

Assessment of climate change policies as part of the European Semester

Country Report Ireland

16 January 2015

A report submitted by ICF Consulting Services
in association with
Ecologic Institute, Berlin and eclareon GmbH
to DG Climate Action

ICF Consulting Services Limited
Watling House
33 Cannon Street
London
EC4M 5SB
T +44 (0)20 3096 4800
F +44 (0)20 3368 6960
www.icfi.com

Document Control

Document Title	Assessment of climate change policies as part of the European Semester: Country Report Ireland
Job No.	30300170
Prepared by	Isabella Neuweg, ICF International (lead author), Georgios Marilou, eclareon GmbH (contributing author)
Checked by	Checked by Katharina Umpfenbach, Ecologic Institute
Date	28 November 2014
First point of contact	Lena Ruthner, ICF International Watling House 33 Cannon Street London EC4M 5SB Lena.Ruthner@icfi.com

This final draft report (the “Report”) has been prepared by ICF Consulting Ltd (“ICF”) and its subcontractors for DG Climate Action (the “Client”) and does not necessarily represent the Commission’s view. The Report is based on the data which was publicly available at the time of its delivery by ICF and ICF shall not be held liable for any change, update or any other alterations of this data after delivery.

The report is building on the country reports and other documents prepared by Ecologic Institute and eclareon for the Directorate General for Climate Action (DG CLIMA) under Service Contract: 071201/2012/635684/SER/CLIMA.A.3.

This report is the copyright of the Client. The contents of this Report may not be reproduced in whole or in part, nor passed to any other organisation or person without the specific prior written permission of the Client.

ICF and its subcontractors have used reasonable skill and care in checking the accuracy and completeness of information supplied by the Client or third parties in the course of this project under which the Report was produced. ICF is however unable to warrant either the accuracy or completeness of such information supplied by the Client or third parties, nor that it is fit for any purpose. ICF does not accept responsibility for any legal, commercial or other consequences that may arise directly or indirectly as a result of the use by ICF of inaccurate or incomplete information supplied by the Client or third parties in the course of this project or its inclusion in this report.

Contents

- Document Controlii**
- 1 Short Summary.....2**
- 2 Climate and energy policy priorities2**
- 3 GHG trends and projections3**
- 4 Policy development5**
- 4.1 Key policies as outlined in the National Reform Programme 5**
- 4.2 National policy priorities 7**
- 4.2.1 Environmental Taxation 8
- 4.2.2 Energy Efficiency 8
- 4.2.3 Renewable Energies 9
- 4.2.4 Transport 11
- 4.2.5 Agriculture 12
- 5 Policy progress against Country Specific Recommendations (CSRs) issued 2013 ...13**
- References15**

1 Short Summary

By 2020, Ireland needs to reduce its emissions not covered by the EU ETS by 20% compared to 2005, according to the Effort Sharing Decision (ESD). The latest data for 2013 show that Ireland not only met but exceeded its annual allocation interim target under the ESD for the year 2013 by 7.9 percentage points. Going forward, however, national projections indicate that the country will miss its 2020 target with existing measures or additional measures, especially due to projected emission pathways for the agricultural and transport sectors.

In its Green Paper, released on 12 May 2014, Ireland sets out the underlying goals of its energy policy as securing energy supply, ensuring competitiveness, adhering to environmental responsibility and creating jobs and enterprise development. Ireland is currently in the process of setting out and streamlining its low carbon transition to 2050. It has expressed its National Policy Position and plans a Climate Action and Low-Carbon Development Bill. The ultimate objectives of the Bill are to enable Ireland to meet its legally binding non-ETS emissions reduction 2020 target (and any other new EU and international obligations) and achieve a low carbon transition to 2050 (Environment, Community and Local Government, 2014). It mandates the development of a National Low-Carbon Roadmap to 2050, which will incorporate several sectoral roadmaps. The key sectors are electricity generation, the built environment, transport and agriculture. A primary objective of the national roadmap is to bring a clear and strong focus on both the challenges and the opportunity of transition to a successful low-carbon future. Currently, Departments with responsibility for the key sectors in the national transition agenda are preparing the sectoral roadmaps for incorporation into the national roadmap.

In order to achieve its renewable energy target of 16% by 2020, Ireland has set an internal target to meet 40% of electricity demand from renewable sources, with 10% for transport and 12% for heat. In 2013, Ireland was approximately half way towards each of those targets (Howley et al. 2014), i.e. renewables accounted for 20.9% of gross electricity consumption in 2013¹ (Ibid.). Ireland also has commitments to achieve a 20% increase in energy efficiency by 2020 (Anon., 2014) and a 33% reduction in public sector energy use by 2020 (Department of Communications, 2014). It has issued a balanced approach to stimulate energy efficiency measures in buildings and commercial applications, i.e. Ireland's retrofit programs have led to energy efficiency upgrades in 261,000 homes to date (Department of Communications, Energy and Natural Resources 2014f). Nevertheless, while some progress has been achieved in improving energy efficiency, Ireland needs to step up its efforts to reach its 2020 target for energy efficiency (EEA 2013).

An Energy Efficiency Fund was launched in March 2014 and will support energy efficiency measures with 70 million EUR, half of it provided by the Irish Government. Through its Better Energy programme Ireland aims to spur energy retrofits in buildings. In 2015, the scheme will be continued with a budget of 47 million EUR to realise energy savings of 460 GWh, reduce emissions by 115 kt CO₂ and support 2,900 jobs (Service, 2014).

With the release of a National Bioenergy Plan on 8 July 2014, Ireland proposed a number of supply, demand and R&D measures to increase the use of biomass by 2020. This will be a cross-departmental effort and involve setting up a Bioenergy Steering Group. In addition, 10 million EUR has been allocated in 2015 to ocean energy research, development and demonstration, following the publication of the Offshore Renewable Energy Development Plan in February 2014 (Service, 2014).

2 Climate and energy policy priorities

Ireland has targets to **reduce emissions in the non-ETS sectors by 20%** compared to 2005 levels and to increase the share of renewables in final energy consumption to 16% by 2020 (Anon., 2014). In order to achieve its renewable energy target, **Ireland is committed to meeting 40% of electricity demand from renewable sources, with 10% for transport and 12% for heat.** Ireland also has commitments to achieve a **20% increase in energy efficiency by 2020** (Anon., 2014) and a 33% reduction in public sector energy use by 2020 (Department of Communications, 2014).

¹ Effects of climatic variation are smoothed through the use of a normalisation rule for wind and hydro according to Article 30 and Annex II of Directive 2009/28/EC on the promotion of the use of energy from renewable sources

In its **Green Paper**, released on 12 May 2014, Ireland sets out the underlying goals of its energy policy as securing energy supply, ensuring competitiveness, adhering to environmental responsibility and creating jobs and enterprise development. The Green Paper precludes a **White Paper** which will set out a detailed energy policy for Ireland. The development of the White Paper was initiated in September 2014 and is expected to be finalised in September 2015. It will be used as input to the EU's 2030 Framework for Climate and Energy policies and to the UNFCCC COP21 in 2015.

