

Ireland's second National Energy Efficiency Action Plan to 2020



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Foreword

The Minister for Communications, Energy and Natural Resources, Pat Rabbitte TD



Energy efficiency makes our economy more competitive, while lowering our greenhouse gas (GHG) emissions and maximising our economic competitiveness. Energy efficiency is the foundation of a sustainable

economy and internationally accepted as one of the central pillars of energy policy. The economy-wide benefits of investments in energy efficiency improvement measures greatly outweigh the upfront costs.

The new Energy Efficiency Directive sets out the policy roadmap for the period to 2020. It is in all our interests to implement it swiftly and deliver it successfully. We can be under no illusions about the challenges that we face in meeting our efficiency targets, not least of which is the finance necessary to underwrite the scale of retrofit required in our building stock. It will only be through sustained commitment by both the public and private sectors that we will realise the investments necessary to make our homes and public buildings warmer and more efficient. It is imperative that we quickly implement the new obligations in our national law so we can all reap the benefits of sustainable employment, growth and future investment.

Ireland has witnessed a great many changes in recent years, with many in society facing considerable financial difficulties due to the economic downturn. Rising energy bills and cold winters exacerbate the problem, forcing households to spend more than they can afford in order to keep the lights on and the house warm. Energy efficiency is the best solution to reducing society's exposure to energy bills. By taking steps to reduce consumption, households and businesses can save money while improving comfort, and also productivity in the case of business.

The global context of high energy prices, turbulence in world oil markets and over-dependence on fossil fuels set against the critical role of energy in our economy and impact on competitiveness makes energy efficiency an obvious policy imperative.

This second National Energy Efficiency Action Plan builds on the foundations laid by the first plan in that it reaffirms the 20% energy-saving target in 2020. Each of the 90 actions contained in the first Action Plan has been reviewed. Where appropriate, we have updated, amended or even deleted them. This is expected and necessary in any strategy covering a multiannual period.

Fundamental to this process is the creation of a vision for the intelligent delivery of energy services, around which public and private-sector actors can mobilise to deliver energy efficiencies to all parts of the economy. Strong commitment from all sectors of the economy, underpinned by Government support, will be required to realise the vast benefits available from improved energy efficiency.

The Better Energy Programme, launched in May 2011, will play a central role in meeting the national and European targets. It is designed to maximise the return from public and private investment in energy efficiency, while taking account of the need to protect vulnerable households from energy poverty.

Energy efficiency gains achieved to the end of 2010 account for over 26% of the 2020 target. Should all measures detailed in this plan reach their full potential by 2020, we project that annual energy savings of over 34,000 GWh will have been achieved. However, this will require sustained effort from both Government and the private sector.

Every 1 GWh reduction in primary energy use through improved energy efficiency translates into approximately €70,000 of savings to households and businesses. Given that around 86% of our primary

energy is imported (2010), much of this money leaves the Irish economy – which provides a further imperative to act. There are also wider societal costs if we do not meet our already committed national targets. These include higher energy costs to consumers, greater exposure to external energy price shocks, loss of competitiveness, problems associated with poor dwellings and potential fines for not meeting EU CO₂ targets.

On the other hand the benefits of implementation include the value of the energy savings to the public and private sectors, increased business competitiveness, health improvements via warmer homes and buildings and a significant contribution to EU emission targets.

December 2012

Executive Summary

Energy policy has a pivotal role to play in creating the conditions for a return to economic growth and job creation. The wellbeing of both our economy and society depends on safe, secure, sustainable and affordable energy. Our energy policy remains firmly set in the European and global context. Ireland's security of energy supply also critically depends on the EU's strategies to ensure that Europe's energy needs are met and are secure at all times.

Ireland has fully endorsed the objectives of Europe's Energy 2020 – A strategy for competitive, sustainable and secure energy. These policies are embedded in the Energy Policy Framework 2007-2020 – Delivering a Sustainable Energy Future for Ireland and will guide Irish policy into the future. As a peripheral island energy market, Ireland can benefit from a fundamental transformation of Europe's economy to a low-carbon economy based on radically increased energy efficiency, accelerated deployment of renewable energy, smart networks and a well-functioning, well-interconnected internal energy market.

In the public sector, the most significant cost-cutting and energy-saving potential lies in improving the energy performance of buildings and facilities. This will be a key focus of Better Energy, which will seek to raise financing from institutional investors for retrofit work in the public sector.

Realisation of the public sector's 33% target would lead to annual energy savings to the Exchequer of over €200 million (€2011). The net present value of these upgrades is estimated at over €1.4 billion. This is before the value of impacts such as increased productivity, asset value increases and improved building environments are considered.

Extent of the challenge

Ireland's total final consumption in 2010 was 12 Mtoe, a decrease of 0.9% on 2009 but 66% above 1990 levels (representing growth of 2.6% per annum on average). This decrease in final consumption in 2010 compares with a 0.3% decrease in primary energy, indicating a small decrease in efficiency of supply. Final consumption peaked in 2008 and has fallen by 9.6% since.

The impact of energy efficiency measures is being seen across all sections of society in Ireland and particularly the residential sector. Household efficiency improvements are leading to financial savings and increased warmth and health; business savings are increasing competitiveness, and the public sector is cutting its energy bills across all Departments, demonstrating the significant potential available to broader private markets. Ongoing improvement in the efficiency of the transport fleet is being delivered through technology improvements. However, much remains to be done to exploit the full potential of energy efficiency in Ireland and across the EU.

Energy savings reduce GHG emissions and contribute to our climate-change objectives. Reducing energy demand and consumption also works towards achieving our EU renewable energy targets, since these are calculated on the basis of a percentage of our demand.¹

¹ Renewable energy delivered 14.8% of electricity demand in 2010, surpassing our 2010 RES-E Directive target of 13.2%. In addition, the capacity to deliver renewable electricity has continued to grow by an average of more than 150 MW per year, reaching 1,585 MW by September 2011.

A roadmap to energy savings

The first National Energy Efficiency Action Plan (NEEAP, 2009) set out to deliver a 20% national energy savings target (equivalent to 31,925 GWh) for the whole economy through energy efficiency by

2020. Savings achieved to the end of 2010 account for 26% (over 8,300 GWh) of the national target, representing a reduction in energy spend of almost €480 million per annum. The energy savings are distributed as follows:

Sector	Energy savings (GWh)			CO ₂ (kt CO ₂)		
	2010	2016	2020	2010	2016	2020
Public Sector	650	1,975	3,240	155	455	730
Business	2,505	4,340	5,820	620	1,025	1,330
Buildings	2,565	9,565	15,255	625	2,295	3,650
Mobility-Transport	630	3,295	5,330	160	840	1,360
Energy Supply	1,965	2,000	4,415	490	365	595
Total	8,315	21,175	34,060	2,050	4,980	7,665

An estimated reduction in CO₂ emissions of over two million tonnes has also been achieved. Should all measures detailed in this plan reach their full potential by 2020, it is anticipated that a reduction in annual emissions of around 7.7 Mt will be achieved. This represents a potential reduction in energy spend across all sectors of approximately €2.4 billion (€2011).

Energy policy has shifted substantially in the years since the publication of the 2009 NEEAP. The year 2020 is rapidly approaching, and we are looking beyond that landmark date towards the longer-term impacts of today's energy policies. Many of the new policies outlined in this second NEEAP seek to embed energy efficiency into the public consciousness, moving away from simple marketing tools and towards a collective understanding of what energy efficiency means for security of supply, competitiveness and sustainability.

Key Action Plan measures

This Action Plan contains 97 actions, measures and programmes. Each will play its part in securing a more sustainable energy future for Ireland. Of the 97 actions, the following five will play an integral role in the delivery of the national target:

- 1. Public sector:** We will introduce a series of obligations on public-sector bodies to address consumption, procurement and reporting of energy use.
- 2. Energy Performance Contracting:** We will establish a national Energy Performance Contracting (EPC) process to deliver innovative models of retrofitting and financing of energy efficiency measures in the commercial and public sectors.

- 3. PAYS:** We will introduce an appropriate Pay-As-You-Save (PAYS) model for Ireland to replace existing Exchequer supports for domestic and non-domestic energy efficiency upgrade measures.
- 4. Energy-saving targets for energy suppliers:** The Better Energy programme will deliver energy efficiency savings across a number of sectors.
- 5. Implementation Group:** A Cross-Departmental Implementation Group will be established to ensure that all the actions contained in this Action Plan are delivered.

Public Sector

In order to demonstrate the leading role of the public sector in driving delivery of energy efficiency improvements, and to demonstrate the benefits available, a specific 33% savings target is being pursued in the public sector for 2020 – equivalent to 3,240 GWh. Savings achieved in the public sector to the end of 2010 represent 20% of the target. New measures have recently been launched with a specific focus on the public sector to pursue this target. The Public Sector Programme which supports strategic energy management will provide further demonstration of the benefits of energy efficiency improvements to the whole economy.

The public sector sends an important leadership signal. By demonstrating its commitment to excellent energy performance, the sector can provide confidence to others in the market that there is an exciting and profitable future for technologies and services that emphasise energy efficiency. Although the public sector consists of a diverse set of institutions and activities, with equally diverse patterns of energy use, effective energy management is the common goal in order to

make valuable energy savings in the short term, to sustain those savings over time and to achieve the ambitious 2020 target.

Energy Performance Contracting (EPC)

The EPC framework will provide an integrated resource to public and commercial organisations that want to implement energy-saving retrofit projects using EPC or non-Exchequer financing. Among the key deliverables are the development of standard documentation and model contracts. The objective will be to build capacity among organisations for which EPC is their preferred method of procuring and implementing energy-saving projects.

Pay-As-You-Save

The Programme for Government commits to the rollout of a Pay-As-You-Save (PAYS) scheme after 2013 to enable the home energy efficiency programme to continue without recourse to public funding. PAYS is a financial model that would allow energy consumers to finance energy efficiency upgrades through the energy savings generated. The Department is working with other government departments, the Sustainable Energy Authority of Ireland (SEAI) and the utilities and financial institutions to develop proposals for the introduction of a national PAYS scheme in line with this timeframe.

Energy Saving Targets for Energy Suppliers

The realisation of the ambition of the Better Energy programme is the next big challenge for energy efficiency in Ireland. This programme encompasses

a broad range of initiatives, and aims to deliver energy efficiency savings across a number of sectors.

The residential sector has long been a focus of energy efficiency policy, and Better Energy will be key to realising a sustainable model for upgrades. Under Better Energy, domestic customers will be able to apply for state-supported incentives, through their energy supplier or other provider. Voluntary agreements are already in place with a number of the largest energy suppliers, confirming their commitment to making energy efficiency more affordable for their customers.

A three-year energy savings target of 2,000 GWh was set for 2011-2013, to be achieved by a combination of energy supplier-led initiatives and SEAI programme activity. The target for 2011 was 500 GWh, which was met (576 GWh delivered). The annual targets for 2012 and 2013 are 750 GWh.

Implementation Group

This Action Plan will be closely monitored on an ongoing basis by a Cross-Departmental Implementation Group that will report to Government at regular intervals on progress being made towards our 20% target. As actions are implemented, new measures and savings will be identified, and this Action Plan will be revised accordingly. We will publish an updated Action Plan in 2014, in accordance with European Commission requirements.

Key Sectoral Measures

The following are the principal measures contained in this Action Plan, and represent the key targets for Government to achieve our 2020 commitments. (The numbering reflects that in the relevant sections later in the Action Plan.)

Public Sector

11. We will introduce obligations on all public bodies to develop and implement energy management programmes appropriate for their organisations.
17. We will introduce an obligation on public bodies that are contracting the development of capital projects with projected energy consumption in excess of 1 GWh per annum to formally integrate the principles of energy-efficient design into the project development phase. Public bodies must adhere to the overall appraisal principles and requirements of the new Public Spending Code in the first instance.
23. We will develop an energy monitoring and reporting system to satisfy the reporting requirements of both S.I. 542 of 2009 and the NEEAP, and to facilitate public bodies in reporting on energy efficiency in their annual reports.

Energy Supply

29. We will prioritise energy efficiency in investment decisions for new-generation plant.
35. We will work collaboratively to maximise the full potential of Smart Grid deployment in Ireland.
30. We will continue to investigate the scope for reducing energy transmission and operational losses.
32. We will significantly expand our demand-side management initiatives.

Transport

40. We will continue to incentivise the purchase of more energy-efficient vehicles.
46. We will continue to promote mobility management plans in schools and workplaces and at home.
50. We will use spatial planning policies to reduce unnecessary commuting.
51. We have introduced a carbon tax on petrol and diesel, which sends a strong pricing signal to road users.

Business

64. The Better Energy Workplaces scheme will achieve significant, measurable and verifiable energy performance gains in the public and private sectors that will act as exemplars, leading to replication of energy-efficient retrofit measures across these sectors.
66. We will extend the Large Industry Energy Network (LIEN) membership, achieve deeper energy savings and intensify participation in the international energy management standard ISO 50001.
67. We will ensure that the SME sector has access to the necessary supports to reap the financial benefits from investment in appropriate energy management practices.
68. We will develop the Accelerated Capital Allowance (ACA) products list and Triple E register to serve as the recognised reference list for energy-efficient procurement.
69. We will develop the construction industry's capacity to achieve higher energy performance standards and create

sustainable jobs over the lifetime of this Action Plan.

Residential

81. We will target those in energy poverty through the implementation of the Affordable Energy Strategy.
83. We will implement the provisions of the Recast Energy Performance of Buildings Directive (EPBD).
85. We will encourage industry to work towards the building requirements outlined in the framework for achieving low- or nearly zero-energy housing on a voluntary basis from 2013.

Cross-Sectoral

86. We will ensure that the Better Energy Programme will upgrade Ireland's building stock to high standards of energy efficiency, thereby reducing fossil-fuel use, running costs and greenhouse-gas emissions.
88. We will lead an ESCO Action Plan which will target a number of stakeholders including relevant policymakers, market actors, potential Energy Performance Contract customers and financiers.
89. We will introduce an appropriate Pay-As-You-Save (PAYS) model for Ireland to replace existing Exchequer supports for domestic and non-domestic energy efficiency upgrade measures.
95. We will investigate the mechanism by which we could replicate the Energy Efficiency Opportunities Programme into our large-industry supports.

Chapter 01

Introduction

Energy Efficiency First

Improving Ireland's energy efficiency is an essential part of Ireland's energy policy and is designed to steer Ireland to a new and sustainable energy future, one that helps us stimulate economic renewal and reduce energy costs. Our research shows that investing in energy efficiency will, on average, deliver a 5:1 return. We cannot ignore such an economic opportunity. The NEEAP represents our plan of action: how we realise these savings for the benefit of Irish society. If delivered, NEEAP will realise savings of €2.36 billion (€2011) in 2020. Embedding the 'energy efficiency first' principle will help to create and retain employment, lead to multiplier effects in the local economy and stimulate innovation in the green-tech sector. Efficient energy use directly contributes to security of energy supply, sustainable transport, affordable energy, competitiveness and environmental sustainability.

The Government has committed to achieving, by 2020, a 20% reduction in energy demand across the whole of the economy through energy efficiency measures. Recognising that Government must lead by example, we remain committed to achieving a 33% reduction in public-sector energy use. Since the publication of the first action plan, new policy measures have been taken or will soon be launched to strengthen and deepen our energy savings efforts. Moreover, the European Union policy context is evolving with the publication of an Energy 2020 strategy that places even greater emphasis on the role of energy efficiency in achieving our 2020 targets.

Global Energy Efficiency

In its World Energy Outlook 2011, the International Energy Agency (IEA) contained a stark warning that, despite economic uncertainty, the growth in primary energy demand jumped by 5% in 2010 and is predicted to increase by one-third by 2035. One of the key findings is that "there are few signs that the urgently needed change in direction in global energy trends is under way".

The report states that energy is at the heart of the climate challenge, especially when set in the context of a long-term target to limit the global average temperature increase to 2°C. It further argues that given almost 80% of the total energy-related CO₂ emissions permissible by 2035 in order not to exceed this limit are already "locked in" by the existing capital stock; in the context of rising incomes and population over the long term driving further energy demand, it is clear that stringent action is required before the current decade is over.

Efficiency gains can contribute most to EU emissions reductions but a significant ramp-up in effort is urgently required, driven by strong policy action. Higher efficiency standards, a gradual reduction in subsidies for fossil fuels and accelerated implementation will all be required if efficiency improvements are to account for 50% of the cumulative CO₂ abatement required over the period of the IEA's outlook. Simply put, according to the IEA, "the most important contribution to reaching energy security and climate goals comes from the energy that we do not consume". Clearly, any post-2020 targets that may be agreed will be a matter for negotiation at EU level.

