technologies, particularly for buses, and will also support measures to encourage the transition of the national taxi fleet towards alternative technologies.

7.1.4 Eco-driving:

Eco-driving is a term used to describe the energy efficient use of vehicles using driving techniques that can lead to average fuel savings of 5-10%. An educational campaign, aimed primarily at commercial fleets (HGVs and Buses), has potential to significantly impact reduce emissions and fuel efficiency particularly in the freight sector. Consideration is also being given to the development of a grant scheme for HGV/bus operators to train drivers in eco-driving techniques and install in-vehicle technology to assess and improve driver behaviour.

7.1.5 Public and Sustainable Transport Investment:

Public Transport Capital Investment:

Based on the findings in the *Strategic Investment Framework for Land Transport* investment in public transport is prioritised based primarily on the need to maintain and renew strategically important elements of the existing transport system and, thereafter, as a means of addressing congestion and expanding the network. With this in mind, of the €3.6 billion allocation for public transport under the Government's Capital

Plan, €2.6 billion has been prioritised for ‘steady state’ maintenance and asset renewal while €1 billion is to be invested in projects to help address congestion and capacity issues.

In the near future, projects such as the “Luas Cross City” and “10-minute-DART” will help manage some of the increasing demand on the transport network. The Luas Cross City project will provide for an estimated 10 million additional journeys per annum on the Luas network and the capacity of the Luas Green line is also being increased in order to accommodate continued passenger growth. The 10 minute DART service will greatly increase frequency and capacity within the rail network. Works have recently completed on the Phoenix Park Tunnel line which has permitted several new services to operate from Newbridge and Hazelhatch to Grand Canal Dock and also outer commuter services such as Carlow, Portlaoise, Kildare and Athlone to connect to the Dublin City Centre through connections at Newbridge/Hazelhatch. Funding continues to be provided for bus fleet replacement and expansion and the development or upgrading of Quality Bus Corridors (QBCs) in both the Greater Dublin Area (GDA) and in the regional cities (Limerick, Cork, Galway and Waterford).

In the medium term funding is provided for the completion of the City Centre Re-signalling Programme and the construction of a new Central Traffic Control Centre for the commuter and intercity rail network. This funding will not only improve national rail movement but will also enable major transport projects to proceed, including the expansion of the DART line to Balbriggan. The largest single project that will proceed during the lifetime of the Capital Plan will be the New Metro North which will serve the growing population along the Swords/Airport/City Centre corridor. Collectively, these measures will greatly enhance the capacity of the public transport system when completed and will provide viable alternatives to private car use. Since the publication of NEEAP3 in 2014 public transport usage into Dublin City Centre during morning peak travel has increased from 48.4% of modal share to 48.6% in 2016 (based on the Canal Cordon Report, 2016). A mid-term review of the Capital Plan will be carried out in 2017 and the case for increased and accelerated public transport investment will be put forward to address the growing transport needs.

Sustainable Transport Investment and Promoting Modal Shift:

DTTAS is focused on the promotion of sustainable means of transport through the provision of funding for infrastructure, behavioural change programmes and through taxation incentives such as the Cycle to Work Scheme and the Tax saver Scheme. Under the Capital Plan, €100 million has been committed to Smarter Travel Programmes and carbon reduction measures, to improve access to alternatives to the private car through the availability of public transport links and routes that are cycle and walking-friendly. Smarter Travel funding programmes are administered by the Department. In addition, funding is provided to the National Transport Authority (NTA) for the implementation of sustainable transport measures in the GDA, including cycling and walking infrastructure as well as QBCs, safety, integration and traffic management projects throughout the region (the Sustainable Transport Measures Grants Programme). The NTA also manages a similar sustainable transport grants programme in the regional cities of Galway, Limerick, Cork and Waterford (the Regional Cities Programme).

According to the Canal Cordon Report 2016, the number of people using sustainable transport modes into Dublin City Centre has continued to increase. In 2016, sustainable travel accounted for over two thirds of all journeys into Dublin, with 134,559 people using bus, train, Luas, walking or cycling at peak morning times, compared to 132,188 in 2015. The gap between sustainable and non-sustainable modes of transport continues to grow with people entering the city centre by car down from 67,755 in 2015 to 67,442 in 2016. The percentage change in modal shift in Dublin has increased dramatically from 59% of journeys in 2010 being made through sustainable means to 67% in 2016. Cycling has grown in popularity since the publication of NEEAP 3; in 2014, 10,349 trips were recorded during the 2014 Canal Cordon Report compared to 12,089 in

2016. The Public Bikes scheme has been a great success, there are c.65,000 registered users in Dublin with a further 14,500 users in the regional cities. Likewise, the number of people recorded as walking into Dublin City Centre during Canal Cordon survey has also risen significantly from 19,711 in 2014 to 21,473 in 2016. Taking account of the commitment in the Programme for Government that additional funding will be made available for Greenways, DTTAS is currently working on a new Greenways Strategy that will inform future investment decisions. In addition a new national cycling standard 'Cycle Right', developed in 2016 to provide for a consistent approach to cycle training in national schools, is currently being rolled out.

Tax incentives have been successfully employed to promote cycling and increase public transport usage. The Cycle to Work Scheme was established in 2009 to encourage more people to cycle to work, thereby contributing to lowering emissions, reducing congestion and improving health and fitness levels. Under the scheme, employees can save up to 52% of the retail price of bike and equipment and Employer's Pay Related Social Insurance (PRSI) is not payable on the cost of the bicycle and/or safety equipment. The Taxsaver Scheme was introduced in 1999 to incentivise the use of public transport for commuting. Currently, over 3,500 companies are registered with the Scheme saving up to 10.75% in PRSI, while employees can save between 29% - 52% on the regular transport ticket price.

Investment continues into integrated ticketing, journey planners, on-board Wi-Fi and real time passenger information help to make public transport an attractive travel mode. The "Leap card" has been a resounding success since its launch in December 2011. By end-2016 over 9.4 million journeys were taken on average each month using Leap Cards, accounting for approximately half of all passenger journeys. Various enhancements have been added to the Leap Card over time such as multi-operator daily and monthly capping, transfer rebates, integration with the Public Service Card (PSC) and the Public Bike scheme. The two millionth Leap card was sold in November 2016 and the Leap Top-Up App was launched in early 2016 and has already proven to be very popular. The Real Time Passenger Information (RTPI) programme continues to be rolled out with over 700 RTPI signs in operation nationally displaying easy-to-read departure times and passenger information. The National Journey Planner, available online and as an app, provides door-to-door information for all journeys in Ireland including journeys on foot and by all modes of public transport. Usage of the software is growing and during November 2016 alone the system received 3.8 million requests and calculated 1.2 million trips million trips.

7.1.6 Improving Energy Efficiency in the Different Transport Sectors:

Energy Efficiency in Public Transport:

Within public transport a number of energy saving initiatives have been undertaken by service providers/operators through adopting various technological solutions and instigating driver behaviour change programmes. There are several co-benefits of improving energy efficiency including increased fuel economy, lower emissions and enhanced air quality.

Energy Efficiency in the Heavy Rail Network:

Iarnród Éireann (IÉ – Irish Rail) have actively introduced new measures to improve energy efficiency within the rail sector, namely through the reconfiguration of vehicle size to effectively match passenger numbers. This measure has been particularly effective during off-peak times where passenger numbers are a fraction of those travelling during the peak. IÉ have employed Electric Multiple Units (EMU) on DART trains and Diesel Multiple Units (DMU) on Commuter and Intercity trains to match engine capacity to the number of carriages on the train, as opposed to the old configuration, whereby a large locomotive and generator were required for each train regardless of the number of carriages. IÉ advise that reconfiguring train sizes has yielded savings of 35 GWh of diesel (3.5 Million litres of diesel) and 2 GWh of electricity (2 Million units kWh)

within the first year of implementation. IÉ also employ an Eco-Driving System which advises drivers when to “coast” rather than “power” based on known topography, load, and timetabling. IÉ estimate that Eco-Driving can potentially save up to 5% on fuel use. An evaluation of the effectiveness of the system is planned.

A number of additional energy efficiency measures are also being considered by IÉ, including: new DART traction control software which may yield a 5% reduction in traction electricity; reducing generator run times by switching to an automated changeover system which could save c. 3 to 4 GWh per year; retrofitting new traction packages with fuel-efficient engines to locomotives which incorporate Automatic Engine Start Stop (AESS) systems with an expectation of reducing fuel usage by 25%; and IÉ are also in the final stages of testing a diesel additive with potential savings of 5% to 6% in diesel use. In late 2017 IÉ intend to fit a three-car Intercity train with a new gearbox model which promises to realise a 15% fuel saving (based on UK trials). An evaluation of energy efficiency will be carried out over 12 months. As the Intercity fleet consumes 25m litres of diesel per year the potential savings from this measure could be significant.

Energy Efficiency in Bus Éireann:

Diesel use is the primary energy consumption within Bus Éireann (BÉ) accounting for 96.2% (286 GWh) of the company’s energy consumption in 2015. BÉ did not achieve their energy target reduction for 2014 mainly due to growth and expanded services; nevertheless, a reduction of 1.5% has been achieved since 2012. The further expansion of services is expected to increase overall energy usage within BÉ; however, energy usage would be significantly higher without the use of higher capacity vehicles, including longer tri-axle coaches, double deck coaches and double deck buses instead of the traditional single deck two-axle fleet previously used.

BÉ fleet comprises of a mixture of different EURO standard vehicles. In 2016, 24% of the fleet was EURO VI compliant with the remainder adhering to EURO V (13%), EURO IV (43%) or EURO III (20%) standards. In 2017, 98 new vehicles meeting the Euro VI emissions standard will replace older less efficient vehicles, increasing the proportion of EURO VI vehicles to over 38% of the entire fleet. BÉ have noted that typical fuel savings on their Euro VI vehicles tend to be 6-8% when compared to Euro V equivalents. A number of strategies for long term replacement and upgrading of the Bus Éireann school bus fleet of 500 vehicles remains under consideration. A phased transformation to new low emissions, environmentally friendly dedicated school buses has been assessed and could deliver environmental savings of up to €14 million over the 10 year transition period.

Eco-Driving principles continue to be rolled out in the company through driver training and the Driver Certificate of Professional Competence (CPC) standard. To complement the Eco-Driving training, over 280 vehicles have been fitted with a telematics system which can provide the driver with a continuous on-board driving style improvement system. The telematics system also provides valuable information on individual vehicle performance and route fuel consumption rates. Telematics will be a standard feature on all new vehicles and older fleet vehicles will be assessed for retrofitting suitability. Since 2009, all new vehicles have been fitted with an automatic engine idle shutdown to avoid unnecessary fuel use. In 2017, the engine idle shutdown time will be reduced from 7 to 5 minutes for improved energy efficiency. Other longer term initiatives being considered by BÉ include measures for reducing rolling resistance, reducing overall un-laden vehicle weight, regenerative braking and micro-hybrid systems. Developing technologies and alternative fuel sources will also continue to be monitored including hybrid, CNG and full electric bus systems.

Energy Efficiencies in Dublin Bus:

Traffic congestion has increased on many Dublin Bus (DB) routes consequentially reducing average speeds and impacting fuel efficiencies. The company has developed numerous initiatives to respond to these

challenges including traffic light prioritisation measures, junction reviews to reduce bottlenecks, and Eco-Driving. The latter initiative was introduced in 2012 and continues to form part of DBs Driver's Continuous Professional Development Programmes. The Eco-Driving system uses a dedicated vehicle fitted with a number of sensors and cameras to provide real-time information for use in the assessment of driver behaviours. This data is analysed to encourage smooth driving, reduce fuel consumption and decrease vehicle wear and tear. Due to the success of the Eco-driving initiative, a trial of on-board telematics providing real-time information directly to the driver will be piloted on a number of buses in 2017.

Since 2014 the NTA has funded the purchase of 270 new Euro VI buses and it is envisaged that that another 100 new buses will be purchased in 2017. Currently 26% of the DB fleet is compliant with Euro VI emission standards, these new buses are more efficient than the buses they replace. The overall fuel consumption for the fleet has continued to improve with a current average fuel consumption of 48.1 l/100km. This has been coupled with a 5% overall reduction in CO₂ emissions since 2014, despite an increase in both passenger numbers and bus kilometres. Technological advances in the production of newer buses also had the benefit of reduced maintenance requirements and energy resource consumption. New technologies and alternative power sources continue to be monitored by DB, with the aim of transitioning towards low carbon technologies including diesel hybrid and full electric bus systems. A number of energy management projects have also been undertaken to reduce energy consumption at DB depots. Lighting has been upgraded with more efficient LED lights; maintenance equipment has been fitted with automatic shut-off controls; while bus washes have been replaced with more efficient motors and improved control systems. These improvements have collectively yielded reductions in electricity consumption of approximately 20% per depot.

Energy Efficiencies in the Light Rail Network:

Transport Infrastructure Ireland (TII) has conducted a number of programmes to improve energy efficiencies within the light rail (LUAS) system. Energy mapping was undertaken to identify areas that require greatest focus. The mapping identified traction as the largest energy consumer (42%) with heating and ventilation (H&V) accounting for a further 32% of energy consumption. From May 2015 to May 2016 a trial energy saver cubicle was installed on a modified Luas Green Line tram to attempt to recover the braking energy generated by the traction motors. It was concluded that the cubicle could save 4-7% of the total tram energy usage; however the trial also revealed that trams in their current configuration are very energy efficient and so retrofitting energy saver cubicles was not considered a cost effective measure at this time. In 2015, TII investigated reducing energy consumption levels in the H&V modules by recirculated air from the tram for heating instead of the existing system which uses fresh air. The recirculated air was warmer and therefore reduced demand on the heating system. The trial demonstrated potential energy savings of 30%, further trials are required to validate the modifications and to ensure that passenger safety requirements continue to be met.

As part of the Green Line Infrastructure Upgrade Project all LUAS platforms from Harcourt to Stillorgan inclusive are being extended by 10m in length. As part of this project, TII have incorporated the requirement for the majority of the platform lighting to be retrofitted with LEDs as an energy savings measure. TII are also considering the installation of up to 250kW photovoltaic arrays at Red Cow and Sandyford depots and the retrofitting of all remaining Luas platform lighting with LEDs.

Energy Efficiencies in the Public Sector Fleet:

The Public Sector Energy Efficiency Strategy, published in January 2017, highlights the role that the public sector fleet can play in testing new technologies, facilitating and accelerating market uptake of new technologies such as alternative fuels usage and improving the environmental performance and fuel

efficiency of the sector at the same time. Beyond fleet focused measures, there is also scope for the promotion of energy efficient measures through modal shift with a focus on travel choices made by public servants.