With 6.7 billion EUR spent on energy imports in 2013 (Howley, et al., 2014), Ireland can benefit hugely from improving energy efficiency, balancing demand and increasing generation from renewable resources. While Ireland relies on gas (44%) and coal (18%) for its energy generation, already 30% of total energy generation is derived from renewables of which wind contributed 26% of Ireland's energy generation in 2013 (Commission for Energy Regulation & Utility Regulator, 2014).

With extensive potential for greater wind generation and development of ocean energy, the need to balance intermittency and explore storage solutions is of particular relevance for Ireland. The roll-out of smart meters (starting in 2016 and planned for completion before 2020) also has a large contribution to make to improving grid management and providing a mechanism to facilitate new technologies. **10 million EUR has been allocated in 2015 to ocean energy** research, development and demonstration, following the publication of the **Offshore Renewable Energy Development Plan** in February 2014 (Service, 2014).

An **Energy Efficiency Fund** was launched in March 2014 and will support energy efficiency measures with 70 million EUR, half of it provided by the Irish Government. Through its **Better Energy programme** Ireland aims to spur energy retrofits in buildings. In 2015, the scheme will be continued with a budget of **47 million EUR to realise energy savings of 460GWh, reduce emissions by 115 kt CO₂ and support 2,900 jobs** (Service, 2014).

With the release of **National Bioenergy Plan on 8 July 8 2014**, Ireland proposed a number of supply, demand and R&D measures to increase the use of biomass by 2020. This will be a cross-departmental effort and involve setting up a Bioenergy Steering Group. The Plan also recommends the continuation of existing bioenergy measures such as a **Feed-In-Tariff for electricity generation from biomass, including co-firing with peat, and the Biofuel Obligation Scheme which mandates the use of biofuels in road transport fuel** (Department of Communications, 2014).

Ireland spent 3.5 billion EUR importing fossil fuels for transport in 2013 and with 33% transport accounted for the largest share of primary energy demand of the Irish economy in 2013 (Dineen, et al., 2014). Ireland's transport energy consumption per capita is the fifth highest in Europe, 30% above the EU average (Dineen, et al., 2014). An action plan of 40 measures, set out in the Government's transport policy for the period 2009 – 2020, *Smarter Travel – A Sustainable Transport Future*, is the framework under which energy and emissions savings will be achieved in the sector. With this plan, the Government wants to achieve that the car share of total commutes drops from 65% to 45% by 2020.

Given that the agricultural sector is the largest single contributor to Ireland's GHG emissions, the recently published National Policy Position on Climate Action and Low-Carbon Development has highlighted this problem and emphasised that National Low-Carbon Roadmaps will be developed in an iterative process also in the agricultural sector. This should include an approach to carbon neutrality for agriculture, which does not compromise capacity for sustainable food production. Ensuring a coherent and cost-effective approach to the twin challenge of sustainable food production and climate change in the agricultural sector is noted as a particularly important issue for the development of climate policy in Ireland (NPP Ireland, 2014).

3 GHG trends and projections

Ireland reduced its total GHG emissions by 19% between 2005 and 2013, and since 2010 emissions have stagnated. The share of GHG emissions not covered by the European Emission Trading Scheme (EU ETS) is around 72%, which is above the EU28 average (see Table 1).²

² The European Environment Agency has developed a complex methodology to measure progress on the Non-ETS/ESD targets of all EU Member States. This report uses the figures derived on this basis. A detailed

Table 1 Key data on GHG emissions

		National data				EU28
		2005	2011	2012	2013	2013
Total GHG emissions	Mt CO ₂ eq	69.7	57.7	58.5	56.6	4 539
Non-ETS emissions	Share in total emissions	68%	73%	71%	72%	58%

Source: EEA 2014a; EEA 2014c

By 2020, Ireland needs to reduce its emissions not covered by the EU ETS by 20% compared to 2005, according to the Effort Sharing Decision (ESD). The latest data for 2013 show that Ireland not only met but exceeded its annual allocation interim target under the ESD for the year 2013 by 7.9 percentage points (see figures Table 2). Going forward, however, national projections indicate that the country will miss its 2020 target by about 16.9 percentage points with existing measures (WEM) and by about 10 percentage points with additional measures (WAM) (EEA 2014a).

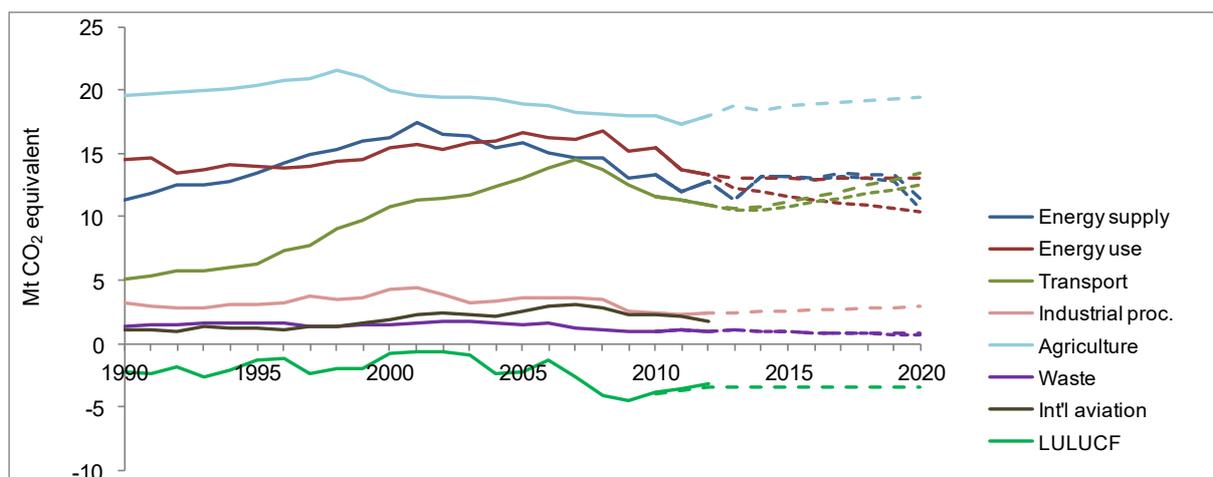
Table 2 Non-ETS emission targets, trend and projections

		Compared to base year
2013	ESD interim target	- 3.7%
	ESD emissions	- 11.6%
2020	ESD target	- 20.0%
	ESD projections WEM	- 3.1%
	ESD projections WAM	- 10.0%

Source: EEA 2014a. Green indicates target met or exceeded, orange indicates a value below.

GHG emissions are mainly created by the agricultural sector followed by direct fuel consumption (e.g. households for heat generation) and the energy industry. Projections indicate that by 2020 emissions from the agricultural sector will increase by 9% while emissions from direct fuel consumption are expected to remain relatively constant. Emissions from the energy industry will fluctuate but eventually decrease; this means that they will be below transport emissions by 2020. Transport emissions are projected to increase 15-23% on current levels over the period to 2020 depending on the level of policy implementation (Environmental Protection Agency, 2014).