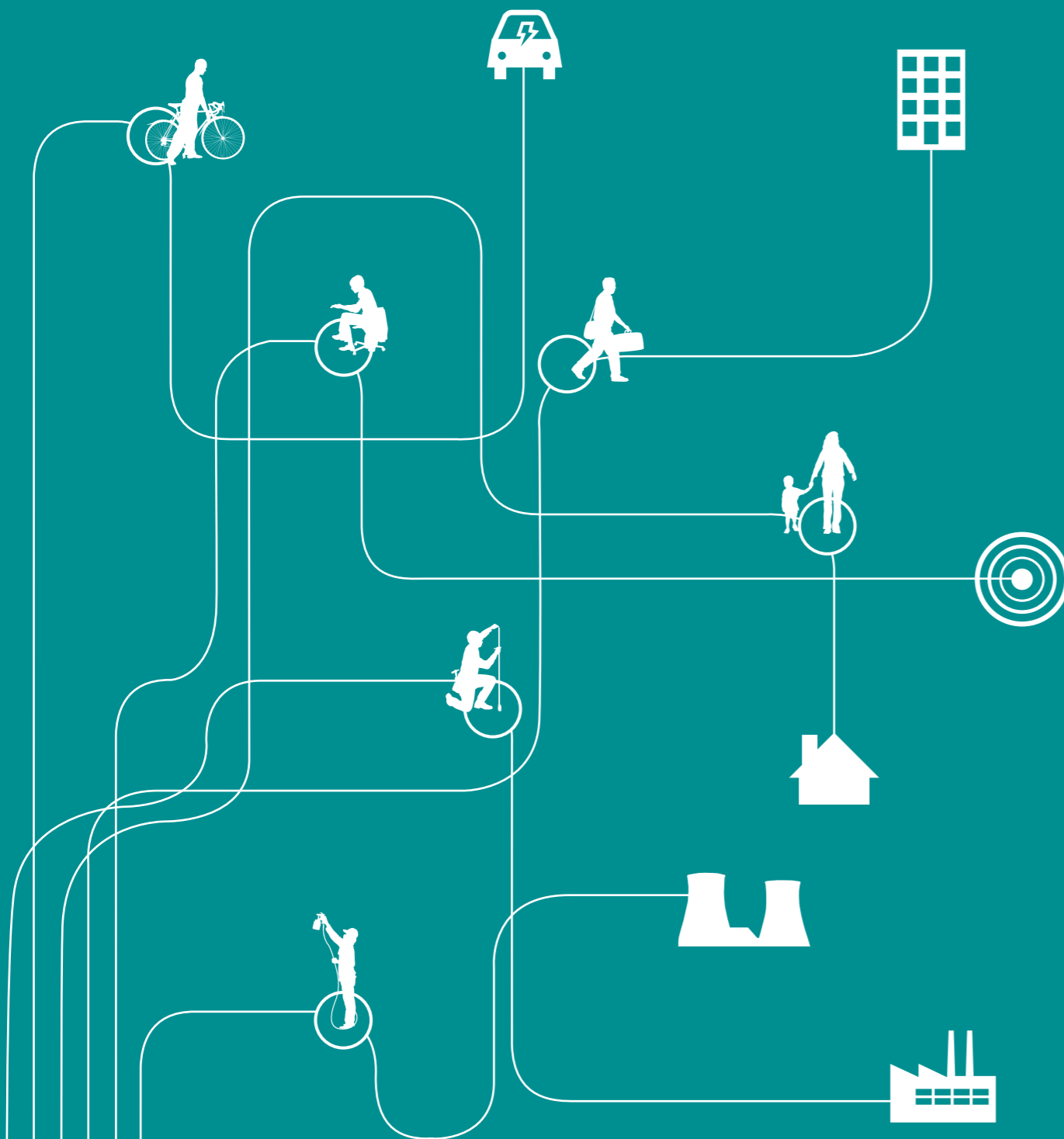
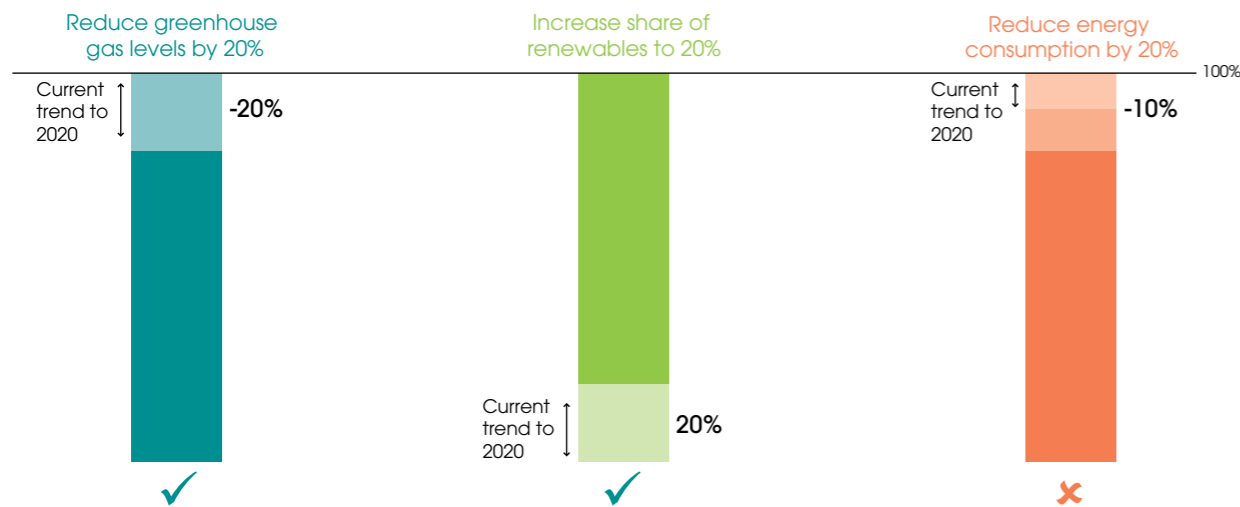


Figure 1: EU Energy Targets

Meeting all three “20-20-20 by 2020” goals becomes a matter of urgency



Source: EU Commission, June 2011

Energy 2020 Strategy²

The European Commission has set out a strategy for competitive, sustainable and secure energy over the next 10 years, which will require energy investments of some €1 trillion. The strategy focuses on investment, the public sector as an exemplar, buildings and transport, and the critical role of national energy efficiency action plans. The context is an acknowledgement that the EU 20% energy efficiency target by 2020 remains challenging in the light of current projections and requires urgent action.

The strategy focuses on five priorities:

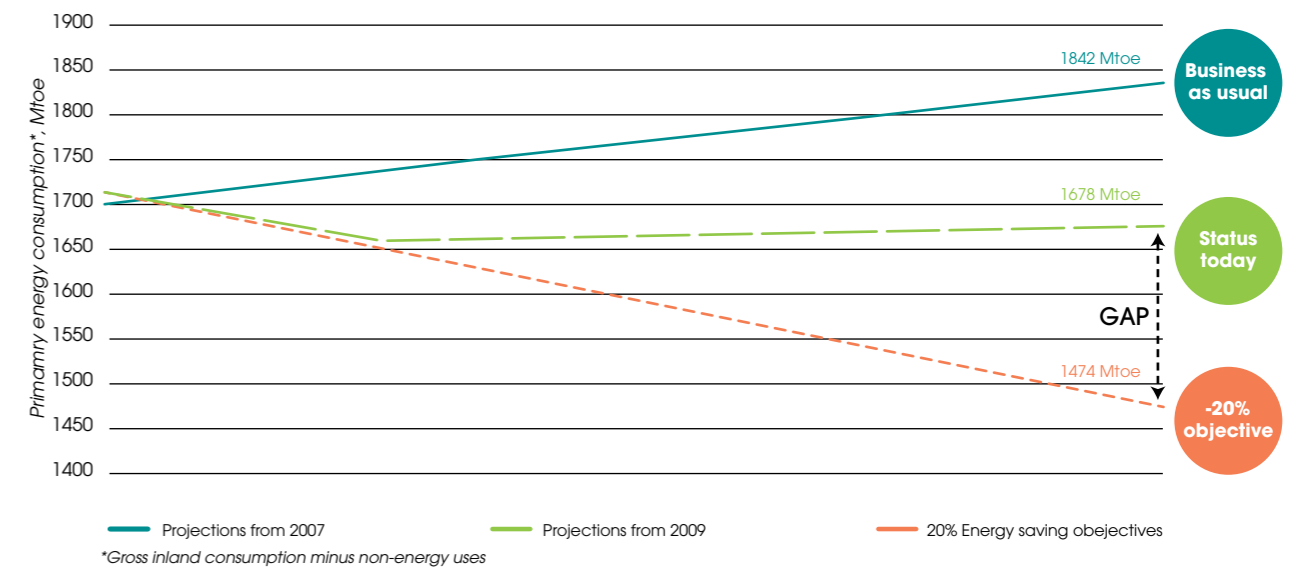
1. Achieving an energy-efficient Europe.
2. Building a truly pan-European integrated energy market.
3. Empowering consumers.
4. Extending Europe's leadership in energy technology and innovation.
5. Strengthening the external dimension of the EU energy market.

It is significant that energy efficiency is the number one priority. The Commission acknowledges that “energy efficiency is the most cost effective way to reduce emissions, improve energy security and competitiveness, make energy consumption more affordable and create employment”.

² Energy 2020 – A strategy for competitive, sustainable and secure energy http://ec.europa.eu/energy/strategies/2010/2020_en.htm

Figure 2: Progress to EU Energy Targets

So far the EU is not on track to meet its 20% energy saving target by 2020



Source: EU Commission, June 2011

Nevertheless, the Commission expresses concern about the efforts to achieve 20% energy savings by 2020. The communication states: “The quality of National Energy Efficiency Action Plans, developed by Member States since 2008, is disappointing, leaving vast potential untapped. The move towards renewable energy use and greater energy efficiency in transport is happening too slowly. While we are broadly on track for the 20% target for renewables, we are a long way from achieving the objective set for energy efficiency”.

The European Council of February 2011 underlined the need to inject impetus to the EU's energy efficiency objectives by calling on the Commission to take “determined action to tap the considerable potential for higher energy savings of buildings, transport and products”.³

³ European Council Conclusions 04/02/2011, EUCO 2/11

European Energy Efficiency Plan⁴

The Commission published the Energy Efficiency Plan (EEP) in March 2011 as a detailed response setting out the major policy actions to be pursued under the Flagship Initiative for a Resource Efficient Europe.⁵ In advance of publishing the EEP, the Commission carried out a detailed mapping exercise on the achievement of the 20% energy efficiency target for 2020, which concluded that, on current estimates, it will not be reached with existing policy measures.

The Commission has again underlined the enormous energy-saving potential in buildings,

⁴ Energy Efficiency Plan 2011 – Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions COM (2011) 109/4, March 2011

⁵ COM (2011) 21

and also the transport sector which is the subject of a separate white paper.⁶ The public sector has a critical role in leading from the front and creating new markets for energy-efficient technologies, services and business models. Industry, too, has a responsibility to promote energy efficiency measures across the whole energy supply chain in order to improve competitiveness and profitability.

EU Legislative Initiatives

The **Energy Services Directive (ESD)**⁷ is the main legislative mechanism through which energy efficiency policy at EU level is delivered. The directive seeks to promote end-use energy efficiency in EU member states through support measures and the removal of institutional, financial and legal barriers. The ESD is set to be largely repealed by the **Energy Efficiency Directive (EED)** adopted by the Council and Parliament in October 2012.

The EED will translate certain ambitious elements of the European Energy Efficiency Plan into binding measures. The proposed legislative provisions set binding measures on member states, including an annual rate of renovation for central government buildings of 3%; an obligation on public bodies to procure products, services and buildings with high energy-efficient performance; obligations on industry relating to energy audits and energy management systems, and a common framework for national energy savings obligation schemes equivalent to annual energy savings of 1.5% of energy sales. The new directive entered into force on 4 December 2012 and must be transposed by 5 June 2014.

⁶ Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system COM (2011) 144, March 2011

⁷ Energy Services Directive 2006/32/EC

Ireland transposed the ESD through the Energy End-Use Efficiency and Energy Services Regulations 2009 (S.I. 542 of 2009) which provided for national energy efficiency saving targets; energy services including the availability of energy audits to final customers; the exemplary role of the public sector, and the promotion of energy efficiency by energy suppliers.

A primary focus of both the ESD and the EED is on domestic and commercial buildings, as these sectors account for 40% of total energy consumption in the EU. The **Directive on Energy Performance in Buildings (EPBD)**, adopted in 2002, primarily affects energy use and efficiency in the building sector in the EU. Ireland transposed the EPBD through the Energy Performance of Buildings Regulations 2006 (S.I. 666 of 2006) which provided for the Building Energy Rating (BER) system to be administered and enforced by the Sustainable Energy Authority of Ireland (SEAI).

The **Recast Energy Performance of Buildings Directive (EPBD)**,⁸ adopted in May 2010, states that reduction of energy consumption and the use of energy from renewable sources in the buildings sector constitute important measures needed to reduce the Union's energy dependency and greenhouse-gas emissions. The directive aims to have the energy performance of buildings calculated on the basis of a cost-optimal methodology. Member states may set minimum requirements for the energy performance of buildings.

The recast EPBD requires Ireland to ensure, among other obligations, that building energy ratings are included in all advertisements for the sale or lease of buildings; that Energy Performance Certificates are displayed in public and privately owned buildings frequently visited by the public; that heating and air-conditioning systems are inspected;

⁸ Directive on the Energy Performance of Buildings (Recast) 2010/31/EU

that consumers are advised on the optimal use of appliances, their operation and replacement, if necessary; that energy performance certificates and inspection reports are of good quality, prepared by suitably qualified persons acting in an independent matter, and are underpinned by a robust regime of verification; and that a national plan is developed to increase the number of low- or nearly zero-energy buildings, with the public sector leading by example. The directive was transposed by the European Union (Energy Performance of Buildings) Regulations 2012 (S.I. 243 of 2012).

The **Ecodesign Directive (2009/125/EC)** was transposed by the EU (Ecodesign for Certain Energy-related Products) Regulations 2011 (S.I. No. 203 of 2011) which extends the scope of an earlier directive (2005/32/EC) to a wider variety of products that can contribute to energy saving.

The **Energy Labelling Directive (2010/30/EU)** was transposed by the EU (Energy Labelling) Regulations 2011 (S.I. No. 366 of 2011), which extend the application of the directive to an increasing range of products which have a direct or indirect impact on energy consumption during use. The regulations oblige suppliers of energy-using products covered by an EU measure to supply an energy label and fiche with the product.

National Policy

Most actions published in the first NEEAP have been significantly progressed over the last three years.

A programme to place energy savings targets on energy suppliers who supply more than 75 GWh of energy per annum has been introduced. Sixteen participating companies have signed voluntary agreements to deliver energy savings between 2011 and 2013. Our objective is to encourage the remaining companies to conclude voluntary

agreements or be subject to a mandatory obligation. The introduction of a carbon tax in Budget 2010 of €15 per tonne on non-Emissions Trading Scheme (ETS) installations, which was increased to €20 in Budget 2012, provides an incentive for energy efficiency in all sectors. Over the last decade the standards for both housing and non-residential buildings have been constantly reviewed and strengthened, leading to a situation where the mandatory minimum energy efficiency requirements for buildings are among the highest in Europe.

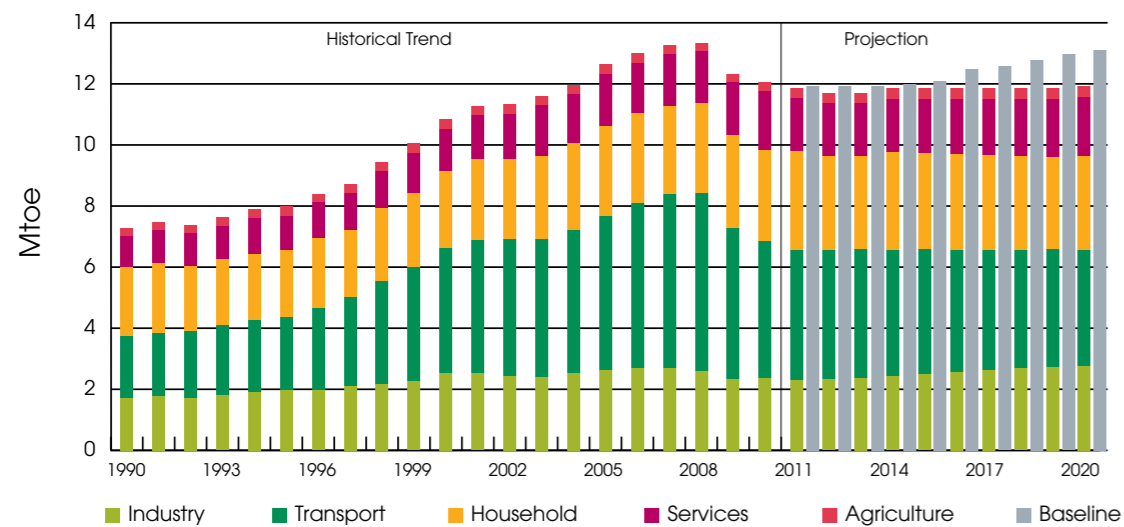
Despite considerable progress, challenges remain. These are most evident in the transport and public sectors, to which this updated strategy will give particular focus. Moreover, the current economic uncertainty may affect our ability to meet certain targets. Clearly, the short-term outlook is challenging but this may also present an opportunity for energy suppliers to launch innovative product offerings to encourage greater take-up based on lifecycle cost savings. All of these efforts will have an impact on national energy reduction targets.

The National Reform Programme (published April 2011) re-commits our ambition to move towards a 20% increase in energy efficiency in line with overall EU 2020 headline targets.

Public Consultation

A national consultation exercise, designed to inform the preparation of the second NEEAP, was completed in 2011; 32 responses were received from a variety of sources, and most of these from the energy sector. As well as submissions from large energy organisations and suppliers, many also came from local energy agencies and regional authorities.

Figure 3: Total final demand by sector (NEEAP/NREAP scenario)



The Action Plan was widely welcomed; many respondents underlined the urgency attaching to realising the full potential of energy efficiency, while acknowledging the difficult challenge of meeting the targets, and the need to monitor progress and prioritise actions according to their cost-effectiveness. There was a strong degree of consensus on a range of topics, including the importance of the Better Energy Programme and Smart Metering Project, and the ongoing need for a more efficient transport sector.

The SEAI's latest energy demand forecast⁹ illustrates the potential impact on 2020 energy demand resulting from savings through achieving the 2020 national 20% energy savings target. Figure 3 above shows the changed trajectory of future energy demand in each sector of the economy compared to a baseline scenario in which no further energy efficiency policies are implemented (beyond

those policies and measures existing at the end of 2010). Future total final demand is influenced both by the energy savings expected and projections for economic growth over the period. Demand is forecast to remain constantly below 2004 levels as a result of the interaction of ongoing energy efficiency improvements, as detailed in this second NEEAP modelled to 2020, and development of the economy over that time.

A broad range of benefits from improved energy efficiency flow from the actions detailed in this plan. These benefits can be categorised under the three pillars of energy policy: competitiveness, security of energy supply and environmental sustainability.

Competitiveness

It is generally accepted that the era of cheap fossil fuels for energy production is over.¹⁰ As energy costs become a more significant part of business and household expenditure, we must reduce the amount of energy used in order to relieve this pressure.

An energy-efficient economy is a more competitive one. Businesses can produce more output per unit of energy and gain market share. Households with more disposable income available after paying energy bills are better able to participate in other markets. The energy savings achieved to end 2010 by the programmes and measures detailed in this plan represent a reduction in energy spend of approximately €470 million per annum. Realisation of the energy savings ambition outlined for 2020 represents approximately €2.4 billion (€2011) in savings to business and households, money that will be available to stimulate the economy in other ways.

Achieving energy efficiency in our businesses and homes can also provide jobs in the construction, engineering, design, ICT and other related sectors. Recognising the job-creation potential of the Green Economy, the Action Plan for Jobs 2012 contains an action to publish and implement a new plan for the development of the Green Economy.¹¹ It should be recognised that energy efficiency improvements form a key part of realising this potential. In particular, we will continue to raise awareness and provide opportunities for companies to reduce energy use through providing advisory services and appropriate supports.