Energy Efficiencies within the Aviation Sector:

The Irish and UK National Supervisory Authorities (NSAs) created the UK-Ireland Functional Airspace Block (FAB) in 2008 to help reduce fragmentation of air navigation service provision across Europe and improve efficiencies. It is anticipated that FAB will be a key instrument to achieving significant aviation fuel and energy savings. The air navigation service providers (ANSP's), namely the Irish Aviation Authority (IAA) and National Air Traffic Services (NATS) in Ireland and the UK respectively, are planning to jointly implement a variety of operational measures which will help to deliver flight and energy efficiencies to airline customers. Since 2008, as a result of FAB- related measures, particularly more direct routings, over €70m has been saved through reductions of 232,000 tonnes of CO₂ and 73,000 tonnes of aviation fuel. A key focus of the FAB in the period up to 2020 will be the achievement of additional fuel savings by means of offering airlines more optimum flight paths.

In 2016, the International Civil Aviation Organisation (ICAO) agreed to the implementation of a global market-based scheme for the reduction and offsetting of emissions in aviation. Ireland has declared its intention to take part in the scheme from the outset starting in 2021 and will help develop standards in preparation for the implementation of the Carbon Offsetting and Reduction Schemes for International Aviation (CORSIA). In 2016 Ireland updated its National Action Plan for Aviation Emissions Reduction in line with the ICAO 2013 Resolution on Climate Change. Ireland will continue to monitor its implementation and keep under review with a proposed update of the Action Plan scheduled for completion in 2018.

Energy Efficiencies within the Maritime Sector:

As in Aviation, the Maritime sector is also regulated at an EU and global level. In 2011 the International Maritime Organisation (IMO) adopted mandatory technical and operational energy efficiency measures which are expected to significantly reduce the amount of CO₂ emissions from international shipping. These mandatory measures (EEDI/SEEMP) entered into force on 1 January 2013. The expected growth of world trade represents a challenge to meeting a future target for emissions required to achieve stabilization in global temperatures and so IMO has begun consideration of further technical and operational measures to enhance the energy efficiency of ships. Ireland supports and implements the existing IMO measures and will continue, in co-ordination with our EU colleagues to support the introduction of future IMO measures designed to enhance global maritime energy efficiency. In 2015, the EU enacted Regulation (EU) 2015/757 on the monitoring, reporting and verification of CO₂ emissions from maritime transport. The Regulation sets out a requirement on ship owners and operators for the monitoring, reporting and verification of emissions. While the Regulation does not impose any obligations to reduce emissions or improve energy efficiency at this stage, the European Commission are required to publish annually, information on fuel consumption, CO₂ emissions and technical efficiency of each ship based on information supplied to the central database.

Energy Efficiencies within the Freight Sector:

Moving goods by rail freight produces on average 80% fewer emissions than the transport of the same goods by road. ÍÉ is committed to growing the market share of rail freight, from the current low base of 1% of goods by volume. DTTAS intends to carry out a review of the rail freight market which will identify ways to grow rail freight's market share. The rail freight review is part of a DTTAS review of the freight market across all modes. This review will consider how freight movements can contribute to a reduction in emissions and improve energy efficiencies. A review of the heavy good vehicle (HGV) taxation regime carried out by the

Department of Housing, Planning, Community and Local Government has recommended changes which would incentive newer more energy efficient technologies based on EURO classes.

7.1.7 Land and Transport Planning:

Transport policies aimed at reducing travel demand and travel distances can only be delivered if there are effective spatial policies in place. The location of schools, jobs, shops, local services and other land uses relative to the location of residential developments are critical determinants of the need to travel, the distances to be travelled and the modes of transport chosen. Additionally, the provision of sustainable transport alternatives can only be effective if matched with complementary development patterns which support and facilitate their use. Future investment in new public facilities must take account of the need for access without reliance on the car. Public transport use and modal shift should be encouraged through efficient planning. The implementation of forthcoming National Planning Framework: *Ireland 2040 - Our Plan*, will be central in setting the context for future national planning objectives and will ensure that all future land use and transport planning are fully aligned to successfully influence how people travel. Land use policy is a key determinant in transport investment decisions at both the strategic and local level.

7.1.8 National Intelligence Transport System Strategy:

Investment in intelligent transport systems (ITS) continues to be made through a number of various programmes, including RTI, integrated ticketing, dynamic motorway information signs and traffic flow management programmes. ITS has the ability to maximise efficient use of infrastructural and consumable resources, including fuel, and has the potential to significantly influence travel movement and patterns. DTTAS is currently scoping a comprehensive National Strategy on ITS which will include consultation with all stakeholders regarding the future direction of intelligent transport systems in Ireland. This will ensure that Ireland is positioned to take advantage of the wealth of new technology and ideas coming from this sector.

7.1.9 Carbon Tax [T7](#)

A carbon tax was introduced in Budget 2010, at a level of €15 per tonne of CO₂ emitted. This tax applies to both petrol and diesel. This was equivalent to an increase of €0.042 per litre and €0.049 per litre respectively. Budget 2012 increased this level to €20/tonne of CO₂ emitted resulting in price increase relative to the baseline of €0.014 per litre for petrol and €0.016 per litre of diesel. The impact of this carbon tax in terms of fuel efficiency is difficult to assess, in particular given the complex interaction with vehicle purchasing patterns, other fuel taxation increases, and general economic circumstances impacting on fuel demand. However, research suggests that fuel prices are an important aspect in terms of long term fuel demand and so the contribution of carbon tax to fuel pricing is likely to be a contributing factor to reduced fuel usage.

7.2 Savings arising from transport measures

Please provide a breakdown of savings achieved and savings expected up to 2020 by measure or by groups of measures (EED Article 24(2), Annex XIV Part 2.2 (a) and (b))

The primary and final energy savings from measures targeted at energy use in transport are outlined in the below.

Savings arising from improved fuel economy of the private car fleet (while modelled and presented) have not been included in calculating the total as at the time of writing eligibility to count these savings has not been

confirmed with the Commission and on that basis SEAI modellers have advised they be excluded. Should subsequent clarification determine that it would be appropriate to include some or all of these savings the projection will be updated.

Table 18: Energy savings from Transport measures

Transport Sector	Primary Energy Savings (GWh, PEE)		Final Energy Savings (GWh)	
	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
Electric vehicle deployment	7	63	7	63
Vehicle registration tax (VRT) and annual motor tax (AMT) rebalancing	1,048	1,071	1048	1071
Improved fuel economy of LGVs (EU Regulation)	24	115	24	115
Aviation efficiency	253	253	253	253
Total	1,331	1,501	1331	1501
*Improved fuel economy of private car fleet (EU Regulation)	1,833	3,842		

*These savings were included in the previous NEEAP - excluded here from overall calculations of progress to target (placed 'on hold') pending CION clarification if they can be counted for Art 3.

8. Cross Sectoral (Horizontal) Measures

8.0 Horizontal measures

Please provide information on the overall amount of energy savings that will be required over the obligation period in order to meet the target set in accordance with Article 7(1), and, if applicable, on how the possibilities listed in Article 7(2) and (3) are used (EED Article 7, Annex XIV Part 2.2(a)).

Please provide a description of the national energy efficiency obligations scheme as referred to in Article 7(1) (EED Article 7, Annex XIV Part 2.3.2)

Please provide a description of the alternative policy measures adopted in application of Article 7(9) and Article 20(6) including information on how their equivalence is ensured (EED Article 7, Annex XIV Part 2.3.2)

Please provide information on the methodology used to determine energy savings and their lifetimes of individual actions realised as a result of the energy efficiency obligation schemes or alternative policy measures and national coefficients chosen accordingly (EED Article 7, Annex V; Annex XIV Part 3.2). Furthermore, where applicable, provide information on other methods used to take into account lifetime of energy savings than the one provided in Annex V.2(e) and how it is ensured that it leads to at the least the same total quantity of savings (EED Annex V.2(e)).

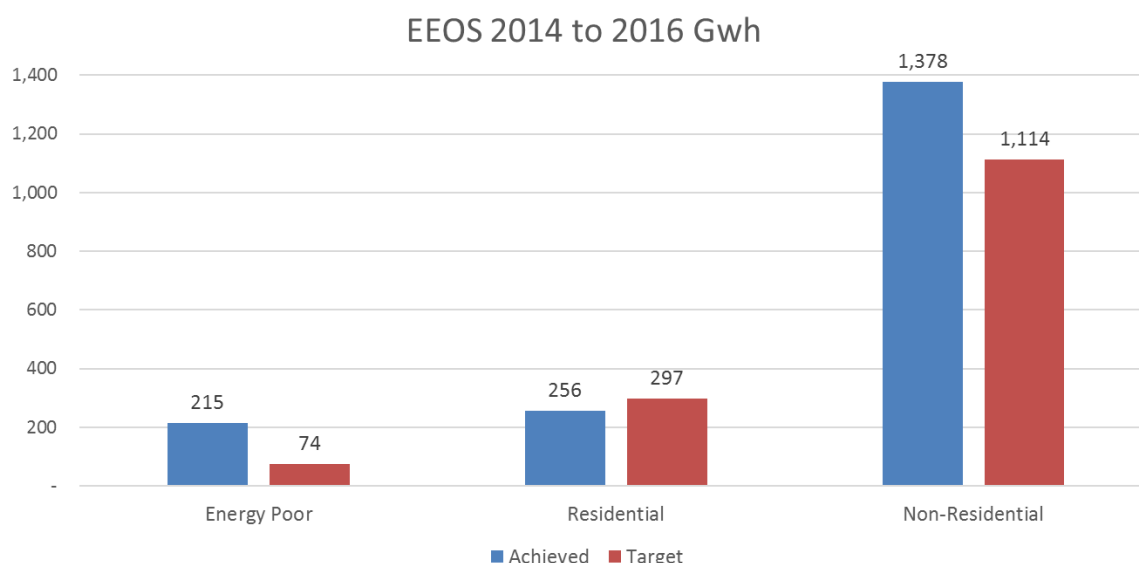
Where applicable, please present published energy savings achieved as a result of the implementation of the energy efficiency obligation scheme and alternative policy measures (EED Article 7(6), (8) and (10), Annex XIV Part 2.2(a))

8.1 Energy Efficiency Obligation Scheme **X1**

As noted, in the 2014 National Energy Efficiency Action Plan, Ireland's national target under Article 7 of the EED equates to 1,102GWh PEE per annum. This national target is being met through a combination of Alternative Measures and an Energy Efficiency Obligation Scheme. The details of this approach were set out in the notification submitted to the Commission in December 2013.

The Energy Efficiency Obligation Scheme was introduced in 2014 and required all energy suppliers with annual sales above 600GWh to achieve collective energy savings of 550GWh per annum. Over the first phase of the obligation scheme (2014-2017) energy suppliers are projected to have delivered energy savings of 1,850GWh.

Figure 6: EEOs 2014 to 2016 GWh



Source - Energy Efficiency Obligation Scheme Annual Report

Following a review and public consultation of the obligation scheme conducted in 2016, the annual target obligated parties are collectively required to deliver has been increased to 625GWh in 2017 and will further increase to 700GWh for 2018, 2019 & 2020. In addition, the threshold for participation in the scheme will be decreased from 600GWh annual final energy sales to 240GWh annual final energy sales. All other terms and conditions for the scheme remain the same. Obligated energy suppliers are required to deliver their energy efficiency savings in the non-residential (75%), residential (20%) and energy poverty (5%) sectors.

It is worth noting that the majority of energy savings achieved in the energy poor and residential sectors have been achieved through obligated party participation in Government-led schemes. In contrast, the vast bulk of energy savings delivered in the commercial sector have been delivered by obligated parties operating their own schemes.

Figure 7: Energy poor credits



Figure 8: Residential credits

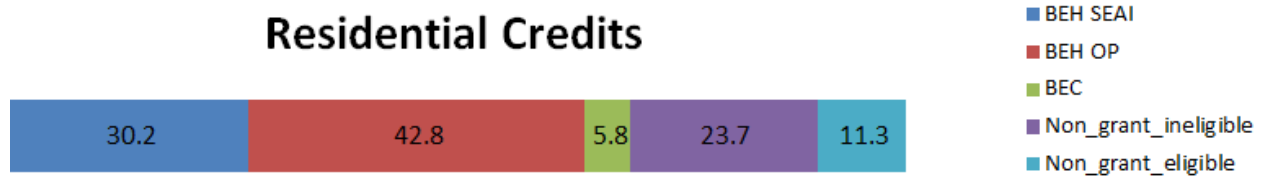
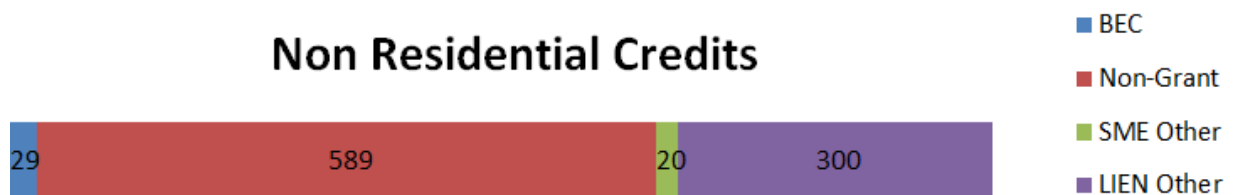


Figure 9: Non-residential credits



Alternative Policy Measures

A brief description of the alternative energy policy measures is set out in the table below. Savings associated with these are shown and accounted for where these measures are covered in more detail under their relevant chapters of this Action Plan

Table 19: Description of Alternative policy measures

Notified Alternative Measure	Brief description
SME Programme	The programme aims to increase energy efficiency in SMEs through providing advice, mentoring and training to participating SMEs
Large Industry Energy Network	The Large Industry Energy Network (LIEN) is a voluntary network, facilitated by SEAI, of companies working to maintain strong energy management and environmental protection practices.
Building Regulations – Dwellings (2008, 2011, 2015) – Buildings other than Dwellings (2014)	The Building Regulations are a series of incrementally improved efficiency standards that are moving towards low to zero carbon housing. The measures impose minimum efficiency standards for new buildings.
Efficient Boiler Replacement	The measure, under the building regulations, sets a minimum seasonal efficiency of 86% efficiency from 2008 and 90% efficiency (gross calorific value) from 2011, for all boilers installed in existing or new dwellings
Smart Meters	The Smart Metering Programme will facilitate improved energy efficiency by empowering consumers with more detailed, accurate and timely information regarding their energy consumption and costs, thus helping consumers reduce any unnecessary energy usage and shift any discretionary usage away from peak consumption times.
Accelerated Capital Allowances	This measure promotes the use of (qualifying) energy efficient products and technologies by providing a tax incentive
VRT / Motor Tax	Vehicles are taxed on the basis of their CO ₂ emission levels since 1 st July 2008.