Figure 1 GHG trends and projections by sector



Source: EEA 2014a. Dashed lines indicate the WEM projection, dotted lines the WAM projection.

4 Policy development

This section covers significant developments made in key policy areas between January and December 2014. It does so through two different perspectives: 1) progress on the policies communicated under the National Reform Programme and 2) developments in the identified national priority sectors and policy areas.

4.1 Key policies as outlined in the National Reform Programme

Member States prepare National Reform Programmes (NRPs) each April outlining the country's progress and the key policies and measures to achieve targets under the EU 2020 Strategy. These key policies and measures are summarised in the following table and their current status is provided.

Table 3 Key policies and measures as outlined by the NRP 2014

New Rural Development Programme	
Status in the NRP	Ireland flags its concern about meeting the 2020 GHG reduction targets due to its projected agricultural emissions. The new Rural Development Programme (RDP) for the period 2014-2020 will encompass the themes of technology, efficiency and sustainability.
Status as per Dec 2014	In preparation
Description of policy	See section 4.2.6
Offshore Renewable Energy Development Plan	
Status in the NRP	Launched
Status as per Dec 2014	Initiation on 7 February 2014 Funding for 2015 for tidal R&D committed
Description of policy	See section 4.2.3

National Low Carbon Roadmap and Climate Action and Low Carbon Development Bill	
Status in the NRP	National Low-Carbon Roadmap to 2050 under development Announced that later in 2014, public consultation on the draft National Low-Carbon Roadmap to 2050 and draft Strategic Environmental Assessment is expected to take place
Status as per Dec 2014	Initiation of the public consultation on the sectoral roadmap for low-carbon built environment on 23 April 2014 Draft National Low-Carbon Roadmap to 2050 and draft Strategic Environmental Assessment not released, yet.
Description of policy	See section 4.2 and 4.2.2

Biofuel Obligation scheme	
Status in the NRP	Implemented
Status as per Dec 2014	Implemented
Description of policy	See 4.2.4

REFIT 3	
Status in the NRP	Further targeted measures on supporting renewable heat are being considered in the context of the forthcoming Bioenergy Strategy
Status as per Dec 2014	Implemented
Description of policy	See section 4.2.3

Better Energy Programme and other energy efficiency support measures	
Status in the NRP	A new energy saving target is to be set for the period 2014 – 2017. The programme is moving from grant-based to other sources of financing. A number of initiatives are under development including the recent launch of an Energy Efficiency Fund, the publication of a National Energy Performance Contracting Policy Framework and a suite of Exemplar Projects.
Status as per Dec 2014	Funding of Better Energy Programme extended to 2015 Launch of Energy Efficiency Fund in March 2014 Accelerated Capital Allowance scheme extended to 2017
Description of policy	See section 4.2.2

Green and White Paper on Energy Policy	
Status in the NRP	It is stated that Ireland's energy policy needs to be re-evaluated and updated taking into account present circumstances, such as changes in economic conditions and public finances. It is announced that the Department for Communications, Energy and Natural Resources (DCENR) will publish a Green Paper on Energy Policy to stimulate a broad and informed debate about Ireland's future energy policy.
Status as per Dec 2014	The Green Paper has been published on 12 May 2014 and several consultations have been launched. Preparations for the launch of the new White Paper are in progress in the first quarter 2015 and it is expected to be finalised at the end of the second quarter of 2015. Initiation of the Public Consultation on Energy Policy White paper on 24 September 2014
Description of policy	Ireland seeks to set out a balanced and workable energy policy framework for the next five years focussing on competitiveness, security and sustainability, economic growth and job stimulation.

National Bioenergy Plan	
Status in the NRP	Forthcoming
Status as per Dec 2014	Publication announced, but detailed Plan pending.
Description of policy	See 4.2.3

4.2 National policy priorities

Ireland is currently in the development stage of setting out and streamlining its low-carbon transition to 2050. It has expressed its National Policy Position and plans a Climate Action and Low-Carbon Development Bill. The ultimate objectives of the bill are to enable Ireland to meet its legally binding non-ETS emissions reduction 2020 target (and any other new EU and international obligations) and achieve a low carbon transition to 2050 (Environment, Community and Local Government, 2014). It mandates the development of a National Low-Carbon Roadmap to 2050, which will incorporate several sectoral roadmaps. The key sectors are electricity generation, the built environment, transport and agriculture. A primary objective of the national roadmap is to bring a clear and strong focus on both the challenges and the opportunity of transition to a successful low-carbon future (Anon., n.d.). Currently, Departments with responsibility for the key sectors in the national transition agenda are preparing the sectoral roadmaps for incorporation into the national roadmap.

The National Policy Position and Heads of the Climate Action and Low-Carbon Development Bill were published in April 2014. The National Policy Position expresses a long term vision based on an aggregate reduction in emissions of at least 80% by 2050 (from 1990 levels) in the power generation, built environment and transport sectors, coupled with "an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production" (Minister of Environment, Community and Local Government, 2014, p.2). The evolution of policy in this area will be an iterative process, based on a series of national plans over the period to 2050. Mitigation and adaptation will be addressed through the development and implementation of parallel national plans – the National Low-Carbon Roadmaps and National Climate Change Adaptation Frameworks. The Bill proposes the establishment of a national Expert Advisory Body on Climate Change which will be to conduct regular reviews of the roadmap and adaptation framework and issue recommendations to Government if the rate of progress is insufficient to meet the 2050 objectives.

The below sub-sections provide updates on key existing and new policies in priority sectors and policy areas of relevance to the energy and climate targets under the Europe 2020 strategy³. Each sector or policy area contains information on the most important policy instruments in operation or development.

4.2.1 Environmental Taxation

In Ireland the implicit tax rate on energy is close to the EU average with EUR 172 per ton of oil equivalent in 2012 (Eurostat, tsdcc360). However, the share of environmental tax revenues in overall tax revenue was 8.7% in 2012 and therefore above the EU average of 6.1% and the sixth highest in the EU (Eurostat, ten00064). When comparing environmental tax revenues with GDP, Ireland is slightly above average with 2.5% in 2012 (with the average at 2.4%) (Eurostat, ten00065).

Few environmental taxes were changed in 2014. However, the Air Travel Tax, which provides for an excise duty on departures of passengers on flights from all Irish airports has ceased to exist on April 1 2014 in order to spur tourism in Ireland (Withana, et al., 2014) (an excise duty of 3 EUR per passenger was introduced in 2008 and amended in 2009 and 2011, called Air Travel Tax, on departures of passengers on flights from Irish airports (Customs, 2014)).