Security of supply

In today's world of volatile energy prices, over-reliance on imported fossil fuels leaves an economy exposed to price spikes similar to those experienced in 2008. More recently we have seen worldwide energy price fluctuations due to political unrest in oil-exporting countries. Ireland is particularly vulnerable to sudden price moves as we rely heavily on imported gas for electricity generation, for some energy-intensive industrial processes and for heating many of our homes and businesses.¹² Our transport sector is also heavily reliant on oil imports. Reducing demand through efficiency lowers our reliance on fossil fuels, and is the cheapest way of reducing this reliance. Diversification of energy supply, including increased penetration of renewable energy sources, will also benefit Ireland in this regard.

Sustainability

Saving energy results in less CO₂ and other greenhouse-gas (GHG) emissions, contributing to our national emission reduction targets. It is well recognised that energy efficiency is one of the most cost-effective options available to society to reduce GHG emissions. *Ireland's Low-Carbon Opportunity*, for example, highlighted the technical abatement potential in Ireland available at a 'negative cost' to society, particularly from energy efficiency improvements.¹³ In light of recent trends in world oil prices, the €120/barrel scenario presented in that report now seems more likely than the previous headline result, estimated at €60 per barrel.

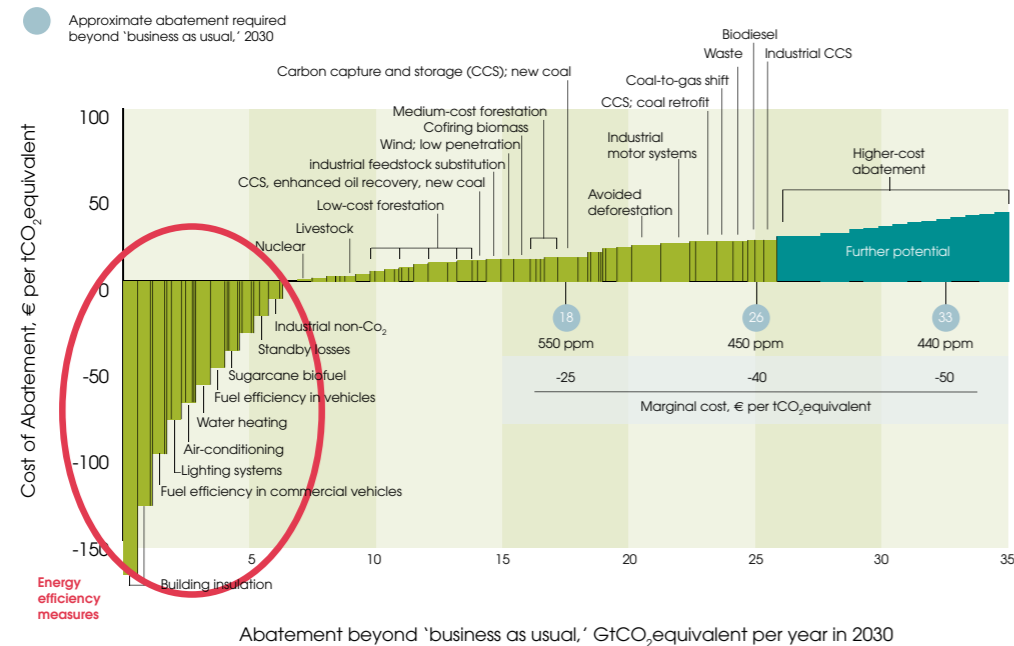
9 Energy Forecasts for Ireland to 2020, SEAI, 2011 report

10 See for example, 'The age of cheap energy is over, IEA Executive Director warns', International Energy Agency (IEA), 21 April 2011.

11 Action Plan for Jobs 2012: <http://www.djei.ie/publications/2012APJ.pdf>

12 Detailed information is provided in 'The Economic Impact for Ireland of High Oil and Gas Prices – Pathways to risk mitigation and a low carbon future'. Report commissioned by Siemens Ltd, July 2010.

13 Ireland's Low-Carbon Opportunity, SEI (now SEAI), 2009

Figure 4: GHG abatement potential and costs

Ireland is a small peripheral energy market on the western edge of Europe, with a dispersed population and grid infrastructure. We are thus heavily dependent on fossil-fuel imports for transport and power generation, which makes us particularly vulnerable to oil price volatility. Nevertheless, there is considerable potential for bioenergy. We have some of the best ocean and wind resources in Europe, which presents an excellent export opportunity in renewable energy. Our experience in developing an all-island electricity market, soon to be followed in the gas market, is unique across the European Union.

The policy imperative is implementing energy demand reduction in the teeth of an economic recession and a very challenging capital investment climate. Allied to this are the uncertainties in world oil markets and the changing global gas market, which maintain the competitiveness pressures on the Irish economy.

Given the longer-term horizon associated with energy policy implementation, the EU responded to the 2050 challenge with the Roadmap for moving to a competitive low-carbon economy in 2050.¹⁴ The roadmap proposes that the energy sector must support a CO₂ reduction of 93% to 99%, thereby becoming almost carbon-neutral. In the subsequent Energy Roadmap 2050 (published in December 2011), the Commission set out the challenges of such an energy transition, while proposing a framework for a long-term strategy for

¹⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0885:FIN:EN:PDF>

sustainable, competitive and secure energy in Europe.

In such a challenging global climate, the priorities remain to (a) secure competitively priced energy supply for business and consumers, creating the necessary conditions for a sustainable energy mix, and (b) roll out a cost-efficient smart energy infrastructure, supported by a stable energy investment framework, to attain an energy-efficient economy.

The SEAI has published a number of roadmaps that consider the period up to 2050. These include an assessment of the scale of the challenge, opportunities and policy options for ongoing development towards a sustainable energy system for Ireland. A series of six roadmaps has been developed, with those relevant to energy efficiency including electric vehicles, the residential sector and smart grids.¹⁵

In the medium term, the Commission published the *Flagship Initiative for a Resource-Efficient Europe*.¹⁶ Member states are required to prioritise energy efficiency as part of the Europe 2020 Strategy, given that the Union's 20% energy efficiency target is one of five headline goals. It also flags the Commission's intention to push for mandatory energy-saving targets in 2014 should member states fail to be on track for realising the 2020 energy-saving target. The emphasis in the European context is on promoting the benefits of energy efficiency for economic recovery, restoring competitiveness and creating business opportunities.

The Energy Efficiency Directive (2012/27/EU), repealing Directives 2004/8/EC (Cogeneration) and

2006/32/EC (Energy Services), has wide implications for Ireland. The new legislation places energy efficiency at the core of the EU 2020 energy strategy and requires member states to further decouple their energy use from economic growth.

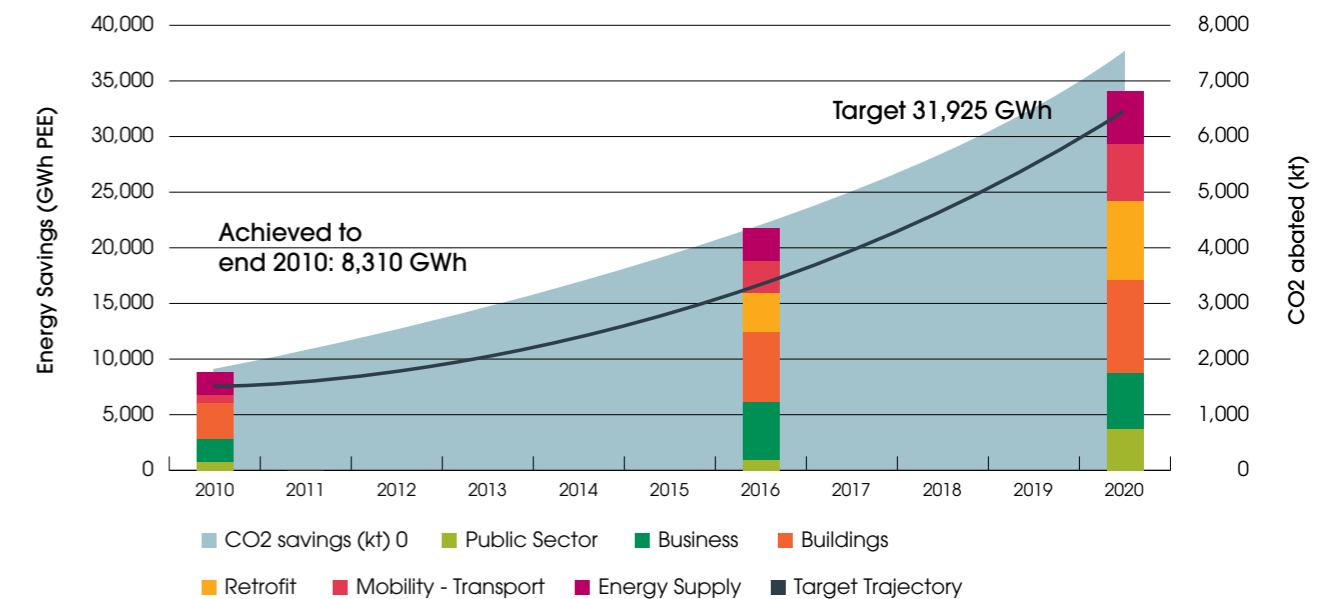
¹⁵ Available at http://www.seai.ie/Publications/Statistics_Publications/Energy_Modelling_Group/

¹⁶ <http://ec.europa.eu/resource-efficient-europe/pdf/>

Chapter 02

Energy Savings Targets – Progress and Future Ambition

Figure 5: Energy and CO₂ savings and target trajectory to our national 20% energy savings target for 2020



The Commission and member states have agreed a robust and ambitious energy efficiency framework that will keep us on track for our 2020 targets, and support employment and sustainable growth.

National Targets

The Government set out in the first National Energy Efficiency Action Plan (NEEAP) how Ireland would meet a 20% national energy savings target (equivalent to 31,925 GWh) by 2020.¹⁷ The 20% reflects a wider EU ambition as part of the package of climate-change measures, often referred to as the 20:20:20 targets, which includes the intention to reduce by 20% primary energy consumption across the EU by 2020. As part of this process, and in accordance with the EU Energy Service Directive (ESD), member states have signed up to achieve an indicative 9% energy-saving target, or 1% per

year to 2016 in the non-ETS sectors. Ireland's 20% target incorporates this objective, and sets a more ambitious level of energy savings, expanding their scope to include both supply and demand-side efficiency gains.

These three targets¹⁸ cover the following areas:

- A 9% savings target for 2016 associated with the Energy Services Directive (ESD), applicable to non-Emissions Trading Scheme (non-ETS) sectors only
- A 20% national savings target for 2020 as set in the Government's 2007 Energy White Paper

¹⁸ All targets are set on the basis of a percentage reduction of average historic energy demand over the period 2001 – 2005 for the relevant sectors. Energy demand in the public sector is calculated as a residual in Ireland's energy balance, as produced by the SEAI (EPSSU) annually. Detail of ongoing work to improve the accounting procedure for energy demand for the public sector is provided in Chapter 3 of this report.

¹⁷ Both the non-ETS and ETS sectors

2007, *Delivering a Sustainable Energy Future for Ireland*, applicable to the whole economy – i.e. both non-ETS and ETS sectors

- A 33% savings target specifically for the public sector for 2020

Progress to Date

ESD 9% by 2016 target

The indicative ESD target is calculated in accordance with the methodology outlined in Annex 1 of Directive 2006/32/EC as 13,117 GWh.¹⁹ Statutory Instrument 542 of 2009,²⁰ which transposes the ESD, sets an interim (2010) indicative target of 5,000 GWh. Estimated savings achieved to the end of 2010 amount to 4,815 GWh, representing a significant achievement, but fall just short of the target. These savings have been achieved across a broad range of energy users in the public, commercial, household, transport and agriculture sectors. Large emitters of greenhouse gases covered by the ETS²¹ and aviation and marine bunker fuels are excluded. Projected savings to 2016 from measures detailed in this Action Plan are expected to exceed the 2016 ESD target (17,130 GWh).

National 20% target

Energy efficiency gains achieved to the end of 2010 account for over 26% (8,310 GWh) of the 2020 target. This level of savings represents a reduction in energy spend of approximately €470 million per annum. Estimated reductions in CO₂ emissions of two million tonnes have also been achieved. Should all measures detailed in this Action Plan reach their full potential by 2020, it is estimated that energy savings totalling over 34,060 GWh per annum will have been achieved, leading to a reduction in annual emissions of over 7.7 Mt CO₂. This represents a potential reduction in energy spend across all sectors of approximately €2.4 billion (€2011) as a result of the savings.

Most of the savings to date have been achieved in the buildings sector through both improved Building Regulations and residential retro-fit schemes. Large industry has contributed a large portion of the business sector savings through deployment of sustainable energy management systems and efficiency improvements by means of increased use of co-generation and renewable heating sources. Retrofit grant schemes have been trialled for the commercial sector. Transport measures, including the recalibration of taxation to promote efficient vehicles, have also contributed significant savings.

Public sector 33% target

To demonstrate the leading role of the public sector in driving delivery of energy efficiency improvements, and to demonstrate the benefits available, a specific 33% savings target has been set for the public sector for 2020, equivalent to 3,240 GWh. Savings achieved in the public sector to the end of 2010 represent 20% of the target. The Public Sector Programme and Better Energy Workplaces (public sector) will be the main delivery agents for the remainder of the target.

Table 1: Targets, progress and ambition

	Energy Services Directive 2016 9% target (non-ETS only)	National 2020 20% target (whole economy)	Public sector 2020 33% target
Target (GWh)	13,117	31,925	3,240
Progress to 2010 (savings achieved)	37%	26%	20%
Estimated 2016 savings	131%	66%	60%
Estimated 2020 savings	n/a	107%	100%

Improvements to new and existing public-sector buildings made through demonstration programmes and grant schemes have contributed most savings to date in the public sector. This includes efficiency gains through the deployment of cogeneration and renewable heating sources. Public transport efficiency improvements have also been achieved.

Table 1 above summarises progress made towards achieving the three targets outlined above. A detailed breakdown of savings from measures to the end of 2010, and estimated contributions from existing and future measures, is provided for each target in Table 2.

2016 Target: Energy Savings Achieved and Projected

The following table provides savings estimates for the same list of actions as above, but includes only savings achieved in the non-ETS sectors that are eligible for accounting against the ESD target. These estimates are made for the period to 2016, reflecting the applicable period of the 9% reduction target for the ESD, equivalent to 13,117 GWh.

¹⁹ Target is expressed in primary energy equivalent (PEE) terms. The conversion from final energy consumption to primary energy equivalent is based on a standardised factor 2.5 for electricity (Annex II, Energy Services Directive). It accounts for the conversion losses in electricity generation and makes units of different energy streams more comparable.

²⁰ S.I. 542 of 2009, European Communities (Energy End-use Efficiency and Energy Services) Regulations 2009

²¹ As defined in Directive 2003/87/EC

Table 2: Savings estimates for relevant non-ETS sectors by 2016

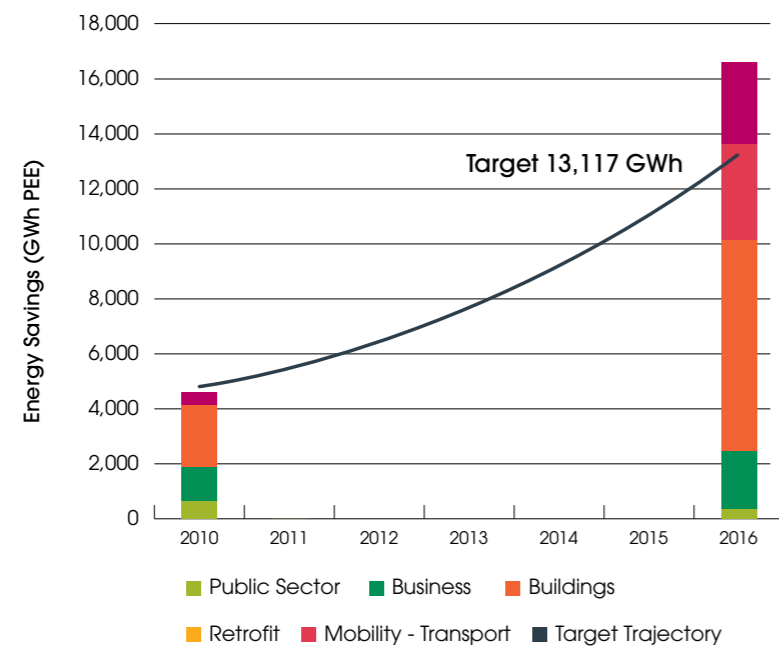
	Energy savings (GWh PEE)		CO ₂ savings (kt)	
	2010	2016	2010	2016
Public Sector				
Public Sector Programme	75	645	17	149
Green Public Procurement (via ACA)	25	155	5	33
SEEEP and EERF (public sector)	90	90	21	20
Public Sector Building Demonstration Programme	140	140	33	32
CHP (public sector)	120	160	29	38
ReHeat (public sector)	110	125	26	30
Public transport efficiency	90	160	23	40
Better Energy (public sector)	0	500	0	114
Business				
SEAI Large Industry Programmes	320	445	80	107
SEAI SME Programme	150	400	36	91
ACA (private sector)	55	370	13	80
SEEEP and EERF (private sector)	175	175	42	41
CHP (private sector)	280	370	68	90
ReHeat (private sector)	250	290	61	70
Better Energy (commercial sector)	0	500	0	114
Buildings				
2002 Building Regulations – Dwellings	1,280	1,280	312	312
2008 Building Regulations – Dwellings	85	1,210	21	295
2011 Building Regulations – Dwellings	0	380	0	93
Building Regulations – Nearly Zero-Energy Dwellings	0	15	0	3
2005 Building Regulations – Buildings other than dwellings	185	300	45	72
2012 Building Regulations – Buildings other than dwellings	0	390	0	93

Energy-efficient boiler regulation	200	800	49	195
Domestic Lighting (Eco-Design Directive)	200	1,200	47	259
Greener Homes Scheme (GHS)	120	120	28	28
Warmer Homes Scheme (WHS)	125	130	33	33
Home Energy Saving (HES) scheme	365	365	90	90
Smart Meter rollout	0	375	0	80
Better Energy Homes (residential retrofit)	0	3,000	0	740
Mobility – Transport				
Electric vehicle deployment	0	265	0	68
Vehicle registration tax (VRT) and annual motor tax (AMT) rebalancing	185	825	47	211
Improved fuel economy of private car fleet (EU regulation)	190	1,575	48	402
More efficient road traffic movements	0	375	0	96
Totals	4,815	17,130	1,175	4,120

The main differences between the above table and the 2020 target table are the exclusion of savings in the ETS sector, namely: electricity supply-side savings and a reduction in the contribution from the large industry programmes, much of which relates to companies participating in the EU ETS.