Source – SEAI - In May 2015 Ireland informed the commission that they were going to exclude savings from the Home Renovation Tax Incentive from the notified measures. They also indicated that, for the time being, they were not going to use savings from the CO₂ tax.

8.2 Existing Training and Certification Schemes

Please provide information on existing or planned certification or accreditation schemes or equivalent qualification schemes (including, if applicable, training programmes) for providers of energy services, energy audits, energy managers and installers of energy-related building elements as defined in Article 2(9) of Directive 2010/31/EU (EED Article 16, Annex XIV Part 2.3.7)

Training programmes covering energy efficiency and installation of energy efficiency products are generally developed and available from the National Further Education and Training Authority “Solas” as well as from various universities and Institutes of Technology. In addition there is a wide range of private sector training providers accredited by a variety of national and international bodies.

Quality and Qualifications Ireland (www.qqi.ie) is an integrated agency (estd. 2012) capturing all HETAC and FETAC levels and is the agency responsible for the National Framework of Qualifications (NFQ). Where there is a legislative requirement (e.g. Building Energy Ratings, BER) there are certification schemes in place. Where there are voluntary standards (e.g. ISO 50001) the Irish National Accreditation Body (INAB) maintains quality. For contractors availing of Grant schemes, certain minimum training requirements are defined by the grant awarding body (SEAI).

For a range of specific areas SEAI determine the qualification criteria to register for the delivery of services. Minimum criteria are set and in the case of the domestic sector, for consumer protection, strong quality assurance and disciplinary procedures are also put in place. Key examples are set out below.

Building Energy Rating - Training

The Building Energy Rating (BER) system in Ireland, for both domestic and non-domestic dwellings is managed by SEAI. A key aspect is to define the qualification criteria of BER Assessors in the market and to ensure, on a continuous basis, that they remain up to date on the requirements of the assessment procedures as they grow and evolve in line with EU Directives and national requirements. BER assessments are completed by [registered BER Assessors](#) who have been trained under the National Framework of Qualifications, have passed the SEAI BER Assessor national exam and have registered with SEAI. The national exam, which is regularly updated, is available in 41 exam centres to facilitate easy access for BER Assessors. Minimum achievement levels are defined and the national exam must be retaken every two years to ensure practicing assessors remain fully up to date. They also sign up to a Code of Practice and there is a Quality Assurance and Disciplinary Procedure in place to address underperformance where it arises.

Better Energy Homes contractors

The [Better Energy Homes](#)⁴⁵ scheme provides grants to homeowners who wish to improve the energy performance of their home by investing in one or more of the following areas: Roof Insulation, Wall Insulation, Installation of a High Efficiency (> 90%) Gas or Oil fired Boiler, Heating Control Upgrades and Solar panels. Contractors delivering services to consumers under this scheme must be registered with SEAI. To register, contractors must demonstrate that they meet minimum competency level for any technology they wish to install and these criteria are in line again with National Qualification Framework. In addition External wall insulation installers must be registered with National Standards Authority of Ireland (NSAI) Agrément ETICS both for the product and confirmation of relevant training. Additional information can be found here [SEAI - I am a Contractor](#)⁴⁶

Registered Energy Auditors

To comply with Article 8 of the Energy Efficiency Directive relating to audits SEAI has established an Energy Audit Scheme. It sets out requirements for Auditors under the scheme. These include that Auditors have an appropriate related technical qualification. Recognising the comprehensive approach which professional bodies apply to their courses, qualifications and/or competence assessment of their members the final criteria for registration is to be listed on register or hold specific additional qualification. Examples include Chartered Energy Manager with Energy Institute, Certified Energy Manager or ESOS (UK Auditing scheme) Lead Assessor. As with all other SEAI registration schemes it is a requirement to sign up to and comply with a Code of Practice. As of March 2017 there were 100 auditors registered under the Energy Audit Scheme. More information available at [SEAI - Energy Auditing Scheme](#)⁴⁷

8.3 Other energy efficiency measures of a horizontal nature

Please indicate which appropriate other energy efficiency measures have been undertaken or are planned to be adopted to implement Article 19. In particular, please provide the list of appropriate measures undertaken to remove regulatory and non-regulatory barriers to energy efficiency (e.g. split incentives in multi-owner properties; and public purchasing and annual budgeting and accounting of public bodies) (EED Annex XIV Part 2.3.9)

⁴⁵ http://www.seai.ie/Grants/Better_energy_homes/

⁴⁶ http://www.seai.ie/Grants/Better_energy_homes/contractor/

⁴⁷ http://www.seai.ie/Your_Business/Energy-Auditing-Scheme/

8.3.1 Split Incentives

SEAI estimate that in order to reach our 2020 EU obligations we need to retrofit 75,000 houses per year until then. As the rental sector counts for almost one third of the 1.7m houses in Ireland, it will need to make a significant contribution to Ireland's 2020 target.

The issue of split incentives in this sector is extremely challenging. Rented properties are typically less energy efficient than owner occupied housing. This situation is likely to continue in the absence of Government intervention. In order to encourage both property owners and tenants to undertake energy efficiency measures we need to highlight the benefits of energy efficiency to them and complement any regulatory measures with support schemes. In May 2014, the Irish Government published its strategy document *Construction 2020 - A Strategy for a Renewed Construction Sector*. Article 7 of this Strategy required DCCAE, DHPCLG and the SEAI to "establish a working group and invite public comment on the feasibility and impact of setting minimum thermal efficiency performance standards in properties offered for rent or lease in the residential and commercial sectors". This working group has now developed an evidence base on the likely positive and negative impacts of such a policy in the rental sector, along with a report on the potential impacts in the social housing sector. DCCAE will carry out a public consultation in Q2 2017 to publish along with this report, which will seek views on the report itself as well as on how we can improve the energy efficiency of properties in the rental sector in a way that is acceptable to both property owners and tenants. DCCAE will continue to monitor best practice in dealing with the issue of split incentives across the EU and worldwide.

8.3.2 Energy-related products

The promotion of energy efficient products covered by the EU Ecodesign and Energy Labelling Directives provides further opportunities to achieve significant energy savings. The Ecodesign Directive sets progressively higher standards resulting in the least energy efficient products being pushed from the market. Energy labelling encourages and facilitates consumers to purchase products with a better energy rating thereby pulling the market towards the development of more energy efficient products. By setting ambitious energy and environmental performance requirements for a range of products the Directive provides new opportunities for European manufacturers. Those who can produce more energy efficient and sustainable products using innovative design processes will have significant competitive advantage.

Energy savings arising from the implementation of all the regulations pertaining to the Ecodesign and Energy Labelling Directives have been estimated to be substantial – in the region of 1890TWh per annum across the EU by 2020⁴⁸. Implementation of the Ecodesign and Energy Labelling Directives is provided for in national legislation (S.I. No's. 366 of 2011 and 454 of 2013 respectively). The Minister for Communications, Climate Action and Environment is designated under national legislation as the Market Surveillance Authority (MSA) for both Directives. He is supported by the SEAI who from 2016 have operational responsibility for market surveillance functions and who it is intended will take over the remaining market surveillance (enforcement) functions during 2017. Enterprise Ireland provides advocacy for Irish business in the development and review of the Ecodesign regulations. It also offers an advisory service to stakeholders in regard to implementation of regulations.

The purpose of market surveillance is to promote compliance with this legislation and to seek to ensure that non-compliant products are removed from or prevented from being placed on the EU market. Market surveillance acts as a deterrent, helping to ensure that compliant economic operators can benefit from a level playing field whilst protecting consumers and the environment.

⁴⁸ Ecodesign Impact Accounting report for the European Commission – VHK 2015

National inspection programmes have been in place since 2012. Since 2016 market surveillance activities have been enhanced to include a focus on stakeholder engagement with a view to harnessing the capacity and interest of stakeholder in the successful implementation of the Regulations. Market research has also been undertaken to establish market operators' awareness and understanding of their obligations, helping to inform the development of compliance promotion and consumer awareness-raising activities. Inspections have also been extended to include online sales of relevant products.

Ireland continues to be an active participant in the EU Administrative Cooperation (ADCO) Groups for ecodesign and energy labelling and SEAI is currently participating in an EU funded multi-state co-operative initiative on tyre labelling known as "MStyr15"⁴⁹. This project involves market surveillance activities targeting a specific product area: passenger car tyres. Tyres are a major product sector on the EU market with annual sales exceeding 250 million, with consequential huge opportunities to reduce energy use and emissions in the transport sector, and with evident road safety benefits too.

8.4 Financing Measures

Please indicate whether the Member State has set up or is planning to set up an Energy Efficiency Fund (EED Article 20)

8.4.1 Energy Efficiency Fund

The Energy Efficiency Fund was established in March 2014, with the objective of providing appropriately priced finance for energy efficiency projects in the public and private sectors. The aim of the Fund is to address one of the predominant barriers to economic activity in the non-domestic sector – the availability of credit that is structured properly and of appropriate term. It was also intended to further develop the market for energy performance contracting and energy service companies. Sustainable Development Capital LLP ("SDCL") was appointed as advisor to the Fund following a competitive tendering process undertaken by the Department of Communications Climate Action and Environment. SDCL is a specialist manager of energy efficiency funds, with funds in Ireland, UK, USA and Singapore, each with Government as a cornerstone investor. Since its establishment in 2014, the Fund has attracted additional funds from private sector institutional investors, which when combined with a Government investment of €35m, brings the total size of the fund to €78.8m in capital which is in excess of the original €70m fund target. To date the Fund has completed two successful investments. While this is behind the level of investment expected at the outset, the fund advisor is confident that there will be a significant level of investment over the next 12 months. Shareholders in the fund voted to extend the investment horizon for another year to allow the projects under development with the fund to reach fruition.

8.4.2 Financing approaches across sectors

The measures detailed elsewhere in this Plan to support energy efficiency objectives through SEAI are funded annually through the vote of DCCAE.

To support the intensification of efforts on Ireland's energy efficiency and climate change objectives the allocation to SEAI for energy efficiency and NEEAP relevant renewables measures and programmes (capital

⁴⁹ Further information on this project can be accessed at <http://www.mstyr15.eu/index.php/en/>

and current) has been increased from €72.7 million in 2016 to €100.2 million for 2017⁵⁰. This 27.5 million (37.8%) year on year increase in resourcing enables significant enhancement of the range of supports available for energy efficiency and climate action objectives through SEAI both in terms of improved human resource support capacity within the Authority and increased spend on programmes. It will facilitate the expansion of existing initiatives and supports as well as the introduction and piloting of new initiatives described elsewhere in this Action Plan.

Besides the specific measure supports through SEAI costs of energy efficiency measures are generally borne by the general operating and capital costs of the various bodies tasked with carrying out such measures. Details of other direct and other financing provisions are provided below where direct costs are identifiable.

EPBD

The Building Energy Rating (BER) Scheme is administered by the Sustainable Energy Authority of Ireland (SEAI), who has responsibility for the registration of BER Assessors, logging of BER assessments and ongoing management and development of the scheme, including the collection of registration and assessment fees from BER assessors. A list of fees and levies currently being charged can be found on the SEAI's website⁵¹.

The scheme operates on a cost-neutral basis⁵² and the EPBD Regulations allow SEAI to use BER revenue to offset costs incurred in connection with carrying out its functions under the EPBD Regulations. Expenditure under the scheme to date is shown in the table below which also provides an estimation of funding required for the period 2014 – 2016.

Table 20: BER expenditure and estimation of funding for 2014-2016

2007 – 2011 €m	2012 €m	2013 €m	2014 €m	2015 €m	2016 €m
12.051	2.245	4.740	1.767	2.409	3.798

Source:- SEAI

⁵⁰ The Capital allocation has been increased from €65,337,000 in 2016 to €90,790,000 in 2017. Most of this allocation – all apart from two Renewables measures - €7m for the RHI Scheme and €5.15m for electric vehicles – relates to energy efficiency measures.

⁵¹ http://www.seai.ie/Your_Building/BER/BER_Assessors/BER_Assessor_Registration/Schedule_of_Fees/

⁵² Initial seed capital of €3.2 m provided by the Exchequer is being periodically repaid as surplus funds become available.

Buildings

Better Energy - The National Upgrade Programme (BE) was launched in May 2011 to support the energy efficiency upgrade of one million homes, businesses and public buildings. The BE Programme as outlined in Section 3.1 offers financial assistance for energy efficiency upgrade works. Since 2011 the scheme has provided €203m in grant assistance. Details of funding provided to date and estimated levels of funding for future years are shown in the table below.

Table 21: Better energy funding

2011 €m	2012 €m	2013 €m	2014 €m	2015 €m	2016 €m	2017 €m	Total €m
97	71	35	54	46	54	65	422

Under the Housing Investment Programme, Local Authorities are provided with capital funding to undertake a suite of measures, including energy retrofitting, to improve the standard and quality of LA-owned housing stock. It is expected that funding will continue to 2020. The funding provision for this Programme in 2017 is €22 million. Based on a no-policy change scenario it is expected that an annual funding provision of similar order will be made available over the period in question.

Housing Aid for Older People

The Department of Housing, Planning, Community and Local Government administers the Housing Aid for Older People scheme which provides grants of up to €8,000 to assist older people living in poor housing conditions to have necessary repairs or improvements carried out. Grant eligible works include structural repairs or improvements, re-wiring, repairs to or replacement of windows and doors, provision of water supply and sanitary facilities, provision of heating, cleaning and painting.

Table 22: Housing Aid for older people, 2010-2016

Year	Number of homes that received a grant	Total Investment €m
2010	7,205	30.774
2011	6,511	27.102
2012	4,848	19.910
2013	2,815	11.247
2014	3,634	13.498
2015	3,127	11.267
2016	3,425	12.647
Total	31,565	126.445

It is anticipated that a further 4,000 homes will be improved in 2017 for older people.

Equipment

As described under Section 5.1.5 the Accelerated Capital Allowances (ACA) for Energy Efficient Equipment scheme offers a tax incentive for companies who invest in highly efficient equipment to avail of tax breaks by allowing such businesses deduct the full cost of the eligible equipment from taxable profits in the year of purchase rather than over the usual eight year period. The tax savings are complimented by a reduction in energy costs and carbon emissions. Data received from the Revenue Commissioners on ACA tax claims submitted are shown in the table below. Further information on Costs of Tax Expenditures (Credits, Allowances and Reliefs can be found at [Office of the Revenue Commissioners](http://www.revenue.ie/en/about/statistics/costs-expenditures.html)⁵³ website.