The Public Service Obligation (PSO) levy, established by the Electricity Regulation Act 1999, is designed to support certain peat, gas and renewable generation plants (International Energy Agency, 2012). All final customers, regardless of the supplier, are paying this levy, and it is displayed as a separate item on consumers' electricity bills. The proceeds of the levy are used to contribute to the additional costs incurred by PSO-supported electricity generators which are not recovered in the electricity market (Commission for Energy Regulation, 2014). Costs occurring from the renewable energy feed-in-tariffs for renewables, i.e., are borne by all final energy consumers through the PSO levy. Similarly, because PSO subsidised electricity is sold at market prices, if the revenues received over-recover the levy from the market, the difference is returned to the PSO fund (IEA, 2012). The Commission for Energy Regulation is responsible for the calculation, certification and supervision of the PSO levy (Ibid.). The proposed level for 2014/2015 is high for peat (approx. 115 million EUR compared to 90 million EUR for renewables) (Commission for Energy Regulation, 2014). In previous years (2007 to 2010), however, the peat PSO was zero because peat was competitive with gas (IEA, 2012). Ireland plans to phase out the peat PSO in 2015 for one peat power plant and in 2019 for the two remaining ones. Because the phase out of the peat levy is imminent, all three peat plants are actively testing/developing co-firing peat with biomass; i.e. in one plant 130 kt of peat were replaced with carbon neutral sources in 2010 (IEA, 2012). The feed-in-tariff scheme described in 4.2.3 facilitates this.

4.2.2 Energy Efficiency

Within the EU28, Ireland has the least energy-intensive economy. Energy intensity declined by 10% from 2005 to 2012 (Eurostat, tsdec360), while the final energy consumption dropped by 15% from 2005 to 2012, with the reductions coming from all sectors (Eurostat, tsdpc320). Ireland is currently on track towards its indicative EU energy efficiency target (EEA 2014a).

In order to ensure it meets its energy efficiency target and in response to Article 7 of the EU Energy Efficiency Directive which requires member states to establish an energy efficiency obligation scheme, Ireland has introduced an obligation scheme to energy suppliers (European Union Energy Efficiency Obligation Scheme. Regulations 2014).

Given that Article 7 sets an ambitious reduction target for Ireland- equivalent to achieving new savings each year from 1 January 2014 to 31 December 2020 of 1.5% of the annual energy sales to final customers- Ireland introduced additional measures to meet this.

The Accelerated Capital Allowance (ACA) scheme provides a tax incentives to industry to encourage investment in energy efficiency equipment. Through the ACA businesses can write off 100% of the capital cost of certain energy efficient plant and machinery against corporation tax in the year of purchase (Department of Communications, n.d.). A review and cost benefit analysis of the scheme

³ The Consortium jointly with DG Clima identified these based on identified challenges in Country Profiles (EEA, 2014), share of sectors in total GHG emissions, and Country Specific Recommendations (2014). DG Clima has identified additional relevant issues to be reviewed for some or all Member States, including country specific energy challenges.

was carried out in October 2014 to assess the rationale for the scheme, evaluate its overall effectiveness and to make recommendations regarding continuation of the scheme (Department of Communications & Sustainable Energy Authority of Ireland, 2014). This resulted in the decision to extend the ACA for further three years to 31 December 2017, as announced in the 2015 Budget speech (Department of Communications, n.d.).

An Energy Efficiency Fund was launched in March 2014 and will support energy efficiency measures in the private and public sectors with 70 million EUR. Half of it is provided by the Irish government, the other half will come from private sector capital. In 2014, a UK private property investor committed 13 million EUR, a low carbon heating manufacturer invested 5 million EUR (Press Office, 2014) while the Irish government committed 17 million EUR. It is not clear if the target of 70 million EUR committed funding has been reached or by when this should be achieved. Sustainable Development Capital LLP (SDCL), a private company, acts as investment advisor. The goal is to leverage significant amounts of private capital; it is anticipated that as much as 300 million EUR leveraged funding could be delivered over the next three years (Press Office, 2014). In the first project to receive funding, an Irish energy services company will replace existing lighting across an initial seven Tesco stores with high-efficiency LEDs; there is follow-on funding commitment for up to 40 stores nationwide (Ibid.). This is expected to result in the creation of 16 new direct jobs for the energy service company and deliver estimated average annual energy cost savings of over 540,000 EUR (Ibid.). No other projects seemed to have been launched under the fund in 2014.

Through its Better Energy programme Ireland aims to spur energy retrofits in buildings. The scheme which is administered by the Sustainable Energy Authority of Ireland (SEAI) will be continued with a budget for 2015 of 47 million EUR to realise energy savings of 460GWh, reduce emissions by 115 kt CO₂ and support 2,900 jobs. At the same time, Ireland has announced changes to the scheme to move it from cash grants to a financing scheme. While the budget for the scheme has been confirmed for 2015, it is unclear until when the scheme will be continued. Nevertheless, the scheme has led to substantial take up of energy efficiency measures in homes, with every sixth home having received some form of government support under the scheme (Department of Communications, Energy and Natural Resources 2014f). In Ireland's emission projections for the residential sector the "With Additional Measures scenario" projects emissions to decrease by 30% between 2013 and 2020 to 4 Mt CO₂eq (Environmental Protection Agency 2014). Under this scenario, the Better Energy Homes scheme accounts for approximately 90% of the emission savings foreseen (Ibid.). While the level of investment might seem high compared to the expected tCO₂ reduction for 2015, the SEAI estimates that investments of 21k EUR per home would be required on average to upgrade every home in the country to a minimum Building Energy Rating of B3⁴, suggesting a total investment requirement of around 35 billion EUR (Department of Communications, Energy and Natural Resources 2014f).

Also, the Department of Environment, Community and Local Government together with the DCENR have announced on 23 April 2014 the initiation of a public consultation on the sectoral roadmap for low-carbon built environment which ran until May 2014. Both Ministries stressed the importance of designing a low-carbon vision for the sector as well as assessing and cost-effective options for delivery of that vision. The sectoral roadmap for built environment will be open for comments by stakeholders until 20 May 2014. The Irish Green Building Council (2014) suggested that the roadmap needed to widen the scope considerably to take a whole life cycle approach to the built environment and needs to include a spatial planning dimension. Given the scale of efforts required, policies need to address significant social barriers in addition to improving the economics of energy efficiency upgrades to ensure large scale uptake; addressing these social factors include education about the benefits of energy retrofits, ensuring easy access to the schemes, installations from a trusted, competent source and offering innovative financing instruments targeted to the needs of different consumers.

4.2.3 Renewable Energies

The share of renewables in gross final energy consumption was 7.2% in 2012, which is above the indicative 2012 target of 5.7% set out by the Renewable Energy Directive (RED). The average annual growth rate was 11.7% between 2005 and 2012. An annual growth rate of 14.2% is needed between

⁴ Which means emissions of 0.07 tCO₂ /m²/year according to Building Energy Rating (BER) indicators, i.e.: <http://theredwoodportfolio.com/documents/132.pdf>

2013 and 2020 to reach the 2020 target of 16% renewables in total final energy consumption (EEA 2014a). Ireland has set an internal target to meet 40% of electricity demand from renewable sources, with a 12% target for renewable heat. The share of renewable electricity generation in final electricity consumption more than doubled from 7.2% to 19.6% between 2005 and 2012, while the share of renewable heating only increased by around half from 3.5% to 5.1% (Eurostat, SHARES 2014).