On the basis of the estimates above, Ireland will surpass its 2016 target of 13,117 GWh with a full rollout of the measures detailed above. Figure 6 on the next page summarises the savings contributions from different sectors.

Figure 6: Achieved 2010 and estimated future savings contributions to the 2016 ESD target



20% Target: Energy Savings Achieved and Projected

The following table includes some completed actions (to the end of 2010), some ongoing, and some committed future actions, such as future building regulations.

Table 3: Energy savings actions to 2020

	Energy savings (GWh PEE)			CO ₂ savings (kt)		
	2010	2016	2020	2010	2016	2020
Public Sector						
Public Sector Programme	75	645	1,255	17	149	281
Green Public Procurement (via ACA)	25	155	285	5	33	59
SEEEP and EERF (public sector)	90	90	90	21	20	20
Public Sector Building Demonstration Programme	140	140	140	33	32	31
CHP (public sector)	120	160	185	29	38	45
ReHeat (public sector)	110	125	125	26	30	30
Public transport efficiency	90	160	160	23	40	40
Better Energy (public sector)	0	500	1000	0	114	223
Business						
SEAI Large Industry Programmes	1,595	2,235	2,730	398	539	642
SEAI SME Programme	150	400	505	36	91	113
ACA (private sector)	55	370	690	13	80	140
SEEEP and EERF (private sector)	175	175	175	42	41	40
CHP (private sector)	280	370	430	68	90	104
ReHeat (private sector)	250	290	290	61	70	70
Better Energy (commercial sector)	0	500	1,000	0	114	223
Buildings						
2002 Building Regulations – Dwellings	1,280	1,280	1,280	312	312	312
2008 Building Regulations – Dwellings	85	1,210	2,110	21	295	514
2011 Building Regulations -Dwellings	0	380	835	0	93	203
Building Regulations – Nearly Zero-Energy Dwellings	0	15	225	0	3	55
2005 Building Regulations – Buildings other than dwellings	185	300	300	45	72	71

2012 Building Regulations – Buildings other than dwellings	0	390	865	0	93	205
Energy-efficient boiler regulation	200	800	1,200	49	195	293
Domestic Lighting (Eco-Design Directive)	200	1,200	1,200	47	259	242
Greener Homes Scheme (GHS)	120	120	120	28	28	28
Warmer Homes Scheme (WHS)	125	130	130	33	33	33
Home Energy Saving (HES) scheme	365	365	365	90	90	90
Smart Meter rollout	0	375	625	0	80	126
Better Energy Homes (residential retrofit)	0	3,000	6,000	0	740	1,476
Mobility – Transport						
Electric vehicle deployment	0	265	690	0	68	175
Vehicle registration tax (VRT) and annual motor tax (AMT) rebalancing	185	825	655	47	211	168
Improved fuel economy of private car fleet (EU Regulation)	190	1,575	3,015	48	402	769
More efficient road traffic movements	0	375	715	0	96	182
Aviation efficiency	255	255	255	65	65	65
ReHeat (private sector)	250	290	290	61	70	70
Better Energy (commercial sector)	0	500	1,000	0	114	223
Energy Supply						
Electricity generation efficiency improvements	1,690	1,675	4,055	422	293	524
Transmission and distribution savings	275	325	360	66	71	73
Totals	8,310	21,175	34,060	2,046	4,980	7,665

The table on the previous page does not represent a comprehensive list of all actions being undertaken to improve energy efficiency. Many cross-sectoral and underpinning measures for which an energy savings estimate has not been made are detailed elsewhere in this plan. The table includes those actions that are more readily quantifiable, either by estimation or some combination of measurement and extrapolation. The methods used for arriving at these estimates are in line with EU guidelines (where available) and are detailed further below and in Annex 1.

Sector Summary

Public Sector

Contributions have already been made in the public sector through recent grant schemes – Supports for Exemplar Energy Efficiency Projects (SEEEP) and Energy Efficiency Retrofit Fund (EERF) – and through deployment of CHP and renewable-heat technologies (ReHeat), both of which provide efficiency improvements over conventional energy sources. Most future savings required to meet the 33% public-sector target by 2020 will be achieved through the recently launched Public Sector Programme supporting strategic energy management in the sector.

Business Sector

The most significant contribution in this sector will come from supports provided by the SEAI to large industry in Ireland. These savings stem from working closely with over 150 of the largest energy-using companies in Ireland, accounting for around 70% of industrial energy use. Other key areas of opportunity being exploited include supports provided to SMEs to realise energy savings, and the availability of tax breaks (via the Accelerated Capital Allowance scheme) that provide further

incentives for deployment of the most energy-efficient technologies on the market today.

Buildings

The incremental improvement of building regulations in both the domestic and commercial sectors (via Better Energy) will continue to provide a valuable contribution to energy savings targets in the future as we seek to ensure all new construction is to the highest energy standards possible. Separate regulations for efficient lighting through the phasing-out of incandescent lightbulbs and for high efficiency boilers are also providing significant savings, in particular in the residential sector.

The retrofit of our buildings in both the public and private sectors holds the strongest potential for energy savings – a fact recognised across the EU as member states work to improve the standards of the building stock, which will be occupied for many years to come. The Better Energy Programme will be the mechanism through which such upgrades will be achieved.

Mobility – Transport

Mandates at EU level requiring improvement to the internal combustion engine will lead to significant savings. These are being supplemented well in Ireland by changes to motor vehicle and registration taxes to promote the purchase of low-emission vehicles, a policy that has already had a powerful effect on vehicle purchasing patterns. The deployment of electric vehicles also holds potential in Ireland where it is currently supported by a grant scheme for their purchase. The incorporation of efficient driving requirements into road licensing tests as well as training courses will also make a valuable contribution.

Energy Supply

Improvements in the efficiency of electricity generating stock as a whole reduces the amount of primary energy (fuels) needed to generate a unit of electricity. Upgrades of older plant with new efficient plant, expected between now and 2020, together with increased rollout of renewable generation (e.g. from wind) will provide a significant input to achieving the savings targets.

The figure below indicates the savings achieved to the end of 2010 and those expected from the various policies and measures outlined up to 2020. As we approach 2020 and the imperative for energy efficiency gains momentum, the rate of per annum savings required to meet our target increases. As can be observed below, demand-side measures on their own are not currently estimated as being sufficient to reach our target. Improvements on the supply side, including improved efficiency of

electricity generation, will be required to realise our 2020 target.

Public Sector Target: Energy Savings Achieved and Projected

A breakdown of energy savings achieved to the end of 2010, and expected to 2020, in the public sector is provided in Table 4 below. When savings due to improved efficiency of the public transport fleet are taken into account, measures delivered to date account for around 18% of the public sector energy savings target of 3,240 GWh.

Realising energy efficiencies in the public sector is one of the key actions underpinning this Action Plan. Not only will the achievement of the 33% target make a substantial contribution to the overall 20% target, it will also greatly reduce the cost of running the public service. As outlined above, a

number of programmes and grant schemes are in place to support the delivery of the public-sector target, central to which is the monitoring and verification system that was piloted in 2011 and was rolled out in 2012. The establishment of a dedicated programme of supports for public-sector bodies to support achievement of the remainder of the target is further outlined in the public-sector chapter of this plan.

It should be noted that the mix of measures outlined above is subject to change between now and 2020, and represents one possible combination of measures that might be sufficient to reach our goal. As the priorities of an evolving economy change or as new technologies become available, for example, between now and 2020, some measures will be phased out and new ones introduced to take their place.

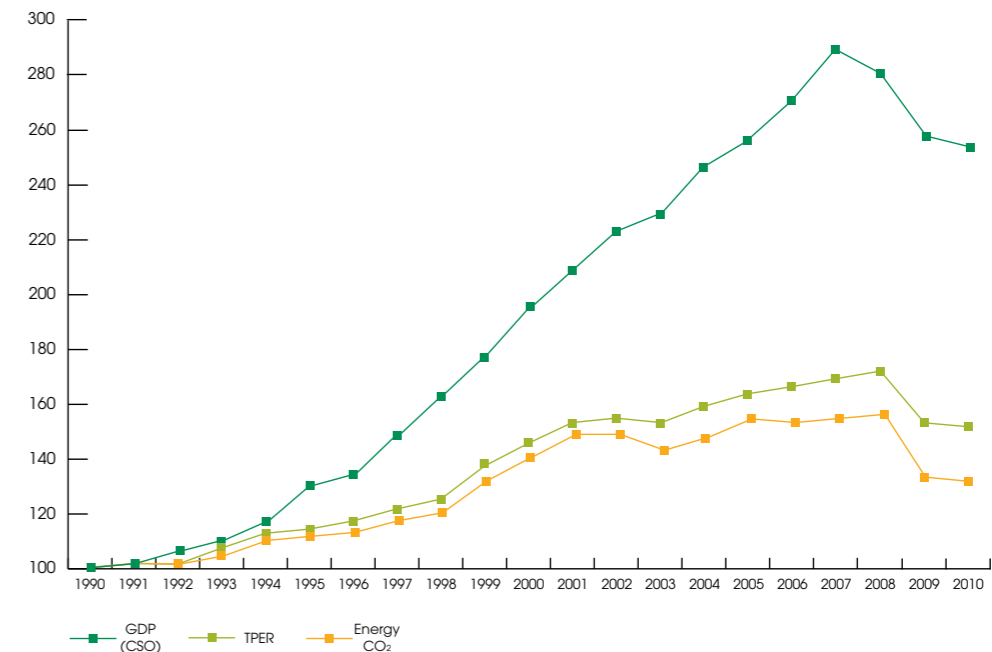
CO₂ Targets: Emissions Avoided and Expected

An ancillary benefit of energy efficiency savings is the avoided CO₂ emissions, estimated at over 2m tonnes in 2010 and 5m tonnes in 2016. If the full 20% efficiency target is achieved in 2020, total CO₂ emissions savings of 7.7m tonnes are estimated. This reduction is equivalent to emissions from around 1m homes or 3.5m passenger cars by 2020.

Table 4: Achieved and expected savings in the public sector

	Energy savings (GWh PEE)			CO ₂ savings (kt)		
	2010	2016	2020	2010	2016	2020
Public Sector Programme	75	645	1,255	17	149	281
Green Public Procurement (via ACA)	25	155	285	5	33	59
SEEEP and EERF (public sector)	90	90	90	21	20	20
Public Sector Building Demonstration Programme	140	140	140	33	32	31
CHP (public sector)	120	160	185	29	38	45
ReHeat (public sector)	110	125	125	26	30	30
Better Energy (public sector)	0	500	1,000	0	114	223
Public transport efficiency	90	160	160	23	40	40
Total	650	1,975	3,240	155	455	730

Figure 7: Relationship between economic growth (GDP) and energy demand (Total Primary Energy Requirement) and energy-related CO₂ emissions



Challenge of Realising Savings Ambitions

Much of the ambition for future savings is accounted for within the building sectors; broad-scale retrofit (via Better Energy) and ongoing improvements to Building Regulations are required to deliver on targets. An ongoing focus on large industry is required, together with maintenance of tax incentives for energy efficiency products in the tertiary sector. Promotion of sustainable energy management in large energy-using public-sector entities will also play a major role in future achievements. Green public procurement represents a further opportunity for efficiency gains in the sector. Improved efficiency of passenger vehicles and taxation measures will drive future transport savings.

Energy demand is historically coupled to economic growth. In other words, as the economy grows, energy demand traditionally increases also. However, in recent years demand and growth are progressively being decoupled due to greater efficiencies and reduced economic output. With reduced economic activity (since the beginning of the recession in 2007), energy demand has also declined. However, on the basis that our energy savings targets are calculated as a fixed amount of energy savings in 2016 and 2020 (based on historic energy demand over the period 2001 to 2005), this reduction does not contribute to our targets. Only actions taken explicitly by householders, businesses and the Government to improve the *ratio between an output of performance, service, goods or energy, and an input of energy count as an energy saving* in the context of our targets.

Achieving the targets is thus more challenging than ever. The economic downturn has put additional pressure on large and small businesses, and on householders, reducing their ability to self-finance

energy efficiency improvements and limiting their access to capital. The role for Government to facilitate and encourage investment and demonstrate the benefits of investment in energy efficiency is more important than ever.

Chapter 03

The Public Sector

2020 Vision

The public sector will improve its energy efficiency by 33% and will be seen to lead by example – showing all sectors what is possible through strong, committed action.

Achieving the Vision

- Central advice and monitoring services will be established to support public bodies to structure their efforts by incorporating energy management into their culture and decision-making processes.
- Public procurement guidelines will be developed to encourage consideration of energy efficiency across all public procurement.
- Public-sector experiences will be used to publicise innovations and actions that others can take to improve their efficiency.
- Energy monitoring, reporting and verification will be embedded in the public bodies' culture and business processes.

Introduction

The public sector's annual energy spend amounts to some €500 million. This considerable purchasing power can be leveraged to promote the market to provide energy-efficient goods and services. The SEAI's experience is that proven management and technology solutions can deliver substantial savings in energy use. This can release valuable funds where they are needed: for delivering public services.

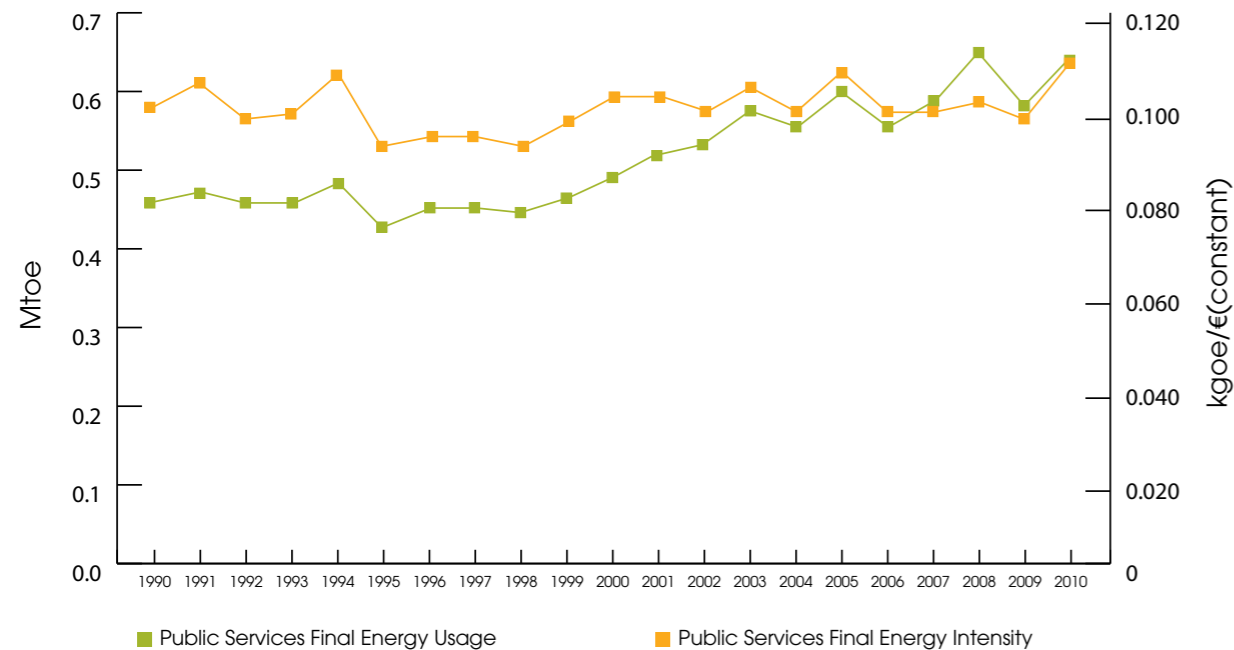
If approached systematically, the public sector can act as an early user and pioneer of new and efficient technologies, thereby demonstrating their feasibility to the private sector.

Furthermore, in fulfilling its exemplar role, the public sector sends a very important leadership signal. By demonstrating its commitment to excellent energy performance, the sector can provide confidence to others in the market that there is an exciting and profitable future for technologies and services that emphasise energy efficiency. Although the public sector consists of a diverse set of institutions and activities, with equally diverse patterns of energy use, effective energy management is the common goal for making valuable energy savings in the short term, for sustaining those savings over time and for achieving the ambitious 2020 target.

Good energy management practices provide a framework for success by helping public bodies to get organised. A critical enabler is to secure senior-level management commitment to motivate behavioural change in staff. Above all, embedding sound energy management structures facilitates good decision-making on four key aspects of energy efficiency: designing, procuring, and operating and maintaining buildings, equipment, vehicles and infrastructure.



Figure 8: Energy usage in the public services sector



The best available data for the public sector is derived from services-sector data, which is set out in the National Energy Balance²² (produced annually by the Energy Policy Statistical Support Unit in the SEAI). Total services-sector energy demand is calculated as a residual following determination of the final energy use in the industrial, residential and transport sectors. The services sector consumption is then split between public-sector and commercial services, based on an estimated ratio. The 2010 energy balance attributes 645 ktoe (7,500 GWh) total final consumption to the public sector. This is equivalent to 11,380 GWh in primary energy terms.

The SEAI and the Department initiated a three-year project to establish a robust monitoring and reporting system. This has enabled public bodies to report on their energy consumption since 2011 (in accordance with their reporting obligations under S.I. 542 of 2009). To date almost 28,300 Meter Point Reference Numbers (MPRNs) and nearly 2,400 unique Gas Point Registration Numbers (GPRNs) have been collated into a single National Public Sector Energy Database.²³ The aggregate electricity consumption through the MPRNs in the database amounted to approximately 4,400 GWh in 2010 (TPER), while for gas the aggregate energy consumption amounted to about 1,500 GWh in 2010 (TPER).

²³ An MPRN is a Meter Point Reference Number which is a unique number assigned to every single electricity connection and meter in the country. A GPRN is a Gas Point Registration Number which is a unique reference number assigned to every gas point on the natural-gas network.