Table 23: ACA Scheme Investment

Year	No. Claims Submitted	Investment in ACA equipment	Tax Rebate Claimed
		€m	€m
2009	93	13.4	1.6
2010	68	5.0	0.6
2011	76	11.3	1.3
2012	77	8.0	1.0
2013	65	5.6	0.7
2014	57	7.2	0.9

Public Sector

In February 2014, €9m in Government funding was allocated to expand the *Optimising Power @ Work* energy efficiency campaign into the wider public sector. Although the programme is tailored for each specific type of facility, the 3 core principles of technology (installing energy metering), specialist resources (providing energy specialists) and staff engagement (working closely with the staff in the facility) remain the same. The programme is now successfully underway in Large Acute Care Hospitals (16), Universities (2), Institutes of Technology (5), Local Authorities (10), Prisons (9) & Specialist Facilities (5). Initial indications are that savings will be in line with those achieved in the central government buildings.

As referred to under Section 2.2 (Additional energy efficiency targets), the public sector has been charged with taking an exemplar role on energy efficiency with a more challenging 33% energy efficiency target. The first [Public Sector Energy Efficiency Action Plan](#) will support the achievement of this goal. It sets out existing energy efficiency measures and supports available and introduced new structures, measures and supports. One such new financial support is the provision by Department of Communications, Climate Action & Environment (DCCA) of €3m funding in 2017 for a pilot programme to enable the Office of Public Works (OPW) in partnership with the Sustainable Energy Authority of Ireland (SEAI), to carry out an initial tranche of

⁵³ <http://www.revenue.ie/en/about/statistics/costs-expenditures.html>

medium to deep energy renovation upgrade projects in selected central government buildings. This initiative aims to:-

- build on progress achieved through the “[Optimising Power at Work](#)” initiative
- test and develop renovation approaches that can be replicated more widely in the public sector
- learn from approaches to carrying out these renovations, and
- demonstrate what can be delivered and achieved from such efficiency upgrades.

Electric Vehicles

An electric vehicle grant scheme was introduced in 2011 providing grant supports of up to €5,000 for the purchase of new Electric Vehicles (EVs). These grants are in addition to the Vehicle Registration Tax (VRT) reliefs of up to €5,000 that also apply to EVs. Budget 2017 extended VRT reliefs on Battery Electric Vehicles to 2021 and on Plugin Hybrid Electric Vehicles to the end of 2018. Since the introduction of the EV Grant Scheme in 2011 to the end of 2016, the purchase of 1,725 new electric vehicles has been supported. Of these, 1193 were grant aided between 2015 and 2016. To end 2016, €8.2m in grant funding has been provided. Funding of €5m has been allocated for this scheme in 2017.

In 2016 the Department of Communications, Climate Action and Environment and the Department of Transport, Tourism and Sport established a Low Emissions Vehicles (LEV) Task Force involving relevant Government Departments and agencies. The work of the task force has been divided into two phases with the first phase focusing solely on EVs. The Task Force is expected to report on an interim basis to Government on the first phase by June 2017, with recommendations for facilitating greater uptake of EVs in the coming years. The efficiency projections arising from Electric Vehicles are shown under Chapter 7.

8.5 Promotion of efficient heating and cooling

8.5.1 Comprehensive assessment

In the 2014 NEEAP please include information about the process, participants and the methodology used for preparing the comprehensive assessment, including a short description of how the country-level cost-benefit analysis is carried out in accordance with Part 1 of Annex IX (*EED Article 14(1) and (3), Annex IX.1, Annex XIV Part 2.3.4*).

In the second and subsequent NEEAPs, please provide an assessment of the progress achieved in implementing the comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling referred to in Article 14(1) and the role of heat market developments in this progress (*EED Article 14(2) (EED Article 14(1), Annex XIV Part 2.3.4)*).

In the 2014 NEEAP, please provide the identified economic potential for:

- i. High-efficiency cogeneration (*EED Article 14(1), Article 14(3)*);
- ii. The efficient district heating and cooling (*EED Article 14(1), Article 14(3)*);
- iii. Other efficient heating and cooling systems (optional, *EED Article 14(2), Article 14(3)*).

In the 2014 NEEAP and other future NEEAPs please provide a description of measures, strategies and policies, including programmes and plans, at national, regional and local levels to develop the economic potential of high-efficiency cogeneration and efficient district heating and cooling and other efficient heating and cooling systems as well as the use of heating and cooling from waste heat and renewable energy sources, including measures to develop the heat markets (*EED Article 14(2), Article 14(4), Annex VIII 1(g)*).

District heating has had very limited levels of development in Ireland for a range of reasons including our population dispersal patterns, the nature of our housing stock, the temperate climate and, compared to other countries where biomass district heating has developed, Ireland has relatively low levels of forestry.

The report "[Cost Benefit Analysis of the potential for High-Efficiency Cogeneration and Efficient District Heating & Cooling in Ireland](#)" was produced at end 2015 and subsequently submitted to the CION in fulfilment of the requirements of Article 14 of the Directive (2012/27/EU).

The report concluded that heat demand in Ireland is generally low density in nature with heat mapping and analysis demonstrating that around 90% of the heat demand is at densities too low to make DH a viable proposition. If the heat density was lowered, the technical potential may increase, but the proportion which is uneconomic is likely to increase.

Subsequent analysis using the gas and water networks as a proxy for network length, as opposed to road lengths used in the 2015 report submitted to the CION in fulfilment of the requirements of Article 14 of the Directive (2012/27/EU) showed a higher heat density. In addition, work funded by SEAI under its research programme and carried out by Codema⁵⁴ and IrBEA⁵⁵ shows that the district heating opportunity may be significant, particularly for fourth generation heat networks. The 2015 Report also did not consider the wider energy system impacts of large scale district heating networks. In the context of the Energy White Paper ambition and the ambition to reduce GHG emissions by 80%, these wider considerations must be further evaluated and considered before determining the district heating opportunity in Ireland.

While the cost effectiveness of retrofitting District Heating is a challenge with the current building stock and in relation to capital costs and logistics, district heating provides a good fit for a fourth generation district heating network. This becomes evident as the building stock is upgraded and it moves to a near-zero energy buildings (NZEBs). For example, NZEBs can be heated from low temperature heating sources which mean that the temperature of a DH network can be much lower. This allows more waste heat to be accessed and means that the DH pipes can be smaller. Also, heat losses in the network will be vastly reduced. In short, NZEBs are an appropriate fit with district heating networks.

8.5.2 Application of Planning and Building Regulations to high efficiency co-generation, district heating and cooling.

Part L of the Building Regulations Conservation of fuel and energy in Dwellings requires the mandatory use of Renewable Energy Sources - a minimum of 10 kilowatt hours per square metre per annum. This requirement promotes the use of district heating fuelled by renewables and cogeneration schemes in new housing developments.

DEPC&LG Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas encourage Combined Heat and Power schemes, particularly in higher density developments and where biomass (e.g. wood pellets) provides the energy source; and district heating, particularly if waste heat from nearby industries can be utilised.

⁵⁴Codema is Dublin's Energy Agency and was set up as a not-for-profit limited company by [Dublin City Council](#) in 1997 under the SAVE II Programme of the European Union. Access to the Codema Fingal Spatial Energy Demand Analysis can be found at http://www.seai.ie/Renewables/Energy_Research_Portal/National-Energy-Research/RD-D-Projects/2016-RDD-82-Spatial_Energy_Demand_Analysis_Fingal-CODEMA.pdf

⁵⁵Irish Bioenergy Association's (IrBEA) role is to promote the bioenergy industry and to develop this important sector on the island of Ireland. Access to A Guide to District Heating in Ireland can be found at http://www.seai.ie/Renewables/Energy_Research_Portal/National-Energy-Research/RD-D-Projects/2016-RDD-79-Guide_District-Heating_Irl-CODEMA.pdf

8.5.3 REFIT 3 X2

The EU Renewable Energy Directive 2009/28/EC set Ireland a legally binding target of meeting 16% of our energy demand from renewable energy sources by 2020. Ireland is committed to achieving this target through meeting 40% of electricity demand, 12% of heat and 10% of transport from renewable sources of energy.

Following State Aid approval, supports in the form of feed in tariffs for electricity produced from biomass CHP plants were introduced in 2012 to incentivise the use of high efficiency cogeneration from renewables. The scheme called REFIT 3 (Renewable Energy Feed in Tariff)⁵⁶ was designed to incentivize the addition of 310MW of renewable electricity capacity to the Irish grid and to support up to 185 MWe of cogeneration from anaerobic digestion and solid biomass. The tariffs for cogeneration technologies range from €126 per MWh to €157 depending on the size of the plant and the technology used. REFIT 3 is the first REFIT scheme to offer support for cogeneration.

Renewable Electricity Support Scheme (RESS) *(The legal basis for this scheme is Art 3 of Directive 2009/28/EU - the Renewables Directive).*

The Government has a range of policy measures and schemes to incentivise the use of renewable energy. The existing Renewable Electricity Feed-in Tariff (REFIT) schemes are the principal means of supporting renewable electricity generators for energy exported to the grid. A new Renewable Electricity Support Scheme (RESS) to provide support for renewable electricity is under development in the Department of Communications, Climate Action and Environment. An initial public consultation was launched in 2015. A further consultation is due to take place in the first half of 2017, with the broad details of the scheme being published later in the year. Finalisation of the scheme is subject to Government approval and State aid clearance from the European Commission.

Renewable Heat Incentive (RHI) *(The legal basis for this scheme is Art 3 of Directive 2009/28/EU - the Renewables Directive).*

A new Renewable Heat Incentive (RHI) scheme aimed at the large industrial and commercial users in the non-Emissions Trading Scheme (ETS) sector is under development. The aim of the RHI is to build on the progress already made in the renewable heating sector and to help reach Ireland's 12% renewable energy target by 2020. Before any new scheme is introduced, the overall costs and technologies to be supported will be subject to Government approval and State aid clearance from the European Commission.

8.5.4 Cogeneration

In 2015, the operational installed electrical capacity for cogeneration was 312.5 MW(e) and the amount of electricity exported to the grid was 1,417Wh. The operational installed capacity for heat was 515.7 MW(t). The total heat produced was 3,595 GWh of which 3,523 GWh was deemed useful heat. Primary Energy Savings of 2,015 GWh (or 23%) were saved and 382 kilotonnes of CO₂ were avoided. Natural Gas fuelled 287.7 MWe of the operational capacity in 2015. Oil products fuelled 7.9 MWe, biogas 6.3 MWe, biomass 5.4 MWe and solid fuel was used by the remaining 5.2 MWe. See the SEAI full report on CHP in Ireland⁵⁷.

⁵⁶ <http://www.dcae.gov.ie/energy/en-ie/Renewable-Energy/Pages/Refit-3-landing-page.aspx>

⁵⁷ http://www.seai.ie/Publications/Statistics_Publications/EPSSU_Publications/CHP_in_Ireland_2013_Report.pdf

8.5.5 Individual installations: cost-benefit analysis, results and exemptions

In the 2014 NEEAP please identify the responsible competent authorities and actors, and explain the process and methodology of the installation level cost-benefit analysis, including district-heating companies and other stakeholders involved (*EED Annex IX Part 1*). In 2017 NEEAP please provide inform shortly about their outcome with some further details (e.g. the number of CBA prepared).

The process and methodology of the Cost Benefit Analysis (CBA) was designed by SEAI. S.I. 426(10), that transposed the directive into Irish Law, stated: The SEAI shall prepare guiding principles for the preparation of installation level cost-benefit analysis in accordance with Annex IX and shall make this information publically available on its website. The SEAI have carried out the preparation of these guidelines. The requirement for an individual assessment is triggered by part (11) of S.I.426 as part of a sites application to the Environmental Protection Agency under the Act of 1992. The SEAI have not received any notifications from EPA in relation to individual site cost-benefit analysis hence no reports are currently hosted on the SEAI website.

Please provide details of the exemptions from the CBA allowed on the basis of Article 14(6) and the ad-hoc exemptions based on Article 14(8), (*EED Article 14(6) and (8)*).

Pursuant to Article 14(6) Ireland notified the Commission in December 2013 of exemptions to the requirement for a cost benefit analysis for installations.

The following installation was notified on the basis that it had run for fewer than 1,500 hours in each of the last five tariff years:

- Rhode Peaking 2 Generator Unit

Nine further installations were notified as having run for fewer than 1,500 hours in some of the preceding five tariff years:

- **Rhode Peaking 1 Generator Unit**
- **Tawnaghmore Peaking 1 Generator Unit**
- **Tawnaghmore Peaking 3 Generator Unit**
- **North Wall Generator Unit**
- **Tarbert 2 Generator Unit**
- **Tarbert 1 Generator Unit**
- **Cushaling Power PPMG2**
- **Cushaling Power PPMG1**

Ireland does not have any nuclear power installations and currently has no installations that are required to be located close to a geological storage site approved under Directive 2009/31/EC and therefore no exemptions are currently required for these categories. This is a situation that is unlikely to change in the short term, although Ireland considers that geological structures close to the current Kinsale natural gas field would be the most likely site in Ireland to be developed as a carbon capture and storage facility that would qualify under Directive 2009/31/EC. Ireland will notify the Commission in the event that such installations envisaged by Article 14(6)(c) are planned, in order to avail of the Directive's exemptions from the requirement for such installations to conduct a cost benefit analysis per 14(5).

Ireland has not, to date, exempted any installations under Article 14(8).

The Table below provides a summary of savings arising and projected under cross sectoral measures not enumerated in other chapters.

Table 24: Savings projected from Cross Sectoral measures

Cross sectoral				
	Primary Energy Savings (GWh, PEE)		Final Energy Savings (GWh,)	
	2016 (achieved)	2020 (anticipated)	2016 (achieved)	2020 (anticipated)
Carbon tax	1,300	1,300	1300	1300
Supplier obligation non-grant (residential)	333	905	325	885
Supplier obligation non grant (non-residential)	894	2,229	727	1837
Behavioural Economics Unit (SEAI)	0	28	0	24
Total	2,527	4,462	2351	4046

9. New, Innovative & Potential Measures

This Chapter focuses on new initiatives that have been introduced since the Third NEEAP (2014) and provides a brief overview of some expansions and enhancements to previous measures. The energy efficiency contribution of these measures is reflected in preceding chapters unless otherwise stated.

9.1 Expansions and enhancements to previous measures

9.1.1 Improvements to the BEP.

To overcome the issue of split incentives in the rental sector, the DCCAE is examining offering the Warmer Homes Schemes to landlords who make their homes available to the Housing Assistance Payment scheme for a period of at least 3 years. This is a pilot initiative (B11) that will be trialled in a limited area to determine its effectiveness before a wider rollout is considered.