The Irish Renewable Energy Feed-in-Tariff (REFIT) supports the achievement of the 40% renewable electricity target by 2020 and is managed by the Irish DCENR. The REFIT 3 scheme for biomass technologies started in February 2012 after the EU confirmed it was in line with state aid guidelines. REFIT 3 is designed to encourage additional installation of 310 MW of renewable electricity capacity to the Irish grid (Holland & Howley, 2014). Of this, 150 MW is intended to be high efficiency CHP, using both anaerobic digestion (50 MW) and thermochemical conversion of solid biomass (100 MW), while 160 MW will be reserved for biomass combustion and biomass co-firing (Ibid.). The support levels range from 12 cent per kWh to 15 cent per kWh depending on the plant size and subject to indexation (to Consumer Price Index). Support for any project will be provided for up to 15 years and will not extend beyond 2030 (Ibid.). As of October 2014, letters of offers have been issued for 104 MW of biomass CHP and 3.7 MW of anaerobic CHP, however these projects may not yet be operational (Ibid.).

The REFIT 2 scheme supports the development of 4000 MW of capacity from onshore wind, small hydro and landfill gas by December 2015. No changes to the scheme have been made in 2014. The level of support under REFIT 2 range from 6.6 cent per kWh for onshore wind to 8.3 cent per kWh for hydro, depending on the plant size and subject to indexation (to Consumer Price Index). If Ireland were to install 400 MW of wind energy by 2020, it could create up to 8,000 new jobs, thus doubling the number of jobs in the sector (Siemens, 2014). A more ambitious scenario could create up to 35,000 jobs for 12 GW of installed capacity (Ibid.). Additional investment from the private sector would need to be leveraged in order to reach these levels of capacity. These investments remain contingent upon removing barriers such as insufficient transport and port infrastructure, resistance from local communities to installations and more importantly, necessary market support in Ireland as well as in countries where electricity could be exported to, such as the UK (Ibid.).

On 7 February 2014, the DCENR announced the initiation of the Offshore Renewable Energy Development Plan (OREDP) (Department for Communications, Energy and Natural Resources 2014c). OREDP aims to provide a framework for the deployment of Ireland's offshore renewable energy resources. OREDP will be based on three pillars: environmental sustainability, technical feasibility and commercial viability. According to a Strategic Environmental Impact assessment of OREDP, it will be possible to achieve 4,500 MW from offshore wind and 1,500 MW of wave and tidal devices without significant adverse effect on the environment (Department for Communications, Energy and Natural Resources 2014d). OREDP proposes the introduction of a support scheme for tidal energy, starting in 2016. More specifically, the support scheme foresees a 26 cent per kWh support and will be limited to 30 MW for ocean (wave and tidal) energy.

Following OREDP's publication, the Irish government has announced 10 million EUR to fund tidal R&D projects in 2015 (Service, 2014). These will go towards the development of the Atlantic Marine Energy Test Site off Annagh Point in County Mayo, ongoing activity at the Galway and Mayo Test Sites, and the co-funding of the Irish Maritime and Energy Resource Cluster in Ringaskiddy, County Cork (Ibid.). The funding will also allow the SEAI to continue operation of the Prototype Development Fund which tries to stimulate industry-led projects for the development and deployment of ocean energy devices and systems (Ibid.).

Separately, the SEAI has announced on 22 April 2014 its support to the Electricity Supply Board (ESB)'s Westwave ocean feasibility project by granting 1.3 million EUR for environmental and feasibility studies (Ireland, 2014). The Westwave project expects to deploy five wave energy devices off the coast of County Clare by 2018. The project represents one of the most ambitious projects globally to develop "a pre-commercial array of wave energy converters" (Ibid.). An environmental impact assessment for the site will be carried out between 2015 and 2016 in order to ensure the project can fulfil its goal to connect power generated from the wave energy converters to the existing electricity network by 2018 (Ibid.).

However, 2014 has also seen a high-profile onshore wind project being scrapped. The Irish Minister, Pat Rabbittee, announced on 13 April 2014 the cancellation of the "Midlands Energy Export Project"

(Department of Communications, 2014). Mainstream Renewable Power and Element Power had been leading plans to install more than 1,000 turbines across the Irish midlands by 2020, with an installed capacity of 8 GW. The power generated would have been exported to the UK (Shankleman 2014). Despite the signing of a Memorandum of Understanding between the UK and the Republic of Ireland last year, no final agreement had been concluded, leading to the cancellation of the project. The failure to reach agreement resulted from legal and regulatory barriers which stalled progress. In addition, the UK side hesitated to commit to the same level of funding provided to Irish onshore developers and was considering to develop the same capacity on-site in the UK (Ibid.). In addition, Irish communities and stakeholder groups had opposed the planned project (Anon., n.d.). Ireland still hopes to be exporting electricity generated from renewables to the UK at some point (Ibid., Shankleman 2014).

According to Scheer et al. (2014) Ireland is spending EUR 1.5 billion per year on sustainable energy solutions and if the sector can profit from the arising business opportunities it can be valued as much as EUR 2.5 billion per year by 2020. This means the sector could sustain up to 30,000 jobs in comparison with 18,000 already created jobs (Ibid.). The Irish supply chain with a diverse and secure energy supply could also be a contributing factor to attract more Foreign Direct Investments in the future (Ibid.).

Publication of National Bioenergy Plan announced

The DCENR announced on 8 July 2014 the publication of the National Bioenergy Plan. The National Bioenergy Plan proposes a number of supply, demand and R&D measures to increase the use of biomass by 2020 (DCENR 2014a). Bioenergy will form an essential building block in Ireland's energy policy to 2020, 2030 and beyond (Ibid.). This will be a cross-departmental effort and involves setting up a Bioenergy Steering Group (Ibid.). The Plan also recommends the continuation of existing bioenergy measures such as the REFIT 3 including co-firing with peat, and the Biofuel Obligation Scheme which mandates the use of biofuels in road transport fuel. Importantly, the Plan includes the introduction of an Exchequer-funded Renewable Heat Incentive in 2016. Further information is not available at this point in time, even though a more detailed version of the plan was due to come out in the summer of 2014.

4.2.4 Transport

GHG emissions as well as energy consumption from the transport sector have more than doubled between 1990 and 2012 but they have been consistently decreasing since 2005. However, the proportion of transport emissions in Ireland's total emissions has increased incrementally to 18%. Average emissions for newly registered cars are low in Ireland with a level of 120.6 CO₂/km. The level is the seventh lowest in the EU and has decreased by 28% between 2005 and 2012, more than the EU average of 22% (Eurostat, tsdtr450). Fuel taxation in Ireland is above EU average. The road fuel excise duties on diesel are the fourth highest among EU MS and the excise duties on petrol are the eleventh highest (EEA 2014b).