²² http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_1990-2009.pdf

The main public sector energy consumers are:

- Public-sector buildings, which primarily consume electricity, natural gas and oil-based fuels as well as smaller amounts of renewable and solid fuels. These include offices, hospitals, clinics, nursing homes, schools, prisons, barracks and garda stations. Altogether, there are over 10,000 public-sector buildings, about 2,100 of which are managed by the Office of Public Works (OPW).
- Utilities, which primarily consume electricity – e.g. local authority water services facilities, street lighting.
- Public transport fleets, which primarily consume diesel, gasoline and electricity – e.g. Iarnród Éireann, Bus Éireann.
- Other transport fleets, which primarily consume diesel and gasoline – e.g. ambulances, local authority vehicles, Defence Forces vehicles.

The 33% target applies to all energy consumed by public bodies, including energy sourced from electricity, fossil fuels, renewables, transport fuels and fuels used for plant and machinery.

ONGOING NEEAP 1 ACTIONS

Public Sector Programme

The SEAI's Public Sector Programme was established in 2009 to provide a range of integrated supports to help public-sector organisations realise valuable energy savings and work towards the 33% target. The focus of the programme is to underpin public bodies' own efforts in reaching the target by embedding an energy management culture in the public sector.

1. We are supporting public-sector bodies through the Energy Partnership programme.

Previous NEEAP action text: We will establish a high-level Working Group to draw up an Action Plan for achievement of the 33% energy savings target for the public sector.²⁴

The SEAI Partnership Programme helps public-sector bodies to work towards the 33% target, while saving money, improving the environment and meeting national obligations, by reducing their energy usage. It engages at senior management level in organisations and provides tailored support, delivered in partnership with those organisations that demonstrate commitment to strategic energy management.

In November 2010, a group of 14 leading public bodies committed to the SEAI's Energy Partnership initiative to deliver total cumulative energy savings of €330 million by 2020. This initial group, which have a combined annual energy spend in excess of €200 million, is expected to be joined by other public bodies across the sector, committing to similar energy savings by implementing energy efficiency measures.

²⁴ Where appropriate we have updated the text of existing actions as necessary to reflect policy developments. The text in italics is from the first NEEAP.

Case Study: The bulk of Bus Éireann's annual energy consumption is the fuel used by its vehicle fleet (over 30m litres of diesel per annum). This provides the greatest potential for energy saving, so Bus Éireann and the SEAI have been working together through the Energy Partnership Programme to develop an eco-driving training programme. ECO-driving trials with drivers from Bus Éireann's Kells, Co. Meath depot in September 2009 demonstrated that savings are possible in test conditions, and a programme was carried out for the training of a further 245 drivers in 2010. Bus Éireann is aiming for at least 5% savings in real traffic and road conditions. Eco-driving will also reduce the company's emissions.

In addition, energy-efficient lighting was installed in the Waterford and Broadstone garages, with approximately 7% reductions in electricity bills. Lighting upgrades are now planned for other garages across the country.

2. **We are facilitating and enabling the exchange of energy efficiency best practice between public-sector bodies at local, national and international level.**

Previous NEEAP action text: We will put in place mechanisms to facilitate and enable the exchange of energy efficiency best practice between public-sector bodies at local, national and international level.

Best Practice Energy Assessments

Since 2009, the SEAI has provided free, one-to-one advice and mentoring to over four hundred public-sector facilities through its Advice Mentoring & Assessments service. This service is delivered by expert energy advisors that help and motivate these organisations to assess their own energy use, identify opportunities for savings and take action to realise savings. To date, the participant public-sector facilities have achieved 75 GWh in annual savings.

Best Practice Working Groups

In June 2009, the SEAI established three energy efficiency working groups in the fields of Water Services, Public Lighting and Information Communications Technology. Each working group comprised participants from both central and local governments as well as the private sector. The goal of each group is to help set public bodies on a pathway to designing, procuring, operating and maintaining relevant energy users in an efficient and effective manner. The main work activities undertaken included the assessment of energy performance in each sector and the identification of opportunities for savings that have wide applicability across each sector.

Case Study: There are approximately 420,000 public lights in Ireland, ownership of the vast majority of which resides with local authorities, consuming about 205 GWh of energy annually. Public lighting represents 15-35% of total energy usage in a typical local authority.

The Public Lighting Working Group implemented targeted work-streams to develop standard solutions for the sector. The group also identified best-practice projects already implemented and considered the scope for replication.

The group concluded that there is much scope for achieving valuable energy savings in the sector; for poorly performing systems (of which there are many), opportunities exist for up to 20-30% savings. The primary source of opportunity lies in improving the design and procurement of systems to integrate new lighting and maintenance technologies.

The group developed a clear vision for energy efficiency in public lighting and outlined a roadmap for overcoming challenges and for setting local authorities on the road to achieving the vision.

In 2011, the SEAI established a new working group on Financing Retrofit in the Public Sector. The focus of this group is to facilitate the development of a market for innovative models based on the concepts of energy performance contracting through networking and best-practice sharing.

3. **We are supporting the integration of Energy Efficient Design into capital projects.**

Previous NEEAP action text: We are supporting exemplary design and energy management practice by public sector organisations through SEI's²⁵ Public Sector Building Demonstration Programme.

It pays to both consider and integrate energy efficiency at the earliest stage possible in capital projects. Since 2009, the SEAI has provided bespoke, one-to-one advice to public bodies on integrating the principles of energy-efficient design (EED) in energy-intensive capital projects. EED is a methodology that facilitates the design, construction and management of projects so that they consume the minimum quantity of energy during subsequent operation. EED is always driven by a sound 'business case', i.e. it either lowers overall project capital expenditure or has a very short payback when operational savings are accounted for.

In 2009 and 2010, the SEAI supported eight EED reviews for large capital projects, including the National Paediatric Hospital, Metro North, a new school development and several water services facilities.

Case Study: An energy-efficient design review was carried out on the upgrade of the wastewater treatment plant at Osberstown, Co. Kildare. The detailed design of the plant was largely complete, so the scope of the review was limited to suggesting improvements to optimise that design. The main element of the review was a one-day workshop attended by the local authority, the design consultants and an SEAI EED expert.

Even with limited intervention, the EED review identified a package of annual energy savings of the order of €177,000, with an estimated investment cost of €193,000. Over 20 years, the package will deliver an estimated €3.5 million worth of savings. The same approach is currently being rolled out for other proposed projects in Kildare County Council.

4. **We are providing funding support for Energy Efficiency Projects in the public sector.**

Previous NEEAP action text: We will introduce energy efficiency programmes for Government Departments, State Agencies, Local Authorities, the Health Service and all other areas of the public sector.

Beginning in 2008 with the Support for Exemplary Energy Efficiency Projects (SEEEP), followed by the Energy Efficiency Retrofit Fund (EERF) and more recently the Better Energy Workplaces (BEW) Scheme, the State is providing Exchequer support for the public sector to undertake energy efficiency measures. In 2011 the 85 projects funded under BEW delivered €11 million in energy savings, with a one-year payback on the State's investment.

5. **We are working together with Local Authorities to reduce their energy consumption.**

Previous NEEAP action text: We are localising the delivery of energy efficiency measures through the Local Energy Agencies.

²⁵ Now the SEAI.

Altogether, local authorities spend about €110 million annually on energy, most of which is consumed by water services facilities and public lighting. In cooperation with local energy agencies, and with support from the County and City Managers Association (CCMA), the Water Services National Training Group (WSNTG), the Department of Environment, Community & Local Government and the SEAI, many local authorities have set out on the path to achieving substantial energy savings by 2020.

Since 2009, the SEAI has worked with over twenty local authorities through its working groups and suite of public-sector support offerings. In a 2011 survey of energy management in local authorities undertaken by the CCMA in conjunction with the SEAI and the WSNTG, a total of 384 energy-saving initiatives were reported as having been implemented since 2008 – with estimated combined savings of €5.4 million per annum.

6. We have developed a framework for energy-efficient public procurement.

Previous NEEAP action text: We will introduce Guidelines for Green Public Procurement.

Better Procurement

National Procurement Service Framework Contracts

The National Procurement Service (NPS) provides a central procurement service for government departments, local authorities and agencies. It places contracts for a variety of goods, supplies and services, including electricity, natural gas, petroleum products and biofuels.

The NPS has established a framework agreement to facilitate the purchase of electricity for the public service. The overall potential value of the electricity framework is €920 million over the four-year period of the contract. It specifies the proportion of

electricity required to be generated from renewable sources. These proportions follow the national policy requirements, which stipulate that the annual target to be achieved in 2011 is 24.6%, rising to 40% in 2020.

By April 2012 the NPS had successfully run aggregated competitions for the supply of electricity to central government, vocational education committees (VECs), local government and universities. Through these competitions the NPS has exceeded the national policy annual targets in the area of renewable sources. An associated project with DCENR and SEAI has enabled the NPS to contribute a large amount of energy data to what may become the first public-service national energy database.

In all other frameworks or contracts established by the NPS, full cognisance is taken first of any national policy that needs to or can be given effect through the procurement process. As required, appropriate specifications are written to ensure that the output of the resultant contract complies with the national targets and guidelines.

Framework for Energy Efficient Procurement

In January 2012 the Government launched *Green Tenders – An Action Plan for Green Public Procurement* with a view to assisting public authorities to successfully plan and implement green public procurement (GPP) by highlighting existing best practice and outlining further actions to be taken to boost green public procurement. Chapter 7 of *Green Tenders* focuses on the energy sector. The role of the public sector in GPP can be an important element in driving the energy efficiency agenda in the wider context of climate change and energy policy.

Energy-efficient procurement is better procurement because it results in financial savings over the useful life of the product, as well as environmental

savings. The European Communities (Energy End-use Efficiency and Energy Services) Regulations 2009 require public bodies to fulfil an exemplary role with regard to energy efficiency. More specifically, the EU (Energy Efficient Public Procurement) Regulations 2011 oblige public bodies to only purchase equipment from the Triple E Register of energy-efficient equipment.

Public procurement should take energy efficiency into account so as to help Ireland's public sector to meet the 33% energy efficiency improvement target for 2020 under the NEEAP.

The SEAI, DECLG and DCENR have developed a three-part framework for energy-efficient procurement, which is presented in Chapter 7 of *Green Tenders – An Action Plan for Green Public Procurement*. The framework helps public bodies to undertake energy-efficient procurement by improving what they procure and how they procure. Energy-efficient procurement not only reduces energy consumption and delivers environmental benefits, it also saves money. Each part of the framework addresses one of the following three broad categories of purchases:

- Energy-using products – e.g. purchasing or leasing equipment, vehicles or buildings, implemented in legislation by S.I. 151 of 2011.
- Energy services: procuring a service directly related to the use of energy – e.g. design and implementation of energy-efficiency retrofit works or an onsite power generation solution, provision of locally generated energy supplies.
- Capital projects – e.g. constructing a new building, wastewater plant or hospital.

NEW ACTIONS

We have established a framework to achieve the vision set out and to fully embed energy efficiency in the public sector, assisting it in achieving the 33% target and fulfilling related obligations. This framework will enable public bodies to take strong, committed action.

Legislation

7. We have introduced several important pieces of legislation to promote energy efficiency in the public sector

- The European Communities (Energy End-Use Efficiency and Energy Services) Regulations 2009 (S.I. No. 542 of 2009) transpose Directive 2006/32/EC into Irish law. The regulations set out several obligations on public bodies with respect to their exemplary role in energy efficiency, putting in place obligations and standards for energy-efficient procurement, energy management practices, energy audits, the use of energy-efficient buildings and annual reporting on the actions being taken to improve energy efficiency.
- The European Union (Energy Efficient Public Procurement) Regulations 2011 (S.I. No. 151 of 2011) amend the energy-efficient public procurement provisions of S.I. No. 542 of 2009. The new regulations include an obligation on public bodies to only purchase or lease equipment or vehicles that meet the energy efficiency criteria published by the SEAI for relevant product categories on the Triple E Register of energy-efficient equipment.
- The Triple E Register is a benchmark list of 'best in class' energy-efficient products, managed by the SEAI. Typically, Triple E products are 10-15% more energy-efficient than standard alternatives and have reduced energy running costs. On a lifecycle basis, they can achieve significant energy savings.

- The European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147 of 2011) transpose Directive 2009/28/EC into Irish law. These regulations require public bodies to fulfil an exemplary role in the context of the directive, when constructing or renovating public buildings.

8. The OPW will continue to operate the Optimising Power @ Work programme in support of public-sector energy savings targets.

The state-wide energy conservation campaign titled Optimising Power @ Work (Phase 1) was launched in January 2008 and ran until May 2010. Phase 2 began in June 2010 and is expected to conclude in 2013. The aim of Phase 1 was to achieve a reduction of 15% in total annual CO₂ emissions in each of about 250 large (>1000m²) buildings located throughout the country, which are owned/leased by the OPW for use by government departments and agencies. The main focus of the project was the implementation of an intensive staff energy awareness campaign in

each building, at the same time ensuring that the buildings were being operated in the most efficient manner possible with respect to all energy-consuming processes, while maintaining or improving comfort conditions. The project also included basic energy audits of the buildings.

Phase 1 of the initiative delivered average total savings of approximately 12.0% in CO₂ emissions. The reported savings are calculated against a benchmark year, which for most buildings was 2007 (the year prior to commencement of the campaign).

One of the main factors that influenced the level of savings achieved in a particular building was the level of staff engagement. The graph below shows the average CO₂ savings achieved for the various categories of engagement:

It is interesting to note that buildings that did not participate in the campaign in Phase 1 (but where monitoring had been installed) increased their

emissions on average by 11% over the 2 year period of Phase 1.

It is essential that the savings already achieved be maintained; experience shows that without intervention the buildings will quickly revert to their pre-campaign consumption levels. Phase 2 of Optimising Power @ Work began in June 2010. The main aims of Phase 2 are to achieve:

- 1 20% average saving in CO₂ emissions across the 250 buildings in the campaign.
- 2 Minimum saving of 15% in CO₂ emissions in each building – i.e. those buildings that did not achieve a 15% saving in Phase 1 will be intensively targeted in Phase 2 to improve their performance.
- 3 5% further reduction in CO₂ emissions in buildings that have already achieved (in Phase 1) in excess of the 20% target.

The next phase of the OPW campaign will be to target smaller buildings with floor areas between 500m² and 1000m². Energy-logging equipment will first be installed in these. A number of pilot studies will then be conducted to ascertain the scope for savings and the most effective measures that can be undertaken.

In the longer term, buildings in the portfolio with floor areas of <500m² will be targeted. It is unlikely that the energy spend in these will justify the installation of dedicated energy monitoring equipment, so a tailored energy information campaign will be designed for these.

9. The Department of Education and Skills will continue to improve the energy efficiency of existing schools and construct highly efficient school buildings.

The Department of Education and Skills is at the forefront of design with respect to sustainable energy efficiency in school buildings. This performance has been recognised at both national and international level over the past fifteen years with sustainable energy awards for excellence in design and specification.

The Department's Technical Guidance Document (TGD) sets the benchmark for sustainable design in school buildings, with a clear focus on energy efficiency. This approach is supported by a strong research programme, with 39 research projects at various stages.

The Department is constructing two schools to the passive house standard – the world's leading low-energy building standard. Feedback from the two schools will inform future school design and identify the optimum level of passive design opportunities for incorporation in Irish school design standards. All primary schools (first-level) built in accordance with the TGD are capable of achieving an A3 Building Energy Rating (BER) and all post-primary schools (second-level) are capable of achieving a B1 BER.

In addition to 56 major school building projects underway in 2012, the Minister for Education and Skills has announced details of 219 major school building projects which will begin over the next five years, as part of a €2 billion capital investment programme.

The SEAI and the Department are developing a number of strategic projects with the aim of helping schools to reduce energy costs and thus concentrate more resources on their core function – delivering education. These include projects to:

Figure 9: Average CO₂ savings related to extent of engagement



- Stimulate the market for deep energy efficiency retrofit projects in cohorts of schools using innovative procurement models (e.g. energy performance contracting, ESCos) – with a pilot project to commence in 2012/2013.
- Develop a package of supports and an online energy advice portal for schools – www.energyneducation.ie
- Explore on a pilot basis a metering and display programme for school energy and water consumption monitoring.

Organising for Success

Achieving the 33% target by 2020 will involve more than simply picking the 'low-hanging fruit'. It will require implementing a coherent strategy for change so that public bodies can tackle the energy efficiency challenge through comprehensive organisation-wide effort. To facilitate this, organising for success in the framework is about helping public bodies to structure their efforts by incorporating energy management into their culture and decision-making processes.

- 10. We will develop a suite of integrated programmes and supports to assist public bodies to comply with their obligations, meet national targets and achieve significant energy and cost savings.**

These programmes will build on the lessons learned through the SEAI's Public Sector Programme and expand the valuable relationships already in place between the SEAI and other public-sector stakeholders. Through the SEAI, we will develop partnerships with more public-sector organisations to foster long-term commitment to energy management and planning.

The SEAI will also work with strategic stakeholders to develop bespoke energy management structures and support programmes for specific sub-sectors – e.g. for local authorities (in cooperation with the County & City Managers Association, the Water Services National Training Group, the Local Government Management Services Board, local energy agencies and the DECLG), for schools (in partnership with the Department of Education & Skills) and for public buildings (with the Office of Public Works).

- 11. We will introduce an obligation on all public bodies to develop and implement energy management programmes appropriate for their organisations.**

As part of these programmes, all public bodies will be required to establish and implement annual action plans to make incremental progress year-on-year, and to identify and prioritise longer-term initiatives to achieve transformational change.

- 12. We will also introduce obligations on public bodies that spend more than €5 million annually on energy to fulfil an exemplar role in energy management by:**

- Publishing 3-year energy efficiency strategies.
- Formally setting energy efficiency objectives and targets and reporting on progress against them in their annual reports.
- Implementing the ISO 50001 Energy Management System.

- 13. We will introduce an obligation on public-sector bodies to invite proposals from the market for energy-saving solutions where the public body has an annual energy bill equal to or greater than €500,000.**

- 14. We will encourage the development of industry representative groups.**

The private sector can play an important role in enabling the public sector to achieve our targets. The SEAI will support the development of representative groups and will partner with them to overcome market barriers, to develop approaches for making best use of private-sector resources and capabilities, and to drive action on the ground.

Best Practices and Innovation

Our framework of actions involves the identification, promotion and implementation of appropriate best practices for public bodies. We will develop a suite of information resources based on international best practices and on the lessons learned from notable local success stories. We will facilitate the transfer of this knowledge to public bodies to empower them to take action.