9.1.2 BER Certs

Building Energy (BER) Certificates are being enhanced from 2017. Following feedback and stakeholder engagement the BER Certificates and reports will be enhanced with more customer focused information. This is aimed at helping the property owners and other stakeholders better understanding the results of the assessment and in guiding them on how they could make improvements by including suggestions on specific relevant enhancements they could consider as well as indicative costs.

9.1.3 EEOS Expansion

The **Energy Efficiency Obligation Scheme is being expanded**. The targets for obligated parties have been increased for the period 2017-20 and the threshold for obligation will be lowered – further information is provided in Chapter 8.

9.1.4 Better Supports to Public Sector

The existing **supports for public sector bodies** to help them achieve their 33% energy efficiency targets are being enhanced in support of the new Public Sector Energy Efficiency Strategy (see Chapter 4). These include more assistance in establishing a pipeline of larger scale projects and a new pilot fund from 2017 with €3m for upgrades in OPW centrally managed buildings.

9.1.5 Better Energy Communities Programme B3

The Better Energy Communities Scheme was introduced in 2012 as a pilot scheme to support sustainable energy upgrades to clusters of buildings, services, facilities and processes in a local community and to support an area-based approach to tackling energy poverty. The scheme encourages community based partnerships to improve the energy efficiency of homes, community facilities and local businesses. In addition, it seeks to encourage the implementation of deeper and more technically and economically challenging measures than is possible under other grant schemes. Partnerships in the scheme can be between the public and private sectors, domestic and non-domestic sectors, commercial and not-for-profit organisations and energy suppliers. The inclusion of local authorities, community groups and businesses within the scheme leverages considerable additional private investment.

In 2016, over €16 million in grant funding provided for energy efficiency upgrades to more than 2,000 homes and almost 300 community and commercial facilities. The total leveraged investment in energy efficiency was approximately €55 million, supporting more than 700 direct and indirect jobs right across the country. In

total, more than 15,000 homes and hundreds of community, private and public buildings have received energy efficiency upgrades, supporting several hundred jobs each year.

Better Energy Communities 2017 was officially launched on 6th December 2016 and will offer up to €30 million in grant supports for community energy projects in 2017. This represents a 50% increase in funding from the 2016 grant levels. In addition, the scheme provides bonus grant funding for householders who engage in a combined fabric upgrade that involves a significant energy efficiency upgrade to their home, with additional funding available for householders who want to switch to a renewable heating system.

9.1.6 Awareness, Education & Promotion

The “[One Good Idea](#)⁵⁸” initiative for schools run by the SEAI taps into the creativity, imagination and energy of students. The competition reaches about 50,000 students a year on the topics of energy efficiency and climate change. The students develop energy awareness campaigns demonstrating the role we all have to play. Since it began in 2007 over 5,000 students have been directly involved in running campaigns. Through this competition students not only learn a huge amount and spread energy awareness, they become actively engaged in the topic of sustainable energy and motivate others to get involved.

9.1.7 Cost Effective Energy Efficiency improvements in Electricity Infrastructure

EirGrid's grid development strategy "Your Grid Your Tomorrow" was published in January 2017. It builds upon, and replaces, the original grid development strategy "Grid25". Further information is provided in Chapter 6.

9.2 New and Innovative Initiatives

9.2.1 Warmth and Wellbeing Pilot Scheme [B4](#)

The Warmth and Wellbeing scheme is a pilot initiative being delivered under the Government’s Strategy to Combat Energy Poverty and the Healthy Ireland Framework. The objective of the pilot is to validate, in an Irish context, the international evidence that suggests making homes warmer and more energy efficient can have a positive effect on the health and wellbeing of people in energy poverty who are also living with a chronic respiratory condition such as COPD & Asthma.

The scheme was launched in 2016 and the operational area for the scheme was selected as Community Healthcare Organisation (CHO) 7, following consultation with the Department of Health and the Health Service Executive (HSE). This CHO encompasses Kildare/West Wicklow, Dublin West, Dublin South City and Dublin South West. Within CHO 7 the need to build capacity in the local public health and SEAI teams, and establish communications with the local community, meant that a further localisation was necessary and Dublin 12 and 24 were selected as the initial operational areas.

€20m has been earmarked for the scheme in the period 2016 to 2018. Its objective is to better understand the impact on health and wellbeing caused by making homes warmer and more energy efficient. In late 2016, the scheme was expanded to cover Dublin 8, 10 & 22 and eligibility was expanded to cover families with young children as it is hoped that the scheme can also show a positive impact on school attendance and social inclusion. In parallel with the rollout of the scheme a research and evaluation project will be run which will gather the evidence necessary to inform decisions on a future national roll-out. The energy

⁵⁸ <http://www.seai.ie/Schools/One-Good-Idea/>

efficiency contribution of these measures, where relevant, are reflected as part of the Buildings/Residential and Commercial chapters.

9.2.2 Deep Retrofit Pilot **B5**

This will operate from 2017 to establish how best to support deeper levels of renovation in the residential sector. While it will in itself deliver energy efficiency gains its main purpose will be to gain practical experience and insights on how best to encourage and support deeper residential energy efficiency offerings post 2020.

9.2.3 Energy Audits for Large Energy Users

Introduced in Ireland in 2015 in support of the objectives of Article 8 of the Directive. This is covered in more detail in Chapter 5.

9.2.4 Behavioural Economics Unit **X3**

This dedicated new unit will be established in SEAI in 2017. Its objective is to better understand the behaviors and motivations of key decision makers when deciding on choices with energy efficiency potential and how those decisions might be more effectively influenced in favour of more energy efficiency outcomes.

9.2.5 Technical Bureau **P1**

A new unit is being established in SEAI to complement the range of programmes currently delivered by the organisation. This unit will have a particular focus on technical barriers, supports and solutions. The objective is so to catalyse greater and accelerated energy efficiency activity across targeted sectors. Two key pilots are being undertaken in 2017: Schools Sector and Central Government Buildings.

Schools: SEAI and Department of Education and Skills are collaborating on a pilot programme in ten schools, delivering both advice and capital retrofits to a range of schools and where participants are representative of the different building archetypes currently in the sector and fully engaged in wider participation in energy management, integration of energy efficiency into the curriculum etc. .

Central Government Buildings: SEAI and Office of Public Works (OPW) are collaborating on a similar pilot carrying out certain energy upgrades in central government buildings owned and leased by OPW. Similar to the schools pilot selected buildings are representative of the wider building stock and interventions will include testing of some innovative approaches.

Both pilots have the objective of trialling, where appropriate, efficient and effective methods of project delivery, to create a delivery model that is scalable to enable and support these sectors in the achievement of their 2020 targets.

9.2.6 Energy Standards and Design (EXEED)

The EXEED Certified Program was launched by SEAI during 2016. This provides a project-based standard for Energy Efficient Design Management in design of new investments. The objective is to minimise lifecycle energy consumption where energy performance is locked-in during this design timeframe. It can be applied to any new greenfield or brownfield design, major renovation or major energy upgrade projects. It caters for the appropriate design decisions relating to energy service requirements, energy demand and energy sources, including renewable energy supply alternatives. The standard creates the project setting required in projects' organisation structure and processes, and addresses the most resilient barriers and obstacles to

achieving optimum performance in traditional project approaches. When established, EXEED will drive new activity and new behaviour within the complete delivery value-chain of new investments.

Assets are independently certified as 'EXEED Certified' when demonstrating the process-led standard for determination and implementation of optimum energy performance opportunity and lifecycle energy management capability. This Program will seek to apply strategic value for key stakeholders including asset owners (life cycle operating costs), engineering services industry (business development) and financiers (project outcome assurance). Early demonstration projects have achieved typical savings of 20/30% and up to 50% of baseline design. More information is available at [SEAI - EXEED Certified Program](#)⁵⁹

9.2.7 DS3 System Services

The “Delivering a Secure Sustainable Electricity System (DS3)” programme aims to meet the challenge of operating the power system with up to 75% of instantaneous demand being met from windfarms by 2020. A key element of the programme, DS3 System Services, went live in 2016. Further information is provided in Chapter 6.

9.3 Potential Measures

“Potential measures” describes initiatives that are under consideration. At the time of writing (April 2017) these measures have not been approved or funded – some may proceed, if and when approval is obtained and funding is put in place. The energy efficiency gains associated with these measures have NOT yet been factored into national projections. In the event that some of these or other measures are approved revised projections can be made.

Potential measures under consideration include the Smart Meter programme described in Chapter 6, a Renewable Heat Incentive scheme (mentioned in Chapter 8), and regulation of minimal thermal standards in Rental properties.

⁵⁹ http://www.seai.ie/Your_Business/EXEED-Certified-Program/

Glossary of Terms

Term	Description
ACA	Accelerated Capital Allowances
ADCO	EU Administrative Cooperation
AESS	Automatic Engine Strat Stop
ANSP's	The Air Navigation Service Providers
BE	Better Energy - The National Upgrade Programme
BÉ	Bus Éireann
BEP	Better Energy Programme
BER	Building Energy Rating
BEV	Battery Electric Vehicle
CACM	Capacity Allocation and Congestion Management
CBA	Cost Benefit Analysis
CBO	Community Based Organisation
CEF	Connecting Europe Facility
CER	Commission for Energy Regulation
CHO	Community Health Organisation
CHP	Combined Heat & Power
CION	European Commission
CNG	Compressed Natural Gas
CORSIA	Carbon Offsetting and Reduction Schemes for International Aviation
CPC	Certificate of Professional Competence
DB	Dublin Bus
DCCAE	Department of Communications, Climate Action and Environment
DCRP	Distribution Code Review Panel
DH	District Heating
DHPCLG	Department of Housing, Planning, Community and Local Government
DMU	Diesel Multiple Units
DS3	Delivering a Secure Sustainable Electricity System
DSM	Demand Side Management
DSO	Distribution System Operator
DSUs	Demand-Side units
DTTAS	Department of Transport, Tourism and Sport
DUoS	Distribution Use of System
EAS	Energy Audit Scheme
EED	Energy Efficiency Directive
EEDI	Energy Efficiency Design Index
EEOS	Energy Efficiency Obligation Scheme
EMS	Energy Monitoring System
EMU	Electric Multiple Units
EPA	Environmental Protection Agency
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Contracting
EPRP	Energy Performance Related Payments
ESB	Electricity Supply Board

Term	Description
ESBN	ESB Networks
ESCO	Energy Service Company
ESD	Energy Service Directive
ESOS	UK Auditing Scheme
ETB	Education and Training Board
ETS	Emissions Trading Scheme
EV	Electric Vehicle
EXEED	Excellence in Energy Efficient Design
FAB	Functional Airspace Block
FETAC	The Further Education and Training Awards Council
GDA	Greater Dublin Area
GDP	Gross Domestic Product
GGs	General Government Sector
GHS	Greener Homes Scheme
GJ	Gigajoule
GNDI	Gross National Disposable Income
GNP	Gross National Product
GPRN	Gas Point Registration Number
GWh	Gigawatt hours
H&V	Heating and Ventilation
HAP	Housing Assistance Package
HES	Home Energy Saving Scheme
HETAC	The Higher Education and Training Awards Council
HGVs	Heavy Goods Vehicle
HSE	health Service Executive
IAA	Irish Aviation Authority
ICAO	International Civil Aviation Organisation
IÉ	Iarnród Éireann - Irish Rail
IMO	International Maritime organisation
INAB	Irish National Accreditation Body
IrBEA	Irish Bioenergy Association
I-SEM	Integrated Single Electricity Market
ITS	Intelligent Transport System
IVADN	Integrated Vision for an Advanced Distribution Network
Kt	Kilo Tonne
kWh	Kilo Watt hour
LA	Local Authority
LEDs	Light emitting diode
LEV	Low Emission Vehicle
LIEN	Large Industry Energy Network
LNG	Liquid Natural Gas
MPRN	Meter Point Registration Number
MPS	Managed print services
M&R	Monitoring & Reporting
MSA	Market Surveillance Authority
MWe	Megawatts Electrical
MWh	Megawatt hour

Term	Description
NATS	National Air Traffic Services
NDM	Non-Daily Metered
NEEAP	National Energy Efficiency Action Plan
NESF	The National Energy Services Framework
NFQ	National Framework of Qualifications
NMP	National Mitigation Plan
NREAP	National Renewable Energy Action Plan
NSAI	National Standards Authority of Ireland
NSAs	National Supervisory Authorities
NSMP	National Smart Metering Programme
NTA	National Transport Authority
NZEB	Nearly Zero Energy Buildings
OGP	The Office of Government Procurement
OJEU	Official Journal of the European Union
OPW	The Office of Public Works
PECF	Electricity primary energy conversion factor
PEE	Primary energy equivalent
PHEV	Plug-in hybrid electric vehicle
PRSI	Pay Related Social Insurance
PSC	Public Service Card
QBCs	Quality Bus Corridors
RAs	Regulatory Authorities
REC	Reference Energy Consumption
REFIT	Renewable Energy Feed in Tariff
RESS	Renewable Electricity Support Scheme
RHI	Renewable Heat Incentive
RTPI	Real Time Passenger Information
SDCL	Sustainable Development Capital LLP
SEAI	Sustainable energy Authority of Ireland
SEEMP	Ship Energy Efficiency Management Plan
SEM	The Single Electricity Market
SEMC	The Single Electricity Market Committee
SLA	Service Level Agreement
SME	Small and medium enterprises
STAR	Short Term Active Response
TAO	Transmission Asset Owner
TFC	Total Final Consumption
TII	Transport Infrastructure Ireland
TOU	Time of Usage
TPER	Total primary energy requirement
TSO	Transmission System Operator
TUFA	Total Useful Floor Area
TUoS	Transmission Use of System
VRT	Vehicle Registration Tax
WHS	Warmer Homes Scheme

Appendix

Individual Measure Tables

The tables below provide further information on most of the main currently active NEEAP measures. Historical measures that have previously made a contribution to NEEAP targets but are not currently active are not featured – details for those measures can be found in the Appendices to [NEEAP 3](#).