Ireland levies a registration tax based on CO₂ emissions. The ownership tax is based on the cylinder capacity of private cars registered before 2009 and on CO₂ emissions, if registered after 2009 (ACEA 2014). Despite these measures, the uptake of electric vehicles (EVs) has been slower than expected – a common experience across the EU although significant progress has been made with respect to the deployment of publicly accessible charging infrastructure (Anon. 2014). The ESB expects 1,000 such charge points, including 60 fast charge points, to be deployed in 2014. No evidence was found on whether this was achieved in 2014. At the end of 2013 there were 420 Electric Vehicles EVs in Ireland, including 251 private cars (Dineen, et al., 2014). This represents less than 1% of the revised target for 2020 of 50,000 vehicles (Ibid.). However, there has been a significant increase in the numbers of new EVs registered in 2014, with 215 registered between January and August 2014 compared to 54 for the whole of 2013 (Ibid.). One the one hand, this is due to general rise in demand for motor vehicles and the entrance of new manufacturers and models to the market (Ibid, p.83). On the other hand, a major contributor could also be a grant scheme of up to 5,000 EUR for a Battery Electric Vehicle (BEV) or a Plug-in Hybrid Electric Vehicle (PHEV) purchased and registered before end of 2014 (SEAI 2014). The scheme is administered by the Sustainable Energy Authority of Ireland and grants are accessed via the car dealer (Ibid.). In addition, these vehicles qualify for a vehicle registration tax relief of up to 5,000 EUR for a BEV and 2,500 EUR for a PHEV, providing a maximum combined subsidy (grant + VRT relief) of 10,000 EUR for BEVs and 7,500 EUR for PHEVs (Ibid.).

An action plan of 40 measures, set out in the Government's transport policy for the period 2009 – 2020, *Smarter Travel – A Sustainable Transport Future*, is the framework under which energy and emissions savings will be achieved in the sector. With this plan, the Government wants to achieve that by 2020 the car share of total commutes drops from 65% to 45%. The National Transport Authority (NTA) is charged with devising and implementing projects to enhance sustainable travel in Ireland, in line with government policy (Ibid.). It has responsibility for capital investment in the Greater Dublin Area, and for projects that promote sustainable transport nationwide – including through the provision of funding to Iarnród Éireann, the Railway Procurement Agency and Dublin Bus (Ibid.). A significant amount of projects have been implemented, however, none in 2014. In the Climate Action and Low-Carbon Development Bill there are no transport-specific provisions. A low carbon roadmap for the transport sector will need to be devised, however, no significant developments seemed to have been made in 2014. However, in December 2013, the Department of Transport, Tourism & Sport published a consultation paper on a low-carbon roadmap for transport, which addressed engines and fuels, travel demand, modal shift as well as aviation and maritime transport (Ibid.).

Ireland will aim to meet the 10% binding target for renewable energy in transport principally through the deployment of sustainable biofuels through the Biofuel Obligation scheme (Ibid.). The obligation was increased from 4% to 6% by volume in January 2013. The weighted share of biofuels in transport energy in 2013 was 4.8% (Ibid.).

For a tax update on Air Travel see 4.2.1.

4.2.5 Agriculture

As mentioned in section 3, the agricultural sector is the largest single contributor to GHG emissions. The National Policy Position on Climate Action and Low-Carbon Development has highlighted this problem and emphasised that National Low-Carbon Roadmaps will be developed in an iterative process also in the agricultural sector. This should include an approach to carbon neutrality for agriculture, which does not compromise capacity for sustainable food production. Ensuring a coherent and cost-effective approach to the twin challenge of sustainable food production and climate change in the agricultural sector is noted as a particularly important issue for the development of climate policy in Ireland (Minister for the Environment, Community and Local Government, 2014).

Other stakeholders have also repeatedly stressed the magnitude of the challenge of reducing emissions from the Irish agricultural sector (i.e. EPA 2014, Anon., 2014, Farrelly et al. 2014). A lot of changes and policy programmes are currently underway and it will need to be carefully observed whether these can lead to the required emission reductions. Farrelly et al. (2014) in their potential environmental impact assessment of the increased food production envisaged by the Food Harvest 2020 strategy (see below) note that significant innovations and improved practises at farm levels will be required in order to meet the EU target. These should include higher uptake of best available technology at farm production level, upskilling the knowledge of advisors in relation to the environment and knowledge transfer to farmers.

Food Harvest 2020, a roadmap for the Irish agricultural sector which was released in 2010, sets out the potential growth in agricultural output after the removal of milk quotas in 2015. Although Food Harvest 2020 or “the Roadmap” was an initiative of the production and processing sectors of Irish agriculture, the document was published by the Irish Department of Agriculture, Food and the Marine (DAFM) (Farrelly et al. 2014). It is therefore an industry report rather than a national plan. Nevertheless, the preparation of the Agri-Food Strategy for the period until 2025 is being informed by the findings and recommendations of Food Harvest 2020 and seeks to build on its progress. Food Harvest 2020 also features prominently in all policy developments related to the agricultural sector.

The Agri-Food Strategy will be a short, concise document and will address key players in the sector (DAFM, n.d.b). Building on previous reports (rather than a sectoral analysis) it will outline the key actions required to ensure that the agri-food sector (primary agriculture, the food and beverage industry, fisheries and fish processing, forestry and forestry processing) maximises its contribution to overall economic growth, job creation and environmental sustainability over the coming decade and builds upon the progress achieved under Food Harvest 2020. This Strategy will be developed by a Committee of leading figures from the agri-food sector and is due to be presented to the Minister in June 2015 (Ibid.). It is unclear how exactly this strategy fits in with the Low Carbon Roadmap under development for the sector.

Food Harvest 2020 stressed that a “green” Irish agricultural sector can be a key competitive advantage, so that “Ireland can become synonymous with the production of environmentally sustainable and welfare friendly products” (Ibid., p.iii). The Roadmap also recommended the adoption and use of high technology and best production methodologies at farm level to minimise adverse environmental impact. Despite the inclusion of green growth and sustainability concerns under the Food Harvest strategy, an environmental assessment of the likely impacts of its proposed targets revealed a projected increase of emissions (Farrelly et al. 2014). On the one hand, this will be driven by methane emissions from livestock because Food Harvest aims for an increase in dairy cow numbers of 14% between 2015 and 2020 (Department of Agriculture, Food and the Marine, n.d.c). On the other hand, this will be caused by emissions from fertiliser application. Food Harvest 2020 projects an increase in fertiliser nitrogen use of 27% by 2020 (Ibid.). At the same time, it is found that agricultural GHG emissions could be reduced by 1.1 Mt or about 5% if a range of measures is taken up (Schulte and Donnellan 2012, as cited in Department of Agriculture, Food and the Marine, n.d.c, p.7). Estimates of the technical abatement potential achievable by 2030 have yet to be produced (Department of Agriculture, Food and the Marine, n.d.c).