- 15. We will build on the success of the three working groups set up by the SEAI to address energy efficiency in Water Services, Public Lighting and ICT by establishing new working groups to tackle the technological, organisational and cultural barriers to better energy performance in specific technology / end-user segments.**

A key aspect of the success of the working groups will be in requiring that all public lighting is efficient and effective, with lowest whole-life cost. A programme of replacement of inefficient street and traffic lighting will be developed, involving local authorities. We will require that all water and wastewater facilities will be designed, procured, operated and maintained in an efficient and effective manner.

- 16. We will provide independent expert energy advisors to undertake enhanced energy assessments at specific public sector facilities – to assist public bodies in identifying, targeting and achieving large-scale energy savings. This will help them to unlock the valuable energy savings potential that exists at their facilities by identifying the business case for action.**

- 17. We will introduce an obligation on public bodies that are contracting the development of capital projects with projected energy consumption in excess of 1 GWh per annum to formally integrate the principles of energy-efficient design in the project development phase. Public bodies must adhere to the overall appraisal principles and requirements of the new Public Spending Code in the first instance.²⁶**

This will help to integrate best practices in projects from the outset and minimise the life-cycle energy intensity of these developments. It will save money by reducing both capital costs (e.g. for utilities and processes) and operational energy consumption.

- 18. We will work together to overcome barriers to the deployment of innovative solutions and will disseminate lessons learned to all market participants.**

The SEAI will cooperate with other state agencies, such as Forfás and Enterprise Ireland, and other stakeholders to establish the public sector as a demonstration 'test bed' to trial innovative energy-efficient technologies and services.

- 19. We are facilitating the sharing and exchange of information on energy management between public bodies.**

²⁶ The Public Spending Code is available at: www.publicspendingcode.per.gov.ie

The Public Sector Energy Link, launched in May 2011, is a network for sharing and exchanging information, knowledge and real-life experience on energy management in the public sector. The networking takes place both online and through a series of workshops on topics of interest to members. Administered by SEAI, it helps public-sector professionals to get answers and solve problems through sharing and exchanging knowledge and experience on energy management with their peers in other public bodies.

We will continue to develop a high-level working group for public-body leaders and managers to liaise and network with policymakers. The objectives of this group will be to overcome practical barriers and share experiences among senior management and officials.

20. We will work with public bodies to fulfil their exemplar role with respect to building energy efficiency by:

- Developing an inventory of public-sector buildings by the end of 2013.
- Assisting public agencies to improve the operational Building Energy Ratings of their buildings to B3 (or better) by January 2012 and to A3 (or better) by January 2015.
- Encouraging the retrofit of up to 3% of central Government buildings each year.
- Requiring that each refurbishment bring the building(s) up to the energy performance level of the best 10% of the national building stock.
- Requiring that Display Energy Certificates be prominently displayed in all buildings that are occupied by public bodies and which have total useful floor areas over 500 m².
- Reducing the useful floor area threshold for Display

Energy Certificates to 250 m² for all buildings occupied by public bodies from 9 July 2015.

- Requiring that all new buildings occupied or owned by public bodies from 31 December 2018 be nearly zero-energy buildings.²⁷

Procurement and Funding

It is essential to fully integrate energy efficiency in all public procurement processes – by improving what public bodies procure and how they procure. Achieving this objective will require innovation in terms of how energy saving projects are financed.

21. The SEAI will develop materials and training to improve competence with respect to energy-efficient procurement in public bodies.

We will develop national guidelines, practical procurement templates and model forms of contract to help public bodies with the energy-efficient procurement of goods, services and capital projects. These resources will assist public bodies to align contractual arrangements with best practices in energy management, and will be consistent with the energy procurement guidance set out in the Green Public Procurement Action Plan.

22. We will investigate options for the provision of private and public finance for energy efficiency projects through innovative project-based financing arrangements.

Through the working group on Financing Retrofit in the Public Sector, we will work to identify and overcome the barriers that have limited the use (to date) of innovative procurement models based on the concepts of energy performance contracting. Such

²⁷ A nearly zero-energy building is a building that has a very high energy performance when determined in accordance with Annex I of Directive 2010/31/EU.

models can facilitate risk-sharing between the private and public sectors and reduce or eliminate the need for upfront investment by the public sector in deep energy efficiency retrofit projects.

Measurement and Verification

One of the core/central elements of our action framework is the embedding of energy monitoring, reporting and verification in public bodies' culture and business processes.

23. We will develop an energy monitoring and reporting system to satisfy the reporting requirements of both S.I. 542 of 2009 and the NEEAP, and to facilitate public bodies in reporting on energy efficiency in their annual reports.

This system will also help to inform the development of national policy and programmes, facilitate the generation of national statistics, provide inputs for the preparation of reports in fulfilment of Ireland's international reporting obligations, and facilitate the development of the energy services market. It will also be a useful tool for the SEAI to evaluate its public-sector programme offerings. The monitoring and reporting system will be implemented in phases to 2013.

We will publish a report on energy consumption in the public sector in 2013, and annually thereafter.

24. To achieve this, we will investigate and, where appropriate, develop and implement a methodology to formally assign robust and transparent energy-saving targets (by 2020) on an organisational, sub-sectoral or technology basis within the public sector.

The 2020 target is ambitious and delivering all of the required savings will be challenging to achieve for many organisations. Therefore, it is imperative that individual public bodies are motivated to work

towards clearly defined targets. This action will challenge those segments of the public service with the greatest potential to save energy to make the most significant contributions to the overall target.

We will identify appropriate project-level verification protocols and promote their use by public bodies to verify energy savings when implementing retrofit projects. This will help to stimulate the uptake of innovative procurement and financing arrangements for retrofit projects in the sector.

Case Study: The Department of Communications, Energy and Natural Resources and the SEAI have established a monitoring and reporting project team to deliver the system. Following a review of international best practices in the field, the team developed a detailed methodology for tracking progress towards the 33% target.

- The web-based system will enable public bodies to track their energy consumption, energy performance (e.g. in terms of their core activities using an appropriate energy performance indicator) and progress towards the 2020 target.
- It will add value for public-body users by enabling them to better understand energy consumption, target areas for improvement, identify opportunities, review progress, monitor & benchmark performance, and validate savings. It will also stimulate senior management in the public sector to fulfil an exemplary role with respect to energy efficiency by delivering pertinent information – and value – through an attractive scorecard-based metrics system.
- The system will use a baseline period of 2001-2005, but accommodate other baselines in the absence of this data. It will account for the persistence rates of different energy savings over time.

- It will accommodate the reporting of electricity, thermal and fleet consumption in a manner consistent with the fuel split used for national reporting purposes by the SEAI EPSSU. Energy consumption data for electricity and natural gas will be inputted directly from the databases operated by the regulated meter operators (ESB MRSO and Bord Gáis Networks). Public bodies will augment this automatic data-feed with self-reported data for non-network-connected energy consumption (e.g. oil, transport fuels, solid fuels).
- To minimise the data manipulation and reporting burden on public bodies, the system will share data with the Environmental Protection Agency's Carbon Management Tool and the National Procurement Service's energy procurement systems. The system will also be capable of being linked to a future Display Energy Certificates system. The system will incorporate a verifiable methodology for calculating energy savings that is easily understood, workable and robust, that can accommodate new entrants and can capture changes in activity over time.
- It will facilitate the allocation of energy efficiency targets.

In addition to developing the design concept for the system, the project team has:

- Developed guidance materials for public bodies describing their energy reporting obligations (see www.seai.ie/Your_Business/Public_Sector/Reporting/).
- Piloted the system with 18 public bodies, with a combined annual energy spend of €119 million.
- Managed the submission and collation of over 30,000 unique public-sector electricity and natural-gas meter numbers into a National Public Sector Energy Database. These meter numbers have been

categorised according to end-use type, location and public body, and then been submitted to the regulated meter operators, who returned historical consumption data associated with each.

- Developed a template and guidance materials to enable public bodies to report on their energy performance in their annual reports.

Beginning with the pilot phase and continuing over the coming years, the system will generate better energy consumption data for the sector. The 2011 pilot exercise and initial data exchange with the meter operators improved the quantity and quality of energy consumption data available; the consumption data gathered for 2010 accounted for 62% of the energy consumption reported for 'public services' in the National Energy Balance. The data returned indicated a disparity in the magnitude of energy consumption between different public bodies. For example:

- The 1% of MPRNs in the National Public Sector Energy Database that consumed the most electricity in 2010 (the 'biggest' MPRNs) accounted for 51% of the reported electricity consumption.
- The 'biggest' 10% of MPRNs consumed 85% of the reported electricity consumption in 2010.
- The 10 largest consuming public bodies consumed 48% of reported electricity consumption.

Significant data gaps exist and building a complete and accurate consumption profile for the sector will take several years.

The next step in the project is to procure a web-based software solution to implement the system.

Chapter 04

Energy Supply Sector

2020 Vision

The Irish energy sector will deliver competitively priced, low-carbon energy to all customers and assist them to use it as efficiently as possible.

Achieving the Vision

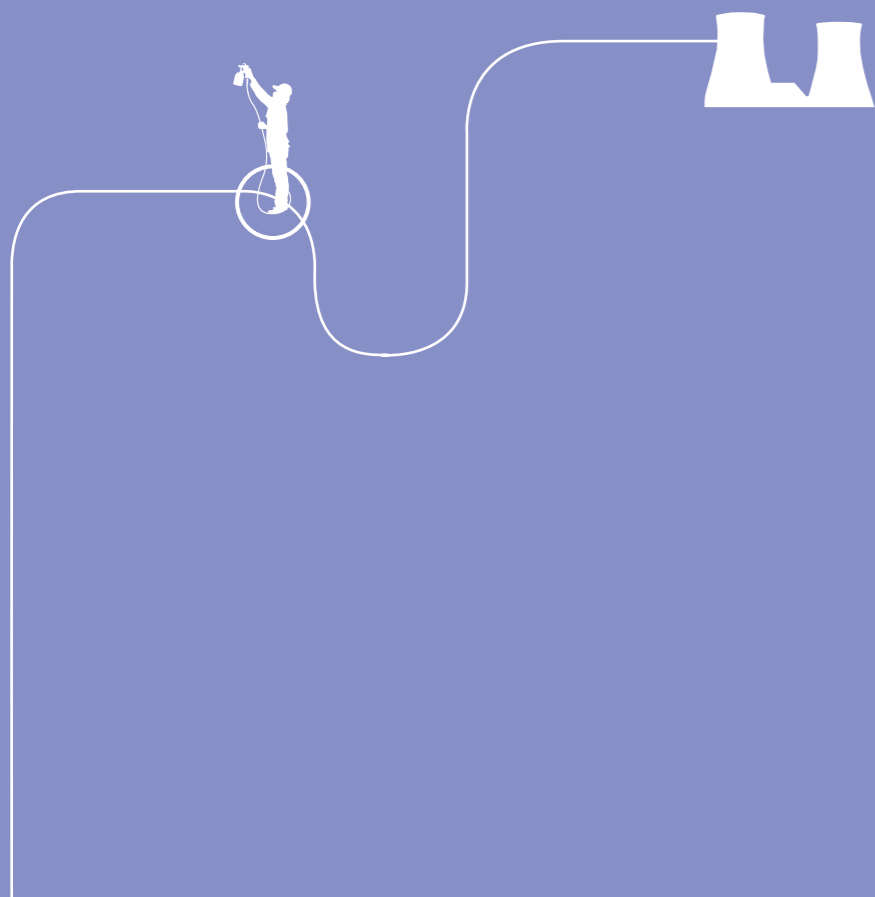
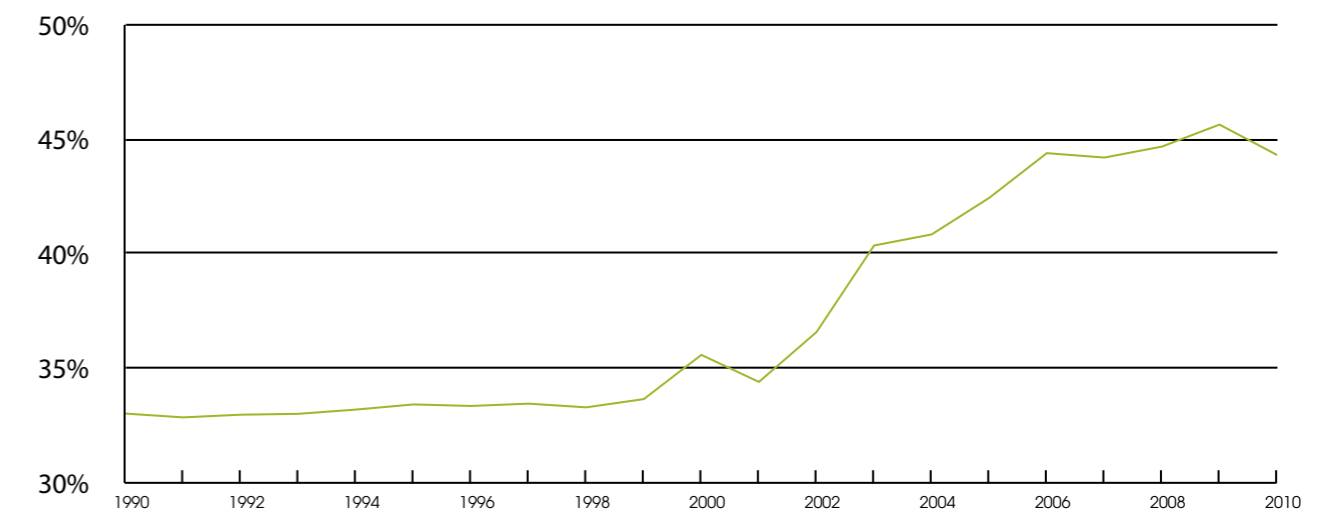
- Users will be empowered to monitor and regulate energy use through the rollout of smart metering technology.
- Market actors will contribute to demand-side energy savings through the delivery of energy-saving targets.
- Competition and choice will be promoted through the development of the all-island wholesale energy market and the national gas and electricity retail markets.

Introduction

The energy supply sector is of critical importance to the overall achievement of the national 20% target. Energy efficiencies will be realised from this area in two ways: the supply side and the demand side; both are necessary and offer strong energy saving potential.

The generation of electricity is characterised by the use of gas, with a trend in recent years of bringing into production more energy-efficient combined-cycle gas turbines (CCGTs). These changes, together with valuable improvements in infrastructure and, most recently, the introduction of increasing generation from wind, have resulted in an upward efficiency trend since the late 1990s. Despite these improvements and even by today's standards, generation is relatively inefficient, with significant losses occurring in converting primary energy sources, such as gas, oil or coal, into electricity. Typically, 50% to 65% of the energy of the

Figure 10: Efficiency of electricity supply 1990–2010



input fuel is lost. A further 7.5% to 8% is lost through transformers, overhead lines and underground cables in the electricity transmission and distribution networks. Reducing these losses is a priority of this Action Plan and is an important part of the new Energy Efficiency Directive.

The energy supply sector is continuously evolving, taking into account changes in demand, market characteristics and other supply-side considerations such as the availability of primary fuels. The effect of these changes has been a gradual improvement in the efficiency of electricity generation, which is highlighted in Figure 10 on the previous page.

Following an extended period of over a decade from the late 1980s during which there was limited investment in grid infrastructure, improvements in supply-side efficiency took place. This was driven by shifts from old peat and coal-fired generation plant, with an efficiency of around 30% to 35%, to modern peat plant with an efficiency of around 40%, combined-cycle plant with an efficiency of around 50% to 55%, and increased wind penetration (100%). Other technology and operational improvements, such as reduced losses in transformers, motors and generators, have also contributed, as have reinforcements of the transmission and distribution networks.²⁸ The reduced efficiency evident in 2010 was due to a lower than average wind year, leading to an increased proportion of generation from CCGT in lieu of wind generation.

The current generation capacity mix in Ireland comprises some 30% new, efficient CCGT generation capacity; 37% condensing steam cycle (mostly older plant); 10% open-cycle gas turbine

peaking plant; 7% dispatchable hydro, and almost 13% wind. Over the next seven years, 1,300 MW of older plant will potentially be replaced by about 850 MW of efficient CCGT and increased wind capacity.

There is still considerable scope for increasing efficiency further in the generation, transmission and distribution of electricity. The All-Island Grid studies, Grid 25 and the Facilitation of Renewables studies are important strategic documents that identify the range of opportunities for improved energy efficiency, such as the deployment of new technologies, reinforcement of grid, replacing assets, increased use of local generation and the introduction of improved load-management regimes. Continued implementation of efficient market incentives is a priority over the lifetime of this Action Plan.

In order for the energy supply sector efficiencies to be delivered, all market participants will need to work together, with the Commission for Energy Regulation (CER) having a prominent role in ensuring the sector is constantly challenging itself to reduce unnecessary energy usage. Likewise, the introduction of voluntary agreements by energy suppliers will place an increased emphasis on energy suppliers valuing energy services and not just energy sales.

Actions promoting efficiency of energy supply and use for heat and transport are covered in the other sectoral chapters and by Action 27 below.

ONGOING NEEAP 1 ACTIONS

Since the publication of NEEAP 1, a number of key developments in the energy sector have taken place in the following areas.

All-Island Energy Market

- 25. We are promoting competition and choice and continuing to developing the All-Island Energy Market Development Framework across a range of energy priorities, building on the establishment in 2007 of the Single Electricity Market, leading to a more efficient supply sector.**

The key factor in influencing correct investment decisions is that prices at which energy is bought and sold should appropriately reflect long and short-term costs. The All-Island Energy Market Development Framework has the overall aim of providing a more competitive energy market of better scale, improved security of supply and reduced energy costs in the interest of consumers both North and South. Launching the Single Electricity Market (SEM) in November 2007 was a major step. The SEM is the wholesale electricity market operating in Ireland and Northern Ireland.

The SEM provides for a competitive, sustainable and reliable wholesale market in electricity, aimed at delivering long-term economic and social benefits that are mutually advantageous to Northern Ireland and Ireland. The market encompasses approximately 2.5 million electricity consumers – 2.2 million in Ireland and 0.3 million in Northern Ireland.

The Single Electricity Market Operator (SEMO) facilitates the continuous operation and administration of the SEM. The SEM will underpin capital investment decisions affecting generation, import and export of electricity, and through that

investment in transmission and distribution, leading to a more efficient supply sector.

We are working with Northern Ireland to progress common arrangements for gas as another strategic goal of the All-Island Energy Market Development Framework which would constitute an important step towards achieving improved security of supply and reduced energy costs in gas provision.