B1		Better Energy Homes (BEH) Scheme
	Relevant EED Article(s)	Not specific to any one EED Article but contributes to achievement of overall target – Article 3.
Description	Category	Buildings - residential
	Timeframe	Ongoing
	Aim/brief description	Stimulate energy-efficiency actions to reduce energy usage by homeowners and the general public.
	Target end use	Residential Sector
	Target group	All homeowners
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	The Sustainable Energy Authority of Ireland (SEAI) grant aids householders who want to make their homes more energy-efficient by providing incentives towards the implementation of energy efficiency measures which include attic insulation, wall insulation, heating systems upgrades, solar thermal panels and accompanying Building Energy Rating.
	Budget and financial resource	Budget allocation changes from year to year
	Implementing body	SEAI
	Monitoring authority	SEAI/DCCAE
Energy savings	Method for monitoring/measuring the resulting savings	An official Building Energy Rating (BER) is completed on each home which receives an energy upgrade under BEH detailing all energy efficiency measures carried out on the house.
	Savings achieved in 2016	1018 GWh PEE 994 GWh Final Energy Savings
	Expected energy savings in 2020	1354 GWh PEE 1324 GWh Final Energy Savings
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		Existing

B2		Better Energy Warmer Homes Scheme (BEWH)
Description	Relevant EED Article(s)	Not specific to any one EED Article but contributes to achievement of overall target – Article 3
	Category	Buildings - Residential
	Timeframe	2000 to date. The Warmer Homes Scheme was incorporated in to the residential retrofit scheme, launched as 'Better Energy' in 2011 and the scheme has been developed and enhanced since.
	Aim / brief description	The measures targets vulnerable and fuel poor homes and provides funding for the installation of domestic energy efficiency upgrades via regional not-for-profit organisations and private contractors
	Target end use	Energy use for domestic heating and hot water
	Target group	Domestic buildings
	Reg. applic.	N/A
Information on Implementation	List & description of energy saving actions	Energy efficiency improvement measures include attic insulation, draught proofing, lagging jackets, energy efficient LED lightbulbs, cavity wall insulation and energy advice.
	Budget & fin. resource	The measures are funded by SEAI via regional not for profit organisations and private contractors.
	Implementing body	Sustainable Energy Authority of Ireland via Regional not for profit organisations.
	Mon. auth.	Sustainable Energy Authority of Ireland (SEAI)
Energy savings	Method for monitoring / measuring the resulting savings	As the scheme is administered by SEAI, statistics on the measures implemented and number of homes covered are collected and analysed. The savings are calculated as the aggregate Unitary Final Energy Saving per household.
	Savings achieved in 2016	275 GWh PEE 269 GWh Final Energy Savings
	Expected energy savings in 2020	355 GWh PEE 347 GWh Final Energy Savings
	Assumptions	Unitary final energy savings per dwelling based on estimated demand reduction from a typical measure package (from list of measures above) installed in a representative low income household. High level of comfort uptake/rebound effect associated with low income households (estimated at 70%).
	Overlaps, multiplication effect, synergy	The WHS is limited to low income households and there is no potential overlap with measures to promote efficiency in new buildings.
Status	Existing	

B3		Better Energy Communities (BEC) Scheme
	Relevant EED Article(s)	Not specific to any one EED Article but contributes to achievement of overall target – Article 3.
Description	Category	Buildings Residential (mostly)
	Timeframe	Ongoing
	Aim/brief description	The Better Energy Communities Programme which was introduced in 2012 as a pilot scheme has replaced the Better Energy Areas and Community Based Scheme. BEC supports sustainable energy upgrades to existing buildings, services, facilities, and processes in the Community sector.
	Target end use	All end users
	Target group	All end users of energy
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Key measures supported include: Building fabric upgrades, technology and system upgrades, integration of control systems, integration of renewable energy sources and domestic combined fabric upgrades.
	Budget and financial resource	Budget Allocation changes from year to year
	Implementing body	SEAI
	Monitoring authority	SEAI/DCCAE
Energy savings	Method for monitoring/measuring the resulting savings	As the Programme is administered by SEAI, statistics on the measures implemented and number of homes/buildings which receive funding are collected and analysed.
	Savings achieved in 2016	245 GWh PEE 228 GWh Final Energy Savings
	Expected energy savings in 2020	581 GWh PEE 543 GWh Final Energy Savings
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		Existing

B4		Warmth and Wellbeing Pilot Scheme
Description	Relevant EED Article(s) (s)	Articles 3, 4
	Category	Buildings – Residential
	Timeframe	2016-2018
	Aim / brief description	To validate, in an Irish context, the international evidence that suggests making homes warmer and more energy efficient can have a positive effect on the health and wellbeing of people in energy poverty
	Target end use	Residential sector
	Target group	Domestic Buildings
	Regional application	Within Community Healthcare Organisation 7
Information on Implementation	List and description of energy saving actions substantiating the measure	Energy efficiency improvement measures include: <ul style="list-style-type: none"> • attic insulation, • external, internal, or cavity wall insulation, • boiler replacement, • replacement of windows and doors where necessary
	Budget and financial resource	€20million over 3 year pilot
	Implementing body	SEAI oversees consultants and contractor companies in the market delivering the energy efficiency savings.
	Monitoring authority	DCCA/E/Department of Health/SEAI/Health Service Executive
Energy savings	Method for monitoring / measuring the resulting savings	An official Building Energy Rating (BER) is completed on each home which receives and energy upgrade under BEH detailing all energy efficiency measures carried out on the house.
	Savings achieved in 2016	0
	Expected energy savings in 2020	23 GWh PEE 22 GWh Final Energy Savings
	Assumptions	High level of comfort uptake/rebound effect associated with low income households (estimated at 70%).
	Overlaps, multiplication effect, synergy	The W&W scheme is limited to low income households and there is no potential overlap with measures to promote efficiency in new buildings
Status	New - Approved	

B5		Deep Retrofit Pilot Scheme
Description	Relevant EED Article(s)	Article 4
	Category	Buildings – Residential
	Timeframe	From 2017
	Aim / brief description	To encourage deeper retrofit of buildings
	Target end use	Residential
	Target group	All homeowners
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Energy efficiency improvement measures which brings the home to a high Building Energy Rating.
	Budget and financial resource	€5m in 2017
	Implementing body	DCCAE
	Monitoring authority	SEAI
Energy savings	Method for monitoring / measuring the resulting savings	An official Building Energy Rating (BER) is completed on each home which receives and energy upgrade under BEH detailing all energy efficiency measures carried out on the house.
	Savings achieved in 2016	0
	Expected energy savings in 2020	18 GWh PEE 18 GWh Final Energy Savings
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		New - Approved

B6		2011 Part L Conservation of Fuel and Energy in Dwellings
Description	Relevant EED Article	Not specific to the EED, however this measure is specific to the Energy Performance in Buildings Directive - Art 9
	Category	Buildings – Residential
	Timeframe	2011 - ongoing
	Aim / brief description	The measure imposes minimum efficiency standards for new dwellings
	Target end use	Domestic energy use
	Target group	General population
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	<p>The 2011 Part L Building Regulations improve minimum standards set in previous regulations:</p> <ul style="list-style-type: none"> • Insulation levels in building fabric • Ventilation and air infiltration • Thermal bridging reduction • Heating and hot water systems controls <p>In addition, a minimum overall performance is set on the Specific Energy Consumption, defined in the regulations as the Energy Performance Co-efficient (EPC) and Carbon Performance Coefficient (CPC). The maximum EPC is set as a 60% improvement on equivalent dwelling built to 2002 Regulations.</p>
	Budget and financial resource	The measure is a regulated minimum standard and has no direct budgetary or financial resource requirement.
	Implementing body	Department of Housing, Planning, Community and Local Government
	Monitoring authority	Department of Housing, Planning, Community and Local Government
Energy savings	Method for monitoring / measuring the resulting savings	Implementation of measures will be enforced through Building Control Regulations. Energy savings and carbon dioxide emissions reductions will be measured through the Energy Performance of Buildings Directive, Annex I Energy Performance Certificate Calculation Methodology.
	Savings achieved in 2016	157 GWh PEE 157 GWh Final Energy Savings
	Expected energy savings in 2020	214 GWh PEE 214 GWh Final Energy Savings
	Assumptions	60% improvement over 2005
	Overlaps, multiplication effect, synergy	None
Status -		Existing

B7		Nearly Zero Energy Buildings (NZEB) Building Regulations Part L 2017 – Buildings Other Than Dwellings
Description	Relevant EPBD Article(s)	Art 9
	Category	Buildings – Residential
	Timeframe	At Public Consultation - to complete in Oct 2017
	Aim / brief description	To introduce new Building Regulations for Buildings and other Dwellings to achieve a reduction in energy and carbon dioxide emissions in the order of 70%.
	Target end use	Buildings and other dwellings
	Target group	Buildings and other dwellings
	Regional application	
Information on Implementation	List and description of energy saving actions substantiating the measure	<p>This measure will provide a reduction in the order of 70% in Carbon emissions from dwellings completed after the 31st Dec 2020 this equates to 91.35 ktCO₂e.</p> <p>This measure will provide a reduction in the order of 50% to 60% in Carbon emissions from all new buildings other than dwellings completed after the 31st December 2020.</p> <p>This measure is being implemented in accordance with the EPB Directive requirement for Nearly Zero Energy Buildings by 31st Dec 2020.</p>
	Budget and financial resource	A cost study published with the Regulatory Impact Assessment shows an uplift in cost for non-residential buildings in the order of 2% to 8%.
	Implementing body	DHPCLG
	Monitoring Athy.	DHPCLG
Energy savings	Method for monitoring / measuring the resulting savings	Implementation of measures will be enforced through Building Control Regulations. Energy savings and carbon dioxide emissions reductions will be measured through the Energy Performance of Buildings Directive, Annex I Energy Performance Certificate Calculation Methodology.
	Savings achieved in 2016	Measure will be implemented from to Jan 2019.
	Expected energy savings in 2020	This measure will provide a reduction in the order of 50% to 60% in Carbon emissions from all new buildings other than dwellings completed after the 31st Dec 2020. Cumulative savings are to be determined.
	Assumptions	50% to 60% improvement in performance.
	Overlaps, multiplication effect, synergy	Major renovations for existing buildings to be also introduced with this regulation.
Status		Currently at public consultation to be signed into law Oct 2017.

B8		2018 Part L Conservation of Fuel and Energy in Dwellings.
Description	Relevant EPBD Article	Article 9
	Category	Buildings – Residential
	Timeframe	2017 - ongoing
	Aim / brief description	The measure imposes minimum efficiency standards for new dwellings
	Target end use	Domestic energy use
	Target group	General population
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	This measure will provide a reduction in the order of 70% in Carbon emissions from dwellings completed after the 31st Dec 2020 this equates to 91.35 ktCO ₂ e.
	Budget and financial resource	The measure is a regulated minimum standard and has no direct budgetary or financial resource requirement.
	Implementing body	Department of Housing, Planning, Community and Local Government
	Monitoring authority	Department of Housing, Planning, Community and Local Government
Energy savings	Method for monitoring / measuring the resulting savings	Implementation of measures will be enforced through Building Control Regulations. Energy savings and carbon dioxide emissions reductions will be measured through the Energy Performance of Buildings Directive, Annex I Energy Performance Certificate Calculation Methodology.
	Savings achieved in 2016	N/A
	Expected energy savings in 2020	8
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		New - approved

B9		Social Housing Upgrades (DHPCLG)
Description	Relevant EED Article(s)	Not specific to any one EED Article but contributes to achievement of overall target – Article 3.
	Category	Buildings - Residential
	Timeframe	Fabric upgrade measures are now on-going. Other measures including heating supply efficiency upgrades and inclusion of renewable energy sources is expected to be advanced in 2018/19.
	Aim / brief description	Energy efficiency upgrades to social housing stock undertaken by local authorities
	Target end use	Social Housing
	Target group	Social Housing residents
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Energy efficiency upgrades to social housing stock. Phase 1 & 2 consist of external fabric upgrade to those social housing units which are below acceptable standards. Work includes attic insulation, draught proofing, and wall insulation as internal, integral to cavity or external.
	Budget and financial resource	To date the following has been spent on this programme from 2013 to 2016 incl. For the years 2013, 2014, 2015 & 2016 the amounts are €26,951,705; €30,723,749; €26,903,781; & €22,532,834 respectively.
	Implementing body	DHPCLG
	Monitoring authority	DHPCLG
Energy savings	Method for monitoring / measuring the resulting savings	All work is monitored by the DHPCLG and the respective local authority on an individual house basis. It is also audited by the Nominated Energy Provider in conjunction with eh SEAI and NSAI. All BER certificate data is filed and recorded with the SEAI.
	Savings achieved in 2016	The Energy savings and Carbon savings achieved in 2016 are 27 GWh (Giga Watt Hours) and 5.4 kt/CO2 (Kilo-Tonnes of Carbon Dioxide)
	Expected energy savings in 2020	
	Expected impact on energy savings in 2020	It is expected that a reduction in the order of 20-30% in Carbon emissions will be achieved in the existing housing stock being upgraded.
	Assumptions	That the overall improvement in performance of 30% will be achieved
	Overlaps, multiplication effect, synergy	It is anticipated that the ideal retrofitting of existing buildings will aim to replicate the performance achievements of dwellings being constructed as new in compliance with the Building Regulations in as much as is practical.
Status	Existing	

B10		Energy Efficiency Boiler Regulation
Description	Relevant EED Article(s)	Implemented through Building Regulations
	Category	Buildings – Residential
	Timeframe	2008 - date
	Aim / brief description	The measure set a minimum seasonal efficiency of 86% for boilers installed in existing or new dwellings from 2008 and 90% from 2011.
	Target end use	Energy use in the domestic sector
	Target group	Domestic buildings
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	The 2008 Part L Building Regulations imposed a minimum boiler efficiency of 86% for all boilers installed in new or existing buildings. This was further improved to a minimum boiler efficiency of 90% in 2011 Building Regulations
	Budget and financial resource	The measure is a regulated minimum standard and has no direct budgetary or financial resource requirement.
	Implementing body	Department of Housing, Planning, Community and Local Government
	Monitoring authority	Department of Housing, Planning, Community and Local Government
Energy savings	Method for monitoring / measuring the resulting savings	Implementation of measures will be enforced through Building Control Regulations. Energy savings and carbon dioxide emissions reductions will be measured through the Energy Performance of Buildings Directive , Annex I Energy Performance Certificate Calculation Methodology.
	Savings achieved in 2016	320 GWh PEE 320 GWh Final Energy Savings
	Expected energy savings in 2020	480 GWh PEE 480 GWh Final Energy Savings
	Assumptions	70% improvement over 2005 requirements.
	Overlaps, multiplication effect, synergy	Major renovations for existing dwellings to be also introduced with this regulation.
Status	Existing	