The preparation of the new Rural Development Programme (RDP) for the period 2014-2020 is also being informed by the findings and recommendations of the Roadmap, and will support the Smart Green Growth message of Food Harvest 2020 and thus will encompass the themes of technology, efficiency and sustainability (Anon., 2014). The draft RDP submitted to the Commission in July 2014 has enhanced capital investment measures for environmental facilities, bioenergy, etc. and has a very specific focus on knowledge transfer mechanisms which improve competitiveness and have positive climate change effects. It has yet to be approved by the Commission. The RDP, i.e., introduces a new agri-environment/climate scheme (GLAS), which will build on the progress made under the Rural Environment Protection Scheme (REPS)⁵ and similar projects encouraging sustainable farming. This will provide for a maximum payment of €5,000 for up to 50,000 farmers, and a further payment of up to €2,000 for a limited number of farmers who take on particularly challenging actions. Farms under the REPS scheme were found to use less chemical nitrogen than on non-REPS farms (76.3 kg/ha compared to 85.9kg/ha) (2012 National Farm Survey as cited in DAFM 2014, p.7), so the GLAS scheme can be expected to have positive impact on emission reductions.

DAFM is also funding several projects involving renewable energy, such as biomass boilers, combined heat and power (CHP) systems etc. under the National Horticultural Grant Scheme and the EU Producer Organisation Scheme (Ibid.). Teagasc (the Agriculture and Food Development Authority in Ireland.), as part of its Green Policy, is also investing in a number of demonstration projects on biomass-based renewable energy such as an anaerobic digestion plant which should be completed by 2015 (Ibid.). In sum, policy efforts are underway to shift the Irish agricultural sector away from its projected high emissions pathway, but their impact will need to be assessed in due course.

5 Policy progress against Country Specific Recommendations (CSRs) issued 2013

The EU Commission provides Country Specific Recommendations (CSRs) for each MS for consideration and endorsement by the European Council. The recommendations are designed to address the major challenges in relation to the targets of the EU 2020 Strategy. In the following table, the CSRs relevant for climate change and energy are listed, and their progress towards their implementation is assessed.

⁵ REPS rewards farmers for carrying out farming activities in an environmentally friendly manner and to bring about environmental improvement on existing farms

Table 4 Country Specific Recommendations of 2014

Existing CSRs	Progress
There is scope to improve the effectiveness of environmental tax instruments and removing environmentally harmful subsidies (EHS).	Ireland applies reduced VAT rates to electricity and offers subsidies to electricity generated from peat. No evidence was found that Ireland was actively trying to revise its environmental tax system or remove EHS in 2014.

References

- ACEA (European Automobile Manufacturer's Association) (2014). Taxation Guide. Available at: http://www.acea.be/uploads/publications/CO_2_Tax_overview_2014.pdf.
- Anon., 2014. *National Reform Programme Ireland*, Available at: http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_ireland_en.pdf: European Commission.
- Anon., n.d. It's official: The Government has cancelled its Midlands wind energy export plan. *The Journal*. [online] 13 April. Available at: [http://www.thejournal.ie/wind-export-plan-1412546-Apr2014/Commission for Energy Regulation & Utility Regulator, 2014. 2013 All-Island Fuel Mix Disclosure, file:///C:/Users/30267/Downloads/SEM-14-058%20SEM%20Fuel%20Mix%20Disclosure%202013%20-%20Information%20Document.pdf:s.n](http://www.thejournal.ie/wind-export-plan-1412546-Apr2014/Commission%20for%20Energy%20Regulation%20&%20Utility%20Regulator,%202014.%202013%20All-Island%20Fuel%20Mix%20Disclosure,%20file:///C:/Users/30267/Downloads/SEM-14-058%20SEM%20Fuel%20Mix%20Disclosure%202013%20-%20Information%20Document.pdf:s.n).
- CE Delft, 2012. An inventory of measures for internalizing external costs in transport. Final Report. November 2012. Online available at: www.cedelft.eu/publicatie/an_inventory_of_measures_for_internalising_external_costs_in_transport/1334
- Customs, I. T. a., 2014. *Air travel tax*. [Online] Available at: <http://www.revenue.ie/en/tax/excise/leaflets/air-travel-tax.html> [Accessed 12 01 2014].
- Department of Agriculture, Food and the Marine, n.d. CAP 2015: An Introduction to Direct Payments. Available at: [Accessed 15 01 2015]. <http://www.agriculture.gov.ie/media/migration/publications/2014/CAP2015AnIntroductiontoDirectPayments260314.pdf>
- Department of Agriculture, Food and the Marine, n.d.b. *2025 Agri-Food Strategy*. [Online] Available at: <http://www.agriculture.gov.ie/2025strategy/> [Accessed 15 01 2015].
- Department of Agriculture, Food and the Marine, n.d.c *Climate Change and Sustainability Background Paper*. Available as word document at: <https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCMQFjAA&url=http%3A%2F%2Fwww.agriculture.gov.ie%2Fmedia%2Fmigration%2Fagri-foodindustry%2F2025agri-foodstrategy%2FClimateChangeSustainabilitybackgroundpaper.doc&ei=PQO5VKiTAYqjyASAqoH4CA&usg=AFQjCNHyjli1cX11Ue3bo6M6fws0-qaNig&sig2=OEI96A6xtPTA3VYKALwHTg&bvm=bv.83829542,d.aWw>
- Department of Agriculture, Food and the Marine, 2014. *Food Harvest2020: Milestones for Success 2014*. Available at: <http://www.agriculture.gov.ie/media/migration/agri-foodindustry/foodharvest2020/Milestones201415ArtFINALLayout1170914.pdf> [Accessed 15 01 2015].
- Department for Communications, Energy and Natural Resources., 2014a. *Bioenergy Plan agreed by Government*. [Online] Available at: <http://www.dcenr.gov.ie/Press+Releases/2014/Bioenergy+Plan+agreed+by+Government.htm> [Accessed 12 01 2015].
- Department for Communications, Energy and Natural Resources., 2014b. *National Energy Efficiency Action Plan 2014*, s.l.: <http://www.dcenr.gov.ie/NR/rdonlyres/20F27340-A720-492C-8340-6E3E4B7DE85D/0/DCENRNEEAP2014publishedversion.pdf>.
- Department for Communications, Energy and Natural Resources., n.d. *Accelerated Capital Allowance*. [Online] Available at: <http://www.dcenr.gov.ie/Energy/Energy+Efficiency+and+Affordability+Division/ACA+Scheme.htm> [Accessed 12 01 2015].
- Department of Communications, E. a. N. R. & Sustainable Energy Authority of Ireland, 2014. *Review and Cost Benefit Analysis of the Accelerated Capital Allowances scheme for Energy Efficient Equipment. For the Department of Finance. October 2014*,

<http://www.dcenr.gov.ie/NR/rdonlyres/4F395ABB-3516-4C1B-B202-8F9A5EA8515C/0/ACACBAFinal.pdf>: Department of Communications, Energy and Natural Resources.

Department for Communications, Energy and Natural Resources., 2014c. *Minister today launches Offshore Renewable Energy Development Plan*. [Online]
Available at: <http://www.dcenr.gov.ie/NR/rdonlyres/22AAAC06-739C-4D5C-B717-432DF763F6E8/0/20140207LaunchofOREDPPressrelease.pdf>
[Accessed 11 01 2015].

Department for Communications, Energy and Natural Resources., 2014d. *Offshore Renewable Energy Development Plan. A Framework for the Sustainable Development of Ireland's Offshore Renewable Energy Resource*. [Online]
Available at: <http://www.dcenr.gov.ie/NR/rdonlyres/836DD5D9-7152-4D76-9DA0-81090633F0E0/0/20140204DCENROffshoreRenewableEnergyDevelopmentPlan.pdf>
[Accessed 11 01 2015].

Department for Communications, Energy and Natural Resources., 2014e. *Midlands Energy Export Project will not go ahead*. [Online] Available at:
<http://www.dcenr.gov.ie/Press+Releases/2014/%E2%80%9CMidlands+Energy+Export+Project+will+not+go+ahead%E2%80%9D+-+Rabbitte.htm> [Accessed 11 01 2015].

Department for Communications, Energy and Natural Resources, 2014f. *Better Buildings: A National Renovation Strategy for Ireland*. Available at:
http://ec.europa.eu/energy/efficiency/eed/doc/article4/2014_article4_en_ireland.pdf [Accessed 15 01 2015].

Dineen, D., Howley, M. & Holland, M., 2014. *Energy in Transport*, s.l.: Sustainable Energy Authority of Ireland.

European Union Energy Efficiency Obligation Scheme. Regulations 2014 (n.d.) (S.I. No. 131 of 2014).

EEA, 2013. *Trends and projections in Europe 2013: Tracking progress towards Europe's climate and energy targets until 2020*. Available at:
[file:///C:/Users/30267/Downloads/FULL%20REPORT%20Trends%20and%20projections%202013%20\(3\).pdf](file:///C:/Users/30267/Downloads/FULL%20REPORT%20Trends%20and%20projections%202013%20(3).pdf) [Accessed 12 01 2015].

EEA, 2014a. *Climate and energy profiles 2014*. Available at:
<http://www.eea.europa.eu/themes/climate/ghg-country-profiles>

EEA, 2014b. *Road fuel excise duties*. Available at: http://www.eea.europa.eu/data-and-maps/daviz/road-fuel-excise-duties#tab-chart_1.

EEA 2014c. *Approximated EU GHG inventory: Proxy GHG emission estimates for 2013*. EEA Technical report No 16/2014. 30 September 2014.

Environment, Community and Local Government, 2014. *Climate Action and Low-Carbon Development Bill 2014. Regulatory Impact Assessment*. [Online]
Available at: <http://environ.ie/en/Environment/Atmosphere/ClimateChange/NationalClimatePolicy/>
[Accessed 12 01 2015].

Environmental Protection Agency, 2014. *Ireland's Greenhouse Gas Emission Projections: 2013 - 2020*. 28 May 2014. Available at:
https://www.epa.ie/pubs/reports/air/airemissions/GHG_report2014.pdf [Accessed 14 01 2015].

Eurostat, SHARES 2014. Short Assessment of Renewable Energy Sources.

Eurostat, ten00065. Total environmental tax revenues as a share of GDP.

Eurostat, tsdcc360. Implicit tax rate on energy.

Eurostat, tsdec360. Energy intensity of the economy.

Eurostat, tsdpc320. Final energy consumption by sector.

Eurostat, tsdtr450. Average carbon dioxide emissions per km from new passenger cars.

Eurostat, tsdcc210. Greenhouse gas emissions by sector.

Farrelly, P., Crosse, S., O'Donoghue, P., Whyte, S., Farrelly, P.B., Burns, T., Byrne, D., Holmes, O., Maklin, R., McKearney, J.J. and F. Salley, 2014. *Environmental Analysis of Scenarios Related to*

- the Implementation of Recommendations in Food Harvest 2020*. The Department of Agriculture, Food and the Marine:
<http://www.agriculture.gov.ie/media/migration/ruralenvironment/climatechange/FoodHarvest2020EnvironmentalAnalysisFINAL050214.pdf>
- Holland, M. & Howley, M., 2014. *Combined Heat and Power in Ireland. 2014 Update.*,
http://www.seai.ie/Publications/Statistics_Publications/CHP-in-Ireland/CHP-in-Ireland-2014-Report.pdf: Sustainable Energy Authority of Ireland.
- Howley, M., Holland, M. & Dineen, D., 2014. *Energy in Ireland 1990 - 2013. 2014 Report*,
http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy-in-Ireland-1990-2013-report.pdf: Sustainable Energy Authority of Ireland (SEAI).
- Irish Green Building Council. 2014. *Scoping Report on Low-Carbon Road Mapping for the Built Environment Sector*. Available
at:http://www.igbc.ie/c5/files/1014/0126/8316/IGBC_Low_Carbon_Roadmap_28.05.14.pdf
- Minister for the Environment, Community and Local Government, n.d. *National Climate Policy Position*. Available at:
<http://www.environ.ie/en/Publications/Environment/Atmosphere/FileDownload,37827,en.pdf>
[Accessed 14 01 2015].
- Press Office, D. o. C. E. a. N. R., 2014. *Launch of €70 million Irish Energy Efficiency Fund*. [Online] Available at:
<http://www.dcenr.gov.ie/Press+Releases/2014/Launch+of+%E2%82%AC70+million+Irish+Energy+Efficiency+Fund.htm>
[Accessed 12 01 2015].
- Scheer, J., Stanley S. and Clancy M. 2014. *Ireland's Sustainable Energy Supply Chain Opportunity*. Sustainable Energy Authority of Ireland, IDA Ireland and Enterprise Ireland:
http://www.seai.ie/Publications/Statistics_Publications/Energy_Modelling_Group_Publications/Ireland%E2%80%99s-Sustainable-Energy-Supply-Chain-Opportunity.pdf
- Service, I. G. N., 2014. [Online] Available at: http://www.merrionstreet.ie/en/News-Room/Releases/Statement_on_Budget_2015_Department_of_Communications_Energy_and_Natural_Resources.html
[Accessed 12 01 2015].
- Shankleman, Jessica. 2014. Ireland-UK wind plans shelved. *Business Green*, [online] 15 April. Available at: <http://www.businessgreen.com/bg/analysis/2339719/ireland-uk-wind-farm-export-plans-shelved>
- Siemens, 2014. *An Enterprising Wind. An economic analysis of the job creation potential of the wind sector in ireland*, s.l.: Irish Wind Energy Association. Sustainable Energy Authority of Ireland, 2014. *Electric Vehicle Grant Scheme*. Available at:
http://www.seai.ie/Grants/Electric_Vehicle_Grant_Scheme/#sthash.rTUkroKU.dpuf
- Withana, S. et al., 2014. *Environmental tax reform in Europe: Opportunities for the future, A report by the Institute for European Environmental Policy (IEEP) for the Netherlands Ministry of Infrastructure and the Environment. Final Report.*, Brussels: IEEP.