Winter Peak Demand Reduction Scheme

- 26. We are providing incentives to encourage large energy users to reduce peak energy use.**

The Winter Peak Demand Reduction Scheme (WPDRS) was introduced in winter 2003/04 as an incentive to encourage medium and large electricity customers to reduce electricity consumption during the power system's peak hours (5pm–7pm) in the winter months (November–March). Many industrial and commercial customers have taken advantage of the scheme.

Participants are rewarded for demand and consumption reductions via payments based on pre-approved demand reduction and peak consumption reduction rates. Customers who reduce their demand and consumption according to the levels they commit to are rewarded. Customers who significantly deviate from these levels do not receive payments, or receive a lower payment. Payments are made to participants by their respective supplier.

The scheme has delivered approximately 100 MW of demand reduction in the years since it was set up, the equivalent of at least two existing low-merit peaking units. In light of the publication of the Demand Side Vision for 2020 in 2011, which

²⁸ For example, upgrading the 10 kV distribution system to 20 kV has made a significant contribution to reducing distribution losses.

envisaged the development of more market-based demand-side management (DSM) schemes, the CER published a consultation paper on plans to phase out the WPDRS scheme by 2013, subject to the development of viable SEM market-based demand-side schemes.

Electricity Distribution Losses

27. We will reduce electricity distribution losses to 7.5% in 2010.

As part of the Distribution System Operator's (DSO) revenue control covering the period 2006 to 2010,²⁹ incentives were placed on the DSO to reduce its network losses. Network losses are measured by the Distribution Loss Adjustment Factor (DLAF) value, which was reduced from 8.2% to 7.5%. The electricity distribution loss target was achieved for the 2006–2010 period.

Energy Savings Targets

28. We are working towards the introduction of Energy Savings Targets for energy suppliers.

The Better Energy programme was launched in May 2011 on foot of two consultation exercises on the design of energy savings targets for energy suppliers. A target of 2,000 GWh was set for the three-year period from 2011–2013. Energy suppliers are expected to deliver 1,000 GWh of this target.

The Better Energy programme operates on the basis of voluntary agreements between qualifying energy suppliers operating in the electricity, gas, solid fuels and oil sectors. Primary legislation has been introduced in the form of the Energy (Miscellaneous Provisions) Act, 2012 to further underpin the

operation of the energy savings targets.

Central to the delivery of the energy savings targets will be the continuation of the cooperative approach between the energy suppliers and Government. This process will be supported by a governance structure that allows for open and substantive discussion on the operation of the programme. The programme will be reviewed at the end of 2013 with a view to introducing a new three-year energy savings targets cycle.

Investment in New Generation Plant

29. We will prioritise energy efficiency in investment decisions for new-generation plant.

In the next few years, 1,300 MW of older plant will potentially be replaced by efficient CCGT and increased wind capacity.³⁰ Installing the more efficient CCGT plant typically increases electricity production efficiencies from 30–35% to 50–55%. This shift towards more efficient gas-fired plant could also reduce the primary energy conversion factor applied to electricity production.

The construction of modern power plant, and the ever-increasing contribution from renewable electricity sources will continue the trend towards more efficient, less carbon-intensive power generation up to 2020. It is foreseen that gas will constitute about 45% of the fuel mix for electricity generation by 2020, with oil being phased out as a primary fuel type. Development of clean coal technology for use with carbon capture and storage (CCS) will be monitored for application in Ireland in the medium to long term.

30. We will continue to investigate the scope for reducing energy transmission and operational losses.

Transmission losses are dealt with on an all-island basis and charged out to generators appropriately in proportion to their allocated transmission loss factor. This encourages generators to locate in areas where the available network is well developed and there is local demand for generation. However, as larger amounts of wind come on to the electricity system, locational decisions (by investors) tend to be based on wind resource rather than the characteristics or strength of the local transmission network. The System Operator is also required to consider losses when deciding on which plant should be dispatched in which order (the policy of the SEM is least-cost dispatch). This is a challenge for the System Operators in planning and operating the system and attempting to optimise losses.

The SEM Committee is currently engaged in a review of locational signals on the all-island transmission system. The treatment of the Transmission Loss Adjustment Factor applied to generators is one of the key aspects of this review. It is also important that any efforts to reduce losses are cost-effective. Transmission losses are currently at about 2% of total generation and it may involve considerable cost to reduce losses. In considering any investment in this area, the SEM Committee will first determine if there is a quantifiable benefit to customers that outweighs the cost of developing the solution.

EirGrid has a set of strategic challenges over the next decade in terms of all-island security of supply, sustainability and competitiveness, including the implementation of the Grid25 Strategy,³¹

interconnection and taking on the role of the transmission asset owner as well as operator.

Bord Gáis Networks has implemented an energy efficiency strategy, with dedicated resources, which will be responsible for the development and implementation of ongoing efficiency improvement in overall network system operations. This strategy is also intended to maintain present efficiencies in the gas supply system as well as developing more efficient technology for future installations.

Electricity Micro-Generation Programme

31. We will implement a wide-ranging programme to fully investigate the opportunities and long-term policy options for the micro-generation of electricity via small-scale technologies.

Micro-generation can provide a sustainable, reliable and affordable alternative to the traditional methods of power generation. In 2008, Government made available some €2 million to fund a pilot grant scheme to investigate the potential for on-site generation of electricity for own use.

Under this scheme, electricity was generated via small-scale technologies, such as wind turbines and solar power, with the potential to sell excess power back to suppliers. Grant support to meet 40% of the initial start-up costs was made available for the installation of micro-generation systems in approximately 50 trials to be conducted nationwide. Much of the programme comprised studies on technical, economic and market issues. Some examples of the technologies are solar photovoltaic (PV), wind and micro-hydro (water turbine).

²⁹ CER/05/138 CER Decision Paper on Distribution System Operator Revenues

³⁰ Source: The Generation Adequacy Report 2008-2014 (Eirgrid, 2007)

³¹ Source: Grid 25: A Strategy for the Development of Ireland's Electricity Grid for a Sustainable Energy Future (Eirgrid, 2008)

The programme followed a change in regulations in 2007 allowing people to sell electricity back to the grid, which it was hoped would empower electricity users to take action. In 2009 this was followed by the announcement (by the then public electricity supplier) of a regulated public electricity supply tariff for domestic micro-generation exports to the network and a supplementary payment for micro-generator exports to be provided by ESB Networks.

In further support of this measure, an 'inform and fit' connection policy was introduced by ESB Networks to facilitate easy connection to the grid, and planning exemptions have been introduced by the DECLG for certain categories of small-scale generation from low-carbon sources.

This action (31) aims to enable our farms and householders to generate electricity for themselves and be paid for the excess they don't use. The facility to export by micro-generators will also be facilitated in the rollout of smart metering.

Demand-Side Management

32. We will significantly expand our demand-side management initiatives.

We have a range of programmes already in operation that are designed to reduce electricity peak loading, bringing with them reduced losses in generation, transmission and distribution. These include Nightsaver in the domestic market and Winter Peak Demand Reduction, Powersave and Winter Demand Reduction Incentive in the industrial, commercial and public sectors.

We consider that greater priority needs to be given to sustained, cost-effective DSM initiatives for the residential and business sectors, building on existing programmes and informed by Demand Side Management in Ireland: Evaluating the

Energy Efficiency Opportunities, a study published by SEAI in 2008. The SEM Demand Side Vision for 2020 decision paper set out a number of priorities in relation to demand-side management. Developments in other key areas such as smart metering may accelerate the deployment of some of the associated recommendations. The CER (and Utility Regulator) will conduct an annual review of the implementation of the demand-side measures as outlined in the Demand Side Vision decision paper. The SEM Committee will publish a report against these deliverables.

Support for Combined Heat and Power (CHP)

33. We will achieve at least 800 MWe of CHP by 2020.

Combined heat and power (CHP) is the simultaneous generation of power (electricity) and usable heat in a single process, at the point of use. CHP uses the heat from electricity generation that would otherwise be wasted. This process leads to a reduction in overall primary energy usage of 20% to 40% compared with use of the electricity generated at power stations, together with heat produced separately by on-site boilers. CHP can result in savings of up to 50% of CO₂ emissions compared with conventional sources of heat and power. Existing capacity of operational CHP is 284 MWe.

The CHP Deployment Programme was run by the SEAI between 2006 and 2010, with a total expenditure of €7.5m; 95% of the capital assistance was spent on the deployment of small-scale (<1 MWe), fossil-fired CHP and biomass (anaerobic digestion and wood residue) CHP systems, with the remainder of the grants reserved for feasibility studies. The programme resulted in installed capacity of 15.6 MWe, 24.43 MWth.

Development of Smart Grid

34. We are examining the convergence of communications and electricity generation and distribution networks in order to develop a smart grid.

We are examining the convergence of communications and electricity generation and distribution networks in order to develop a smart grid that can increase overall electricity network efficiency and incorporate a high input of renewable energy.

A smart grid is one that can automatically control energy demand by signalling connected equipment to power down at times when increased demand might cause the system to exceed its optimum efficiency. This can improve continuous matching of supply to demand and allow seamless integration of intermittent renewable energy sources into a power grid.

Smart grids can also facilitate the introduction of variable pricing tariffs, to incentivise users to use energy only at times when it is more available (e.g. cheaper energy offered at off-peak times when there are high winds). Smart grids reduce the need to store energy generated by renewable sources.

NEW ACTIONS

Smart Grid Development

35. We will work collaboratively to maximise the full potential of Smart Grid deployment in Ireland.

The development of smart grids has gained considerable traction in recent years. EirGrid has a central role in the development of smart grids in Ireland. A smart grid can help to manage increased operational complexity and integrate consumer behaviour while enhancing power system reliability and increasing network efficiencies. For the smart grid to develop, Ireland must engender an environment that allows innovation and enterprise to flourish while taking account of the needs of the power system. A number of state agencies, authorities and utilities have been cooperating in recent years to enable the deployment of smart grids in Ireland.

The advanced technologies at the heart of the smart grid will bring about a number of benefits for electricity consumers, suppliers and network operators, and form a vital element in any future strategy designed to increase flexibility on the demand side and increase control over new forms of renewable generation.

In the next few years, EirGrid will seek further opportunities to exploit the benefits of new technologies, including additional demand-side participation and increased renewable generation, and work with all relevant stakeholders in order to maximise the full potential of smart grids.

Transmission, Distribution and Operational Efficiencies

36. We will reduce electricity distribution losses to 7.1% by 2014.

The Distribution Loss Adjustment Factor for 2012 is 7.3%. The Distribution System Operator revenue control covering the period 2011 to 2015 includes an incentive mechanism to reduce this value to 7.1% by 2014.

Upgrade of Electricity Distribution Network

37. We will continue to invest in the electricity distribution network in order to reduce losses.

In addition to the direct incentives to reduce losses, the CER has approved capital investment in the electricity distribution network. This investment, in particular the upgrade of 10 kV lines to 20 kV, has led to reduced losses on the distribution network and should lead to further reductions over the 2011 to 2015 period.

Promoting Competition

38. We will continue to promote competition in the wholesale and retail energy markets.

The SEM, which is a gross mandatory pool,³² is a market that offers participants significant transparency in prices and scheduling as well as a liquid spot market. At its inception, given the dominant market shares of ESB and Viridian, the regulatory authorities put in place a package of measures to prevent abuse of market power and to

encourage competition in the wholesale market. In August 2010 the regulatory authorities published an information paper, SEM Market Power & Liquidity: State of the Nation Review, and then commissioned a study by Cambridge Economic Policy Associates (CEPA) to assess how competition can be promoted in the SEM. The implementation of new measures to promote and enhance contract liquidity outlined in the CEPA report is under consideration.

With the full deregulation of the retail market (April 2011) the CER is continuing to promote competition through the active participation of consumers in the market. In April 2011, the CER published a decision paper on Customer Protection in the Deregulated Market (CER 11/057), which set out a number of decisions to protect consumers and promote competition. These decisions included the following requirements:

- Increase customer education activities to further inform domestic customers of deregulation and the competitive market and to promote active switching.
- Implement a framework for the accreditation of price comparison services.
- Review the industry switching process documentation and identify if there is a need for further clarity in any areas.
- Require sales personnel calling to homes to provide a doorstep checklist to customers.
- Require suppliers to provide 12-month rolling consumption figures on the back of customers' bills.

These measures promote competition by making customers more aware of their consumption, and arming them with the information they need to make informed choices about their supplier.

REFIT

39. We will introduce a renewable energy feed-in tariff scheme (REFIT) to support new renewable generation of electricity in 2012.

A renewable energy feed-in tariff scheme (REFIT) to support new renewable generation of electricity was opened in early 2012.

The scheme is designed to support a range of technologies, including CHP using biomass and anaerobic digestion, and to incentivise the addition of 310 MW of renewable electricity capacity to the Irish grid. Of this, up to 150 MW will be high-efficiency CHP, using both anaerobic digestion and the thermochemical conversion of solid biomass.

³² The gross mandatory pool is a market into which all electricity generated on or imported onto the island of Ireland must be sold, and from which all wholesale electricity for consumption on or export from the island of Ireland must be purchased.

Chapter 05

Transport Sector

2020 Vision

Ireland will continue to progress towards a more sustainable and energy-efficient transport sector, in particular through promoting improved technology and actively supporting changes in travel behaviour.

Achieving the Vision

- We will invest in public transport infrastructure to enable a reduction in the number of car journeys.
- We will ensure that future housing and enterprise development takes place alongside appropriate development of transport infrastructure.
- We will promote alternative forms of transport, including the use of electric vehicles.
- We will promote continued uptake of the most energy-efficient technologies and fuels.

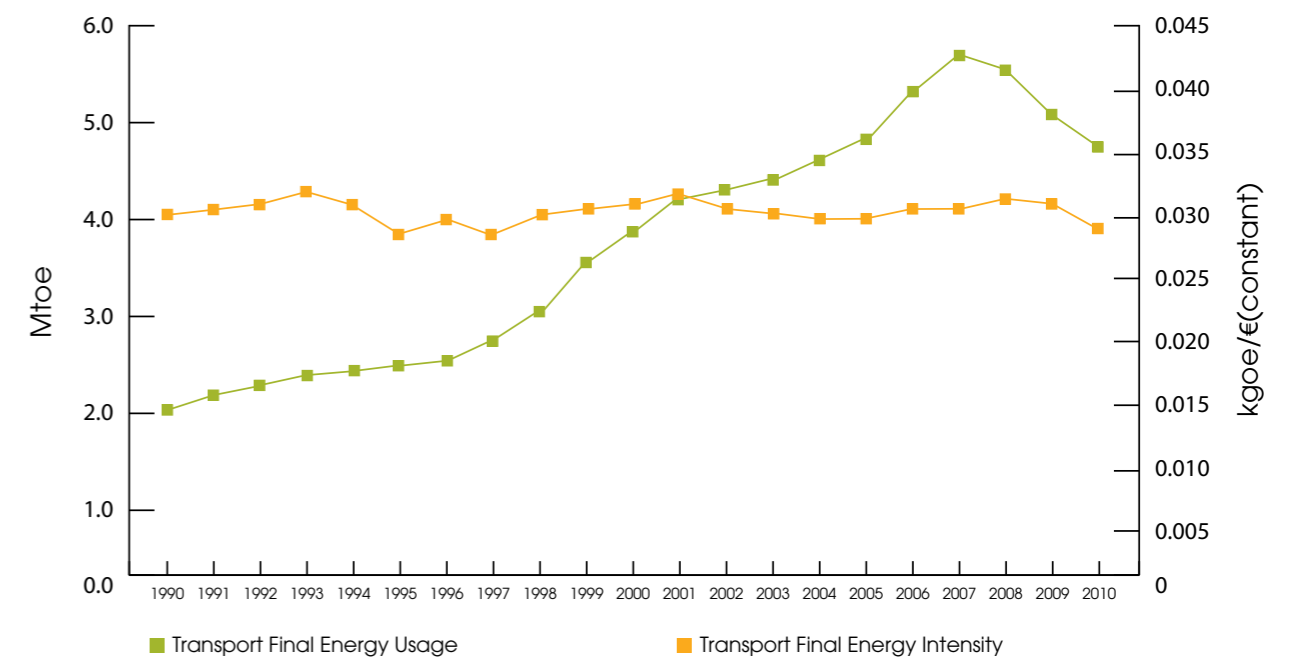
- We will continue to support and promote changes to travel behaviour that will yield a more sustainable transport system.

Energy Usage in Transport

Energy usage in the transport sector amounted to over 54,350 GWh, or 4,674ktoe (final energy consumption) in 2010. This represents a reduction on 2007 levels of 17.8%, based primarily on reduced economic activity and associated energy demand for transport. Energy usage in the transport sector grew by 132% between 1990 and 2010. As can be seen in Figure 11 below, the rapid historical growth rate for transport energy demand reversed at the beginning of the recession in 2007.

A contributing factor to the reduced demand in the sector is reduced road freight associated with building and construction, as well as a reduction in private car use. Energy intensity remained relatively constant over the period. While there has been

Figure 11: Energy usage in transport



an increase in efficiency of vehicle use, this has been far outweighed by the increasing number of vehicles, historic changes in engine sizes and volumes of freight carried (until recently). Moreover, policy measures such as the rebalancing of motor taxation have led to reduced fuel usage since 2008. Alongside the decline in energy demand in the transport sector due to economic contraction, progress has been made on a wide range of policy measures (outlined in further detail in this chapter).

Introduction

The transport sector measures in NEEAP 1 were developed in the context of the Smarter Travel Policy (the Government's Sustainable Transport Policy for Ireland, which covers the period from 2009 to 2020), published in February 2009. The Smarter Travel Policy remains the framework under which energy savings and emissions reductions will be achieved in the transport sector. It contains five key goals:

- to reduce overall travel demand.
- to maximise the efficiency of the transport network.
- to reduce reliance on fossil fuels.
- to reduce transport emissions.
- to improve accessibility to transport.

There are 49 specific actions in the policy aimed at achieving these five key goals. The 49 actions can be grouped into four broad categories of action: (i) actions aimed at reducing travel demand and distances travelled, (ii) actions aimed at ensuring modal shift, (iii) actions aimed at improving efficiency through technology implementation, and (iv) actions aimed at strengthening institutional arrangements to deliver the policy. The vision and actions set out in the Smarter Travel Policy closely

reflect the sustainable transport aspects of the recent European Commission White Paper on Transport.

ONGOING NEEAP 1 ACTIONS

Since the publication of NEEAP 1, a number of key developments in the transport sector have taken place in the following areas.

Energy-Efficient Vehicles

40. We will continue to incentivise the purchase of more energy-efficient vehicles.

NEEAP 1 outlined the rebalancing of Vehicle Registration Tax (VRT) and motor taxation to incentivise the purchase of more energy-efficient cars. Over the period 2000-2007 there was an unsustainable trend of vehicle technology improvements being offset by the purchase of larger cars. As a result, the energy efficiency of the national fleet remained static over the period.

The aim of rebalancing VRT and motor taxation rates, which came into effect from 1 July 2008, was specifically to incentivise the purchase of lower-emission/more energy-efficient cars. Under this new system, both VRT and motor tax are payable based on seven bands (A-G). Prior to the change in taxation rates, the average vehicle purchased had vehicle emissions in the region of 164 g/km. This had fluctuated around a level of 165-168 g/km since 2000, until the rebalancing in July 2008. For 2009, the first full year for which figures are available, the average emissions of a new vehicle entering the national fleet reduced to around 144 g/km. This fell further to around 133 g/km in 2010. The net result is that the average car entering the national fleet is now approximately 20% more energy-efficient than was the case prior to rebalancing of vehicle taxation.

This incentivisation is working to ensure that the EU-driven technology improvements are affecting the composition of the national car fleet much more quickly than would a taxation system that does not operate on the basis of emissions/energy efficiency. The net effect is to speed up the lowering of emissions in the national fleet, compared to EU measures alone, and offer substantial fuel savings over the lifetime of each vehicle. It is estimated that savings of 373 GWh were made in 2010 due to the step change in purchasing patterns and resultant changes in the fleet structure.

A public consultation was launched in December 2011 regarding the revision of the current system of VRT and motor tax to adjust CO₂ bands and rates in line with technological advances in motor vehicles. The net saving from the EU technology measures and the taxation rebalancing combined is estimated at 2,400 GWh and 3,670 GWh in 2016 and 2020 respectively.

Electric Vehicles

41. We will continue to support the deployment of electric vehicles in Ireland.

Electric vehicles were identified in NEEAP 1 as an important aspect of improved energy efficiency in the transport sector, and since 2009 good progress has been made in ensuring that electric vehicles will form an integral part of the national fleet in coming years.

A grant support scheme, which is administered by the Sustainable Energy Authority of Ireland, began in April 2011 and will run for two years in order to assist the purchase of new battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). Grants of up to €5,000 are available towards the purchase of a BEV and €2,500 towards a PHEV. These grants will be in addition to the VRT

exemptions of up to €5,000 (for BEVs) and VRT reliefs (for PHEVs) which apply to the purchase of new EVs. A total of €1.5 million was allocated in 2012 for this purpose. Ireland aims to have 10% of vehicles powered or partially powered by electricity from the grid by 2020.

In addition, the Government and ESB agreed a memorandum of understanding with a number of car manufacturers to ensure supply of electric vehicles into the Irish market. The ESB is supporting the deployment of electric vehicles by rolling out, subject to the uptake of electric vehicles during the pilot scheme period, 1,500 publicly accessible charge points for EVs. These will be located in every city and town with a population of more than 1,500. A total of 2,000 domestic charge points will also be installed. As well as the above, 30 fast chargers will be built 60 km apart along all major interurban routes.

42. We are enabling more fuel efficiency, interurban freight and private car movements through improved road infrastructure.

The major road infrastructural improvements identified in NEEAP 1 have been delivered through the completion of Major Interurban Routes (MIRs). This programme was completed in December 2010. Where the infrastructure resulted in the removal of traffic bottlenecks from small towns and villages not designed for interurban traffic, there has been a reduction in unnecessary fuel consumption by both cars and freight vehicles. When allied to measures designed to promote efficiency in the traffic fleet and driver behaviour, these infrastructural improvements will continue to contribute energy efficiencies into the future.

43. We are maintaining the fuel efficiency of older private cars through vehicle testing.

The National Car Test system continues to assist in maintaining the fuel efficiency of older private cars. Over 860,000 private cars were tested in 2009 and a further 890,000 in 2010. All cars in Ireland are subject to periodic testing on reaching the fourth anniversary of their first registration and every two years thereafter. From 1 June 2011, annual testing of cars over 10 years old was introduced. In addition to the National Car Test system, commercial vehicles (buses and goods vehicles) undergo annual testing for roadworthiness, which includes inspection of the engine and fuel system. This commercial vehicle testing applies annually to over 200,000 vehicles.

44. We are continuing to promote the benefits of eco-driving.

Since the publication of NEEAP 1, we have made progress on promoting eco-driving. The Sustainable Energy Authority of Ireland has championed eco-driving over many years, including recognising in the 2011–2015 Strategic Plan the need for driver training and fleet management. Furthermore, the Road Safety Authority (RSA), which has responsibility for driver testing, is addressing the issue of eco-driving in two ways. First, under the Learner Driver Training (LDT) programme, the RSA is including driving skills and behaviours that support an eco-driving approach as part of the syllabus and associated mandatory lessons. The syllabus incorporates a section on driving in an eco-efficient manner (LDT Syllabus reference 2.9, pages 52–53), and includes: (i) Using primary controls in an environmentally friendly manner, (ii) Planning trips in an eco-efficient manner, (iii) Maintaining constant speed when possible and using gears and engine in an eco-friendly manner. Secondly, as part of a review of the driving test, the RSA is looking at its approach to assessment of faults to measure the

degree to which and how fault marks are applied to various driving behaviours to ensure that any aspect of driving consistent with eco-driving is (a) encouraged and (b) not penalised by being marked as a fault. While this is consistent with the approach to marking the driving test as currently adopted, it became a defined part of the driving test from spring 2012.

During the period of NEEAP 2, the broad area of driver behaviour will continue to be studied and progressed in the context of its ability to contribute to reduced fuel consumption and transport emissions, while continuing to facilitate the economically efficient movement of people and goods.

45. We will continue to assess the potential for demand management measures.

Demand management was identified in NEEAP 1 in the context of longer-term plans, and in particular linked to the availability of high-quality public transport alternatives. The broad area continues to be studied; the National Roads Authority (NRA) published a National Roads Traffic Management Study in February 2011. The study is an in-depth analysis of potential traffic management measures: (i) control measures, (ii) demand management and (iii) fiscal measures including tolling. Consideration of traffic management issues will continue in the context of public transport investment plans, and the need to ensure optimum use of land transport infrastructure.

An interdepartmental working group on intelligent transport systems (ITS) is developing a national intelligent transport systems and services action plan in accordance with the Smarter Travel proposals and statutory obligations arising from the ITS Directive (2010/40/EU). The ITS Action Plan will seek to realise efficiencies in (i) road freight

transport, through improved travel information, fleet management and logistics, (ii) public transport, through fleet vehicle location technology, passenger information systems and integrated ticketing, and (iii) road transport, through traffic management and incident management technologies on busy sections of the road network.

46. We will continue to promote mobility management plans in schools, workplaces and at home.

The Department of Transport, Tourism and Sport (DTTS) in cooperation with the National Transport Authority (NTA), continues to support An Taisce's Green-Schools Travel programme, which is now reaching some 650 schools with 153,000 pupils nationwide. It is expected that the number of schools participating in the Green-Schools travel module will increase from around 650 in 2010 to over 1,100 in 2012. The results from this programme are impressive, showing a 27% shift from private car use to more sustainable modes of travel to school. It is estimated that this programme resulted in energy savings of around 7 GWh in 2010.

In June 2010 the DTTS launched an initiative with the NTA to deliver workplace travel plans in Ireland's biggest 100 employers by the end of 2012. Currently some 72 of the largest workplaces, hospitals and universities are engaged in the Smarter Travel Workplaces programme led by the NTA. Initial results show a 16% decrease in single occupancy car use and it is estimated that this scheme resulted in energy savings of around 10 GWh in 2010.

A pilot exercise in personalised travel planning has taken place in Adamstown, led by South Dublin County Council, and a further pilot study has recently progressed in Midleton, County Cork. Following consideration of the impacts of these pilots, and subject to available resources, further

progress in this area will be considered over the period of NEEAP 2.

47. We will continue to promote National Cycle Policy Initiatives.

In addition to the above mobility management issues, NEEAP 1 noted the potential for modal shift to cycling to reduce emissions and energy consumption in the transport sector. Since publication of the National Cycle Policy Framework in April 2009, the Department of Transport, Tourism and Sport has allocated more than €22 million to a range of projects based on improving cycling infrastructure and promoting a modal shift to cycling. A similar level of investment in cycling is planned for the coming years. This funding has mainly been on pilot or demonstration-type projects, and it is hoped that the national census of April 2011 will allow some measurement of the impact of these projects on modal shift in the geographic areas targeted by the projects. A Cycle to Work scheme was introduced in 2009. The scheme exempts expenditure (up to a total value of €1,000) on the purchase of a bicycle (and safety equipment) that will be used for travel to work, from income tax on the benefit in kind arising.

The National Transport Authority (NTA) undertook work on a comprehensive design manual for the provision of cycle routes. This Cycling Design Manual was published in 2011. It provides a framework for the design and delivery of safe, cycle-friendly facilities that will facilitate increased cycle usage throughout Ireland.

Case Study: *dublinbikes* Strategic Planning Framework 2011–2016

Dublin City Council in partnership with JCDecaux launched the *dublinbikes* scheme on 13 September 2009. The scheme provides a fully integrated transport alternative that is an innovative system, allowing subscribers access to bicycles from automated self-service stations.

The *dublinbikes* strategic planning framework sets out an ambitious vision for the future expansion of this unique form of public transport. Sustainability is at the heart of the five-year planning framework as the City Council aims to develop an environmentally friendly means of public transport.

There are currently 550 bikes and 44 bike-stations across the city, and *dublinbikes* is one of the most successful bike share rental schemes in the world. The bikes have been used for over 3.17 million journeys, with 66,000 subscribers.

In 2010, the City Council adopted a long-term strategy for the scheme, with the ultimate aim of 5,000 bikes and approximately 300 more stations planned across the city. The first phase of the *dublinbikes* expansion got under way in summer 2012, with 1,000 new bicycles expected by early 2013.

48. We are encouraging use of public transport through Tax saver commuter tickets.

The Tax saver public transport commuter scheme, as outlined in NEEAP 1 continues to operate successfully, with over 3,500 companies now purchasing monthly, part-yearly or annual tickets for their employees. Employees can save between 31% and 52% in tax and social insurance charges compared to normal ticket purchasing.

NEW ACTIONS

49. We will realise energy efficiencies through the operation of the Ireland-UK Functional Airspace Block.

The first NEEAP noted that the Ireland-UK Functional Airspace Block (FAB), established in mid-2008, was the first FAB to be established in Europe. Quantifiable benefits in terms of costs and environmental impacts are already being delivered. The FAB report for 2009 (the first full operational year) was published in June 2010. Among the achievements highlighted were fuel savings and emissions reductions associated with two projects, the En Route Shannon Upper Airspace Redesign project (ENSURE) and the Night Time Fuel Saving Routes project (NTFSR). The former project delivered savings of 14,800 tonnes of fuel, and the latter savings of 5,700 tonnes of fuel. This is the equivalent of 253 GWh of energy savings in 2009. This saving will occur on an annual basis, and could increase depending on the number of services in place, and future evolution of the schemes.

50. We will use spatial planning policies to reduce unnecessary commuting.

The Planning and Development (Amendment) Act 2010 and the National Spatial Strategy remain the cornerstone of planning policy in Ireland, providing a framework for the sustainable development of our communities. The Act was introduced to support economic renewal and continue the promotion of sustainable development by ensuring that the planning system supports targeted investment in infrastructure by the State and by further modernising land zoning.

The Department of Transport, Tourism and Sport together with the Department of Environment, Community & Local Government is sponsoring the preparation of an urban street design manual.

The overriding aim of this manual is to set out design guidance and standards for both new and existing urban roads and streets in Ireland, incorporating good planning and design practice and encouraging more sustainable travel patterns in urban areas. Publication of a revised manual is expected in 2013.

Furthermore, the Department of Transport, Tourism and Sport has provided financial support to a number of local authority pilot projects which involve retrofitting of infrastructure to assist in increasing walking and cycling modal share.

Carbon Tax

51. We have introduced a carbon tax on petrol and diesel, which sends a strong pricing signal to road users.

Budget 2010 saw the introduction of a carbon tax of €15 per tonne. This was increased by €5 to €20 per tonne in Budget 2012. The carbon tax is about sending price signals to incentivise a change in behaviour in both companies and households to reduce their carbon emissions.

The energy efficiency impact of the carbon tax is difficult to extrapolate given the complex interaction between vehicle purchasing patterns set against a background of increasing (and fluctuating) oil prices. However, it is clear that a carbon tax will have a long-term impact on fuel efficiency. Research on the issue suggests that fuel prices are an important aspect in long-term fuel demand, with estimated long-run elasticities as high as 0.7, and short-run elasticities in the region of 0.3.³³ Using a conservative estimate of the long-term elasticity value being 0.15 indicates that applying

a carbon tax of €15/tonne could result in energy savings within the transport sector of 318 GWh in 2016, and 331 GWh in 2020.³⁴

The level and timeframe of any changes in the excise area, including the carbon tax rate, will be determined in the context of the annual Budget cycle.

52. We will ensure that Regulation 1222/2009 on the labelling of tyres is implemented in full.

Regulation 1222/2009 on the labelling of tyres, which came into force on 1 November 2012, introduces fuel efficiency labels for all new tyres from that date. The new label follows the A to G classification system of existing energy labels, so the best-performing tyres will be awarded an 'A'. In addition to its impact on fuel use, the label will provide information about the product's performance in wet conditions and rolling noise in decibels.

While the regulation has direct effect, we will ensure that it is fully implemented through appropriate market surveillance.

53. We will continue to improve the energy efficiency of rail services.

A range of energy efficiency actions have been implemented in recent years in the area of rail transport. New rolling stock continued to enter the fleet, and these latest-generation diesel engines result in efficiency savings relative to the engines that they replace. An automatic engine shutdown system has also been put in place for all diesel multiple units in the fleet. Furthermore, train sizes are now matched to demand, leading to further efficiencies. It is estimated that the combined

³³ Thomas Sterner (2007). Fuel Taxes: An important instrument for climate policy. Energy Policy 35 (2007) 3194-3202.

³⁴ These estimates will be incorporated in a broader analysis of the impact of the carbon tax in the next NEEAP.

impact of these measures is resulting in energy savings of approximately 26 GWh per annum.

Energy savings on electric traction services have been achieved through the implementation of 'regenerative braking systems', whereby vehicles are braked using the electric motors to generate power for use by other vehicles. Matching train sizes to demand is also taking place for electric traction services. The savings from these measures are in the region of 8 GWh per annum.

There is potential for fuel additives to improve the performance of diesel reciprocating engines. This will be investigated over the period of NEEAP 2; equipment to monitor engine performance in this regard will be fitted to four commuter diesel multiple units (DMUs) for testing. Furthermore, building on the savings achieved through automatic shutdown and restart for DMUs, it is planned to implement similar measures for the auxiliary engines in DMUs, and for locomotives, subject to satisfactory test results. It is estimated that these measures could offer additional savings of up to 37 GWh per annum.

54. We will continue our programme of improving the energy efficiency of bus services.

Since 2009 a range of programmes aimed at improving energy efficiency have taken place in Dublin Bus. Reduced congestion on routes, brought about by improved bus priority on the network, has lowered fuel consumption. In addition, a number of technical measures, including a reduction of idle engine speeds and the use of economy programmes in engine and gearbox management, have resulted in fuel savings. It is estimated that the combined effect of reduced route congestion and technical measures in 2010 was an energy saving of 24 GWh.

Dublin Bus is implementing the Network Direct programme, which aims to redesign the route

network to respond to demand and better meet the needs of existing and potential customers. The service redesign has already resulted in improved fuel efficiencies due to reduced bus mileages, estimated at 32 GWh in 2010.

The Dublin Bus Network Redesign project is currently in progress. It is expected that the resultant annual savings will increase from 32 GWh in 2010 to 44 GWh in 2012. It is planned to introduce an eco-driving initiative, which will provide drivers with real-time feedback and assist with changing driver behaviour. This eco-driving initiative in Dublin Bus is expected to yield savings in the region of 3 GWh in 2012, rising to 15 GWh by 2016. In addition, fleet replacement – at an estimated rate of 1/12 of the fleet per annum will – yield savings as it is expected that new vehicles will be approximately 10% more efficient than the vehicles they replace.

55. We are introducing integrated ticketing in public transport.

Modal shift towards public transport will continue to be supported through the provision of improved passenger information and integrated ticketing. Integrated ticketing has been rolled out to cover services provided by private bus operators, Irish Rail (DART and commuter rail) and Bus Éireann (Eastern region). This is complemented by the provision of real time passenger information across the public transport network is also at an advanced stage of delivery within the Greater Dublin Area.

56. We are introducing programmes to improve driver behaviour through speed enforcement.

The GoSafe programme, launched in November 2010, provides 6,000 enforcement hours and 1,475 survey hours per month across the road network. While the main purpose of the cameras is a reduction in accidents, injuries and fatalities, the increased enforcement is also expected to result

in a reduction in excessive speeds on the road network.

While it is too early to carry out in-depth analysis of the impact of enhanced speed enforcement, it is expected that this measure will yield quantifiable savings in the order of 490 GWh and 510 GWh in 2016 and 2020 respectively. In addition to the direct data from the enforcement and survey hours, an annual 'free speeds' survey is carried out by the Road Safety Authority (RSA), which will provide a good basis for calculating future savings.

Chapter 06

Business Sector – Industrial & Commercial

2020 Vision

Irish business will be known internationally for embracing energy-efficient practices, innovation and competitiveness.

Achieving the Vision

- We are continuing to provide procurement guidance and tax incentives to encourage companies to buy the most efficient equipment.
- SEAI will offer networking, training and advisory services to all businesses seeking to reduce energy usage.
- The largest energy users are undertaking best international practice in pursuit of EN 16001, the European Energy Management Standard.
- We will seek to maximise the business and market development opportunities for Ireland through the International Energy Management Standard ISO 50001.
- The Better Energy Workplaces scheme aims to implement a wide range of qualifying sustainable energy upgrading projects in the public, commercial, industrial and community sectors.

Introduction

Ireland's support programmes for energy efficiency in the business sector are focused on providing a sustained suite of services that guide and assist business efforts to