B11		Warmer Homes Expansion – Pilot for tenants in receipt of HAP
Description	Relevant EED Article(s)	Not particular to any one EED Article but contributes to achievement of overall target – Article 3.
	Category	Buildings – Residential
	Timeframe	From 2017
	Aim / brief description	The expansion of the Warmer Homes scheme to homes of private tenants who are in receipt of the Housing Assistance Payment. This should increase the energy efficiency of buildings in the private rented sector and demonstrate the value of energy efficiency to private landlords. It should also encourage landlords to rent their properties to beneficiaries of the HAP, and increase the availability of housing to people on lower incomes.
	Target end use	Energy use in residential sector
	Target group	Landlords who are renting to tenants in receipt of the housing assistance payment.
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Energy efficiency improvement measures include: <ul style="list-style-type: none"> · attic insulation, · cavity wall insulation, · lagging jacket, · energy efficient LED lightbulbs, · energy advice.
	Budget and financial resource	The measures are funded by SEAI
	Implementing body	SEAI
	Monitoring authority	Sustainable Energy Authority of Ireland (SEAI)
Energy savings	Method for monitoring / measuring the resulting savings	The scheme is administered by SEAI, statistics on the measures implemented and number of homes covered are collected and analysed. The savings are calculated as the aggregate Unitary Final Energy Saving per household.
	Savings achieved in 2016	n/a
	Expected energy savings in 2020	Savings arising from this measure will accrue as a subset of the savings allocated to the BEWH Scheme (B 2).
	Assumptions	Unitary final energy savings per dwelling based on estimated demand reduction from a typical measure package (from list of measures above) installed in a representative low income household. High level of comfort uptake/rebound effect associated with low income households (estimated at 70%).
	Overlaps, multiplication effect, synergy	The WHS is limited to low income households and there is no potential overlap with measures to promote efficiency in new buildings.
Status		New - Approved

B12		Domestic Lighting
Description	Relevant EED Article(s)	Not particular to any one EED Article but contributes to achievement of overall target – Article 3. This measure is specific to the Ecodesign Directive 2009/125/EC
	Category	Buildings & Residential
	Timeframe	1st July 2008 to date. Major changes foreseen, improvements: N/A
	Aim / brief description	The measure is a phasing out of incandescent lights through the Energy related Products Directive (2009/125/EC) and Commission Regulation (EC) No 244/2009.
	Target end use	Energy use in domestic lighting
	Target group	Domestic buildings
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Commission Regulation (EC) No 244/2009 of 18 March 2009 implements Directive 2005/32/EC (superseded by Directive 2009/125/EC) with regard to eco-design requirements for non-directional household lamps. The regulation provides for the phased introduction of minimum efficiency standards for lamps and effectively phases out incandescent lamps.
	Budget and financial resource	The measure is a regulated minimum standard and has no direct budgetary or financial resource requirement.
	Implementing body	Department of Enterprise Trade and Innovation
	Monitoring authority	SEAI
Energy savings	Method for monitoring / measuring the resulting savings	A bottom up model of the housing stock, lighting requirements by room and by lamp rating was developed. The aggregate savings are 45 kWh/yr per lamp replaced based on aggregate savings of 55W and 830 operating hours per annum.
	Savings achieved in 2016	320 GWh PEE 170 GWh Final Energy Savings
	Expected energy savings in 2020	480 GWh PEE 269 GWh Final Energy Savings
	Assumptions	Key assumptions/statistics informing the monitored and projected savings are: <ul style="list-style-type: none"> Existing deployment rate of energy efficient lighting (CFLs) in dwellings Number of fixtures per (average) dwelling Run-time per fitting
	Overlaps, multiplication effect, synergy	Lighting affects the specific energy consumption (Energy Performance Coefficient) calculated for new dwellings under the 2008 and subsequent building regulations. The impact of the improved efficiency of lighting in existing (pre 2008) housing stock is evaluated separately.
Status	Existing	

P1		Technical Bureau
Description	Relevant EED Article(s)	Not particular to any one EED Article but contributes to achievement of overall target – Article 3.
	Category	Public Sector
	Timeframe	From 2017
	Aim / brief description	Provision of tailored advice and support to enable schools and the Department of Education and Science to identify and take advantage of opportunities to reduce energy use and improve energy performance in school building fabric.
	Target end use	Schools - Department of Education and Skills
	Target group	Schools – Public Sector
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Provision of tailored advice and support to enable schools and the Department of Education and Skills to identify and take advantage of opportunities to reduce energy use and improve energy performance when making facilities upgrades to schools including through maintenance, summer works and capital programmes.
	Budget and financial resource	
	Implementing body	SEAI
	Monitoring authority	SEAI/DCCA
Energy savings	Method for monitoring / measuring the resulting savings	
	Savings achieved in 2016	
	Expected energy savings in 2020	Savings arising from this measure will be measured as part of the Public Sector Energy Efficiency Strategy.
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		New - approved

C1		Green Procurement & ACA (“Triple E” List)
Description	Relevant EED Article	Article 6
	Category	Commercial Sector
	Timeframe	From 2008
	Aim / brief description	The measure promotes the use of (qualifying) energy efficient products and technologies by providing a tax incentive for private companies paying corporation tax. This register of products now covering 52 technologies and nearly 17,000 products is mandatory for public bodies so underpins Article 6
	Target end use	Selected energy end uses in industry and SMEs Public bodies for green procurement
	Target group	Industry, SMEs, and public sector
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	The ACA, introduced by the Government in the Finance Act 2008, offers a tax incentive for companies to purchase highly energy efficient equipment. The ACA allows purchasers of eligible energy efficient equipment to write off the full cost of their purchase against their profit for that year instead of having to write it off as normal over a period of eight years. The register established to support this scheme is now mandatory for purchasing by public bodies as mechanism of ensuring the purchase of energy efficient technologies
	Budget and financial resource	The ACA currently covers 10 different equipment categories and 52 associated technologies, and only energy efficient equipment that meets the relevant eligibility criteria is listed on the ACA Specified List (‘Triple E Products Register’).
	Implementing body	SEAI
	Monitoring authority	The ACA scheme results in reduced tax revenues in the year of purchase but is revenue neutral, on a non-discounted basis, over eight years.
Energy savings	Method for monitoring / measuring the resulting savings	Sustainable Energy Authority of Ireland (SEAI) is the body responsible for creating and maintaining the ACA specified list of eligible products for which the incentive can be claimed.
	Savings achieved in 2016	368
	Expected energy savings in 2020	688
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status	Existing	

C 2		Large Industry Energy Network
Description	Relevant EED Article	Article 8 /Article 16
	Category	Commercial Sector
	Timeframe	2000 - Ongoing
	Aim / brief description	The Large Industry Energy Network (LIEN) is a voluntary network, facilitated by SEAI, of companies working to maintain strong energy management and environmental protection practices.
	Target end use	The Energy Agreements Programme is a subset of these companies implementing structured energy management.
	Target group	Large Energy Users in industry and business
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	SEAI actively work with the top 200 energy using companies in the country in a range of networking activities including sharing of best practice, training, Special Working Groups where companies innovate with solutions working on shared challenges in the energy space developing new methodologies (example being Energy Efficient Design Methodology – now and Irish standard IS399 Activities reported annually SEAI - LIEN Annual Reports)
	Budget and financial resource	Supports provided through SEAI
	Implementing body	SEAI
	Monitoring authority	SEAI
Energy savings	Method for monitoring / measuring the resulting savings	Companies report energy use annually through questionnaire and on basis of Energy Performance Index tracking overall performance. Annual Report for Network produced annually –link above
	Savings achieved in 2016	2,074
	Expected energy savings in 2020	2,300
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		Existing

C 3		SME Support
Description	Relevant EED Article	Article 8/ Article 12
	Category	Commercial Sector
	Timeframe	2008 - Ongoing
	Aim / brief description	The programme aims to increase energy efficiency in SMEs through providing advice, mentoring and training to participating SMEs. In addition pilot schemes are developed with a view to stimulating implementation of energy efficiency measures
	Target end use	Energy end use in SMEs
	Target group	SMEs
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	<ul style="list-style-type: none"> • Training is provided for SME's participating in the programme on a grouped basis. • Mentoring is provided to support the training between sessions • There are a range of on line training tools available to SMEs • Other tools to support adoption of energy efficiency are available to all SME's e.g. Energy Awareness toolboxes • Pilot capital supports under development in 2017 to stimulate uptake of targeted energy efficient measures including energy efficiency lights and variable speed drives
	Budget and financial resource	Supports provided through SEAI
	Implementing body	SEAI
	Monitoring authority	SEAI
Energy savings	Method for monitoring / measuring the resulting savings	Where SME's participate in focussed training estimated energy usage is tracked. Where capital supports are provided savings are measured with M&V measure post implementation.
	Savings achieved in 2016	194
	Expected energy savings in 2020	230
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		Existing

E1		Smart Meter Rollout
Description	Relevant EED Article(s)	Articles 9, 11
	Category	Energy Supply.
	Timeframe	Post 2020
	Aim/brief description	To facilitate improved energy efficiency by empowering consumers with more detailed, accurate and timely information regarding their energy consumption and costs – empowering them to reduce consumption, spend and emissions. To be rolled out nationally from 2021 subject to the results of a Cost Benefit Analysis (CBA) due at year end 2017.
	Target end use	Domestic and SME electricity and gas end uses
	Target group	Domestic and SME
	Regional application	N/A
	Information on Implementation	List and description of energy saving actions substantiating the measure
Budget and financial resource		Like any energy infrastructure development, the Smart Metering Project is funded via the Regulator's Price Review process. The costs are approved by the Regulator and charged by ESB Networks and Gas Networks Ireland to energy supply companies, who in turn usually include these costs in the standing charges on customer bills.
Implementing body		CER
Monitoring authority		CER
Energy savings	Method for monitoring/measuring the resulting savings	Estimated savings are based on 3% (PEE) of baseline projections for total final consumption of household electricity to 2020.
	Savings achieved in 2016	0
	Expected energy savings in 2020	0
	Assumptions	
	Overlaps, multiplication effect, synergy	There are no overlaps associated with this measure.
Status		Potential

E2		Energy Efficiency in Electricity Transmission and Distribution
Description	Relevant EED Article(s)	Article 15
	Category	Energy Supply
	Timeframe	January 2008 and ongoing.
	Aim / brief description	Upgrades to the transmission and distribution networks to improve efficiency
	Target end use	Transmission and distribution
	Target group	Transmission System Operator (TSO) and Distribution System Operator (DSO).
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Measures to improve efficiency include Placing targets for reduced losses on the TSO
	Budget and financial resource	Any financial or budgetary requirements are included within the Single Electricity Market and the regulated revenues of the TSO and DSO.
	Implementing body	Department of Communications, Climate Action and Environment(DCCA), the Commission for Energy Regulation (CER)
	Monitoring authority	Department of Communications, Climate Action and Environment(DCCA), the Commission for Energy Regulation (CER)
Energy savings	Method for monitoring / measuring the resulting savings	Losses reduction targets set by the CER. Forecasted electricity demand to 2020 used to calculate energy savings based on percentage reduction of losses.
	Savings achieved in 2016	279 GWh PEE
	Expected energy savings in 2020	279 GWh PEE
	Assumptions	Key assumptions/statistics informing the monitored and projected savings are: • Forecasted electricity demand
	Overlaps, multiplication effect, synergy	There is no potential for overlaps. There may be synergies with electricity demand side management measures promoting load shifting and load reduction.
Status	Existing	

E3		Energy Efficiency in Power Generation
Description	Relevant EED Article	Article 15
	Category	
	Timeframe	Start: 1st January 2008 End: - Ongoing Major changes foreseen, improvements: None
	Aim / brief description	Investment in new, efficient power generation plant and RES
	Target end use	Power generation
	Target group	Electricity generators.
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Measures to improve efficiency include: <ul style="list-style-type: none"> • Promoting and prioritising energy efficiency in investment decisions for new generation plant • Promoting competition in the All-Island Single Electricity Market • Providing incentives to encourage large energy users to reduce peak energy use
	Budget and financial resource	Any financial or budgetary requirements are included within the Single Electricity Market.
	Implementing body	Department of Communications, Climate Action and Environment(DCCA), the Commission for Energy Regulation (CER)
	Monitoring authority	DCCA / CER
Energy savings	Method for monitoring / measuring the resulting savings	Primary energy use in electricity generation is forecast annually based on a model of future electricity demand and power station dispatch. Energy savings are calculated based on improvements in efficiency of the generation stock since 2008 (base year). Ex-post savings have been monitored by populating the model with statistical activity data collected by SEAI (EPSSU) for the annual energy balance.
	Savings achieved in 2016	3000
	Expected energy savings in 2020	5000
	Assumptions	Key assumptions/statistics informing the monitored and projected savings are: <ul style="list-style-type: none"> • New capacity in fossil fuel and renewable electricity generation • Level of electricity imports and exports
	Overlaps, multiplication effect, synergy	There is no potential for overlaps. There may be synergies with electricity demand side management measures promoting load shifting and load reduction.
Status	Existing	

T1		Vehicle Registration Tax (VRT) and Annual Motor Tax (AMT) Rebalancing
Description	Relevant EED Article(s)	Article 19
	Category	Transport
	Timeframe	2008 - to date
	Aim/brief desc.	The measure was a fundamental shift in the Vehicle Registration Tax and Annual Motor Tax regime whereby vehicles have been taxed on the basis of their CO2 emission levels since 1st July 2008.
	Target end use	Private cars
	Target group	General population
	Reg. application	N/A
Information on Implementation	List & description of energy saving actions	Seven bands, ranging from A-G, of specific CO2 emissions were defined and all new cars are categorised within these bands. VRT and AMT are then applied according to the cars specific CO2 emission categorisation.
	Budget and financial resource	The measure is a reweighting of VRT and AMT to favour more energy efficient cars. As such it was designed to be largely revenue neutral.
	Implementing body	Department of Finance
	Monitoring auth.	SEAI
Energy savings	Method for monitoring / measuring the resulting savings	Energy savings are evaluated and predicted based on a bottom up model of the private vehicle stock, efficiency (specific energy consumption) and activity. Future savings are based projections of vehicle stock composition and activity based on projections of key economic indicators (GDP, disposable income). Ex post savings are monitored by populating the model with statistical activity data collected by state agencies: <ul style="list-style-type: none"> • New car registrations (Central Statistics Office) • Disaggregated passenger car vehicle stock (Department of Transport, SEAI EPSUU) • Specific Energy Consumption of new cars (SEAI EPSUU) • Distance travelled by private cars (SEAI EPSUU based on National Car Test odometer data)
	Savings achieved in 2016	1048 GWh PEE 1048 GWh Final Energy Savings
	Expected energy savings in 2020	1071 GWh PEE 1071 GWh Final Energy Savings
	Assumptions	Key assumptions/statistics informing the monitored and projected savings are: <ul style="list-style-type: none"> • Specific Energy Consumption of the reference (2008) private car stock • Composition of car stock and SEC of new cars • Vehicle activity data
	Overlaps, multiplication effect, synergy	There is potential for double counting of savings attained through the various measures that target private car use; however, the energy savings from each measure are applied sequentially, thereby accounting for the impact of each measure prior to saving of the next measure. The trajectory for improvement in new car efficiency under this measure is taken to be an early and accelerated improvement in efficiency compared to the improvement trajectory on the basis of EU regulation.
Status	Existing	

T2		Electric Vehicle Deployment
Description	Relevant EED Article(s)	Articles 12, 19
	Category	Transport
	Timeframe	2011 - to date
	Aim / brief description	Grant support for new electric vehicles.
	Target end use	Private cars
	Target group	General population
	Regional application	N/A
Information on Implementation	List & description of energy saving actions ...	Specific measures towards this target include: <ul style="list-style-type: none"> • information campaigns • installation of the charging infrastructure and • €2,000 - €5,000 grant for new purchases of electric cars to stimulate activity. A list of qualifying electric vehicles and dealers will be published prior to the launch of the grant scheme.
	Budget and financial resource	Funding via the SEAI, with the funding allocation year to year. The funding allocation for 2017 is €5m.
	Implementing body	SEAI/DCENR
	Monitoring authority	SEAI/DCENR
Energy savings	Method for monitoring / measuring the resulting savings	New electric vehicles purchase under the grant scheme will be recorded by SEAI as part of the grant administration process. Total electric vehicle registrations are recorded by the CSO as part of the new vehicle registration statistics set. An electric vehicle uptake rate to 2020 has been modelled and the savings are predicted and monitored on the basis of the accelerated uptake stimulated by the measure. The impact of the increased uptake of electric vehicles is predicted based on projected uptake rates and monitored on the basis of actual uptake rates.
	Savings achieved in 2016	7 GWh PEE 7 GWh Final Energy Savings
	Expected energy savings in 2020	63 GWh PEE 63 GWh Final Energy Savings
	Assumptions	Key assumptions include: <ul style="list-style-type: none"> • Uptake rate for 20,000 electric vehicles by 2020 and reference 'no action' uptake • Specific energy consumption of electric vehicles • Primary energy factor for electricity
	Overlaps, multiplication effect, synergy	The replacement of an increasing proportion of the private car fleet with electric vehicles is accounted for in the bottom up private car fleet and energy consumption model and the impact of other measures targeted at the sector reduced accordingly.
Status	Existing	

T3		Improved Fuel Economy of Private Car Fleet (EU Regulation)
Description	Relevant EED Article(s)	Articles 3 & 19
	Category	Transport
	Timeframe	Jan 2012 to date
	Aim / brief description	The EU, through Regulation 443/2009 has mandated an improvement in average new car efficiency to 130 g CO ₂ /km by 2015 with a target of 95 g CO ₂ /km for 2020
	Target end use	Private cars
	Target group	General population
	Reg. applic.	N/A
Information on Implementation	List and description of energy saving	N/A
	Budget and fin	N/A
	Implementing body	European Commission
	Monitoring Athy.	European Commission
Energy savings	Method for monitoring / measuring the resulting savings	<p>Energy savings are evaluated and predicted based on a bottom up model of the private vehicle stock, efficiency (specific energy consumption) and activity. Future savings are based projections of vehicle stock composition and activity based on projections of key economic indicators (GDP, disposable income). Ex post savings are monitored by populating the model with statistical activity data collected by state agencies:</p> <ul style="list-style-type: none"> • New car registrations (Central Statistics Office) • Disaggregated passenger car vehicle stock (Department of Transport, SEAI EPSUU) • Specific Energy Consumption of new cars (SEAI EPSUU) • Distance travelled by private cars (SEAI EPSUU based on National Car Test odometer data)
	Savings achieved in 2016	Primary energy 1,833 GWh
	Expected energy savings in 2020	Primary energy 3,842 GWh
	Assumptions	<ul style="list-style-type: none"> • Specific Energy Consumption (SEC) of the reference (2008) private car stock • Composition of car stock and SEC of new cars • Vehicle activity data
	Overlaps, multiplication effect, synergy	<p>There is potential for double counting of savings attained through the various measures that target private car use. The energy savings from each measure are calculated sequentially in the model so that the sum of savings attributable to all measures is the total energy saving target for the sector. Both this measure and the National tax incentive measure affect the specific emissions and energy consumption of the private car fleet. The savings ascribed to each are on the basis of a trajectory of improved efficiency due to the EU regulation and an accelerated trajectory for the National tax incentive. The sum of the savings for each measure is the total saving due to improved efficiency in the national private car fleet. This measure has the effect of ensuring a trajectory of improved car fleet efficiency in line with EU policy. The effect of the National Tax measure incentive is to accelerate this effect in the short term. The savings outlined here are based on an assessment of the savings that would result from EU policy without the additional measure of taxation rebalancing.</p>
Status	Existing	

T4		Improved Fuel Economy of Light Commercial Vehicles (EU Regulation)
Description	Relevant EED Article(s)	Art 3
	Category	Transport
	Timeframe	Jan 2017 - to date
	Aim / brief description	The EU, through Regulation 510/2011 has mandated an improvement in average new light commercial vehicles efficiency to 175 g CO2/km by 2017 with a target of 147 g CO2/km for 2020
	Target end use	Light commercial vehicles
	Target group	General population
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	N/A
	Budget and financial resource	N/A
	Implementing body	European Commission
	Monitoring authority	European Commission
Energy savings	Method for monitoring / measuring the resulting savings	<p>Energy savings are evaluated and predicted based on a bottom up model of the LGVs stock, efficiency (specific energy consumption) and activity.</p> <p>Future savings are based projections of vehicle stock composition and activity based on projections of key economic indicators (GDP, disposable income).</p> <p>Ex post savings are monitored by populating the model with statistical activity data collected by state agencies:</p> <ul style="list-style-type: none"> • New car registrations (Central Statistics Office) • Disaggregated passenger car vehicle stock (Department of Transport, SEAI EPSUU) • Specific Energy Consumption of new cars (SEAI EPSUU) • Distance travelled (SEAI EPSUU based on National Car Test odometer data)
	Savings achieved in 2016	24 GWh PEE 24 GWh Final Energy Savings
	Expected energy savings in 2020	115 GWh PEE 115 GWh Final Energy Savings
	Assumptions	<p>Key assumptions/statistics informing the monitored and projected savings are:</p> <ul style="list-style-type: none"> • Specific Energy Consumption (SEC) of the reference LGV stock • Composition of car stock and SEC of new cars • Vehicle activity data
	Overlaps, multiplication effect, synergy	N/A
Status	Existing	

T5		Public Transport Efficiency
Description	Relevant EED Article(s)	Article 19
	Category	Transport
	Timeframe	Start: 2009 – date
	Aim / brief description	The aim of the measure is to promote efficiency in the public transport system including: <ul style="list-style-type: none"> • Eco-driving in buses • Efficiency in suburban electric rail • Efficiency in national rail network
	Target end use	Public transport fleet
	Target group	Public transport operators
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	"The semi-state CIE group of public transport companies generate around 230 million passenger journeys by bus each year, and over 40 million passenger journeys by rail. Since 2009 a range of programmes aimed at improving energy efficiency have taken place: <ul style="list-style-type: none"> • Eco-driving within Dublin Bus and Bus Éireann • Diesel trains in the Irish Rail fleet have cut their fuel use by up to 6% through more efficient schedules and automatic train engine shutdowns; • Electric trains in the Dublin area are saving over 20% as a result of a switch to lower voltage supply and regenerative braking technologies."
	Budget and financial resource	N/A
	Implementing body	Irish Rail, Bus Éireann, Dublin Bus
	Monitoring authority	Irish Rail, Bus Éireann, Dublin Bus, SEAI
Energy savings	Method for monitoring / measuring the resulting savings	SEAI Measuring and Reporting Framework
	Savings achieved in 2016	310 GWh
	Expected energy savings in 2020	310 GWh
	Assumptions	Energy savings are evaluated based on reported data to SEAI from public transport operators
	Overlaps, multiplication effect, synergy	N/A
Status	Existing	

T6		Aviation Efficiency
Description	Relevant EED Article(s)	Article 3
	Category	Transport
	Timeframe	2008 - to date
	Aim / brief description	The aim is to increase operational efficiency in aviation through international co-operation in air space control. The Irish and UK National Supervisory Authorities (NSAs) created the UK-Ireland Functional Airspace Block in
	Target end use	Aviation
	Target group	Aviation - NSAs
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	N/A
	Budget and financial resource	N/A
	Implementing body	Irish Aviation Authority and UK National Air Traffic Services
	Monitoring authority	Irish Aviation Authority and UK National Air Traffic Services
Energy savings	Method for monitoring / measuring the resulting savings	As per the annual report on the UK-Ireland FAB issued by the Irish Aviation Authority and UK National Air Traffic Services
	Savings achieved in 2016	253 GWh PEE 253 GWh Final Energy Savings
	Expected energy savings in 2020	253 GWh PEE 253 GWh Final Energy Savings
	Assumptions	Energy savings are evaluated based on reported data from the Irish Aviation Authority and UK National Air Traffic Services
	Overlaps, multiplication effect, synergy	
Status	Existing	

T7		Carbon Tax (transport)
Description	Relevant EED Article(s)	Not particular to any one EED Article but contributes to achievement of overall target – Article 3.
	Category	Transport
	Timeframe	2008 - to date
	Aim / brief description	Incorporate a price signal for carbon on the non-ETS sector
	Target end use	Fuel based heating and transport
	Target group	Cross sectoral (Household, industry, commercial, agriculture and transport sectors)
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Tax applied to fuels for heating and transport.
	Budget and financial resource	Administrative costs.
	Implementing body	Revenue – Irish Tax and Customs
	Monitoring authority	Revenue – Irish Tax and Customs
Energy savings	Method for monitoring / measuring the resulting savings	Estimation is made on the basis of price elasticity for the various fuels impacted. These are applied to demand scenarios that take account of the impact of all other NEEAP measures.
	Savings achieved in 2016	1300 GWh PEE 1300 GWh Final Energy Savings
	Expected energy savings in 2020	1300 GWh PEE 1300 GWh Final Energy Savings
	Assumptions	
	Overlaps, multiplication effect, synergy	Estimate applied to demand scenarios where all NEEAP measure impacts have been applied.
Status	Existing	

X1		Energy Efficiency Obligation Scheme
Description	Relevant EED Article(s)	Article 7
	Category	Cross Sectoral (Horizontal)
	Timeframe	2014-2020
	Aim / brief description	Energy Supplier Obligation (ESO): In accordance with Article 7, Ireland will implement an Energy Supplier Obligation with an annual target currently set at 550GWh per annum.
	Target end use	All end-uses
	Target group	All end users of energy
	Regional application	No
Information on Implementation	List and description of energy saving actions substantiating the measure	In accordance with Article 7, an Energy Efficiency Supplier Obligation is in place for the period 2014-2020 requiring energy suppliers above a certain threshold to achieve annual savings of 550GWh.
	Budget and financial resource	N/A
	Implementing body	DCCAIE
	Monitoring authority	SEAI
Energy savings	Method for monitoring / measuring the resulting savings	Measurement and Verification by SEAI as per EED
	Savings achieved in 2016	894 GWh
	Expected energy savings in 2020	2229 GWh
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status		Existing

X2		Renewable Energy Feed-in-Tariff (REFIT) 3
Description	Relevant EED Article(s)	Not specific to one EED Article but expected to contribute to achievement of overall target – Article 3.
	Category	Cross Sectoral
	Timeframe	Expires on 31/12/2030
	Aim/brief description	REFIT 3 is a market support scheme designed to incentivise the addition of 310MW of renewable electricity capacity to the Irish grid. Of this, 185MW will be High Efficiency CHP (HE CHP), using both Anaerobic Digestion and the thermo-chemical conversion of solid biomass, while 125MW will be reserved for biomass combustion and biomass co-firing.
	Target end use	Electricity demand in private and public sectors
	Target group	Business and public sectors
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	Combined Heat and Power (CHP) plants utilise electrical and thermal energy from the fuel input, and in principle achieve higher efficiencies than fossil fuel combustion plants. The greater efficiencies depend on the heat and electricity generation efficiency and the utilisation of the heat generated.
	Budget and financial resource	The scheme is funded by means of a Public Service Obligation (PSO).
	Implementing body	DCCAE/CER
	Monitoring authority	DCCAE
Energy savings	Method for monitoring/measuring the resulting savings	To avail of the higher tariffs, a plant must be certified as High Efficiency CHP (HECHP) by the Commission for Energy Regulation (CER) based on two criteria as follows: <ul style="list-style-type: none"> • The plant must achieve 10% Primary Energy Savings, meaning the process of generating the heat and electricity as a combined process must be 10% more efficient than generating the products through two separate processes (i.e. through a separate heat boiler and electricity generator). • The overall efficiency of the plant is assessed based on its actual performance, by comparing the electricity generated and heat utilised from the plant with the fuel consumed on an annual basis. If the overall efficiency is greater than 75%, all of the electricity it generates qualifies for support at the higher rate. If this threshold is not achieved a proportion of electricity, calculated based on high efficiency performance, is paid at the higher rate and the remainder is supported at the standard combustion rate.
	Savings achieved in 2016	0
	Expected energy savings in 2020	TBD
	Assumptions	
	Overlaps, multiplication effect, synergy	There are no overlaps with other measures. There will be a multiplier effect through the wider deployment of these technologies.
Status		Existing

X3		Behavioural Economics Unit
Description	Relevant EED Article(s)	Not particular to any one EED Article but contributes to achievement of overall target – Article 3.
	Category	Cross Sectoral (horizontal)
	Timeframe	From 2017
	Aim / brief description	The work programme aims to improve uptake of SEAI's energy efficiency programmes. In particular, the programme intends to better understanding the context in which people make decisions; use the latest research in behavioural science; and test interventions, through for example pilots, using rigorous and evidence based methodologies to determine the effectiveness of interventions before they are scaled.
	Target end use	Individual home-owners, business and communities.
	Target group	Individual home-owners, business and communities.
	Regional application	N/A
Information on Implementation	List and description of energy saving actions substantiating the measure	<p>The unit will trial and test interventions including how best to communicate effectively with target groups to achieve the desired outcomes and will assess impacts.</p> <p>The Behavioural Economics Unit will develop interventions to improve the uptake of SEAI's energy efficiency programmes for individual homeowners, businesses and communities. In addition, the new Unit will provide input to policy development and coordinate with the use of this discipline across wider government policy formation.</p>
	Budget and financial resource	New Unit to be resourced with 3 staff.
	Implementing body	SEAI
	Monitoring authority	SEAI/DCCAIE
Energy savings	Method for monitoring / measuring the resulting savings	The interventions designed by this new Unit will be rigorously and transparently evaluated to support scale-up where appropriate. This will include, but not be limited to, randomised controlled trials, that seek to measure the behavioural impact of policy interventions.
	Savings achieved in 2016	0
	Expected energy savings in 2020	28 GWh PEE 24 GWh Final Energy Savings *(need to check)
	Assumptions	
	Overlaps, multiplication effect, synergy	
Status	New – Approved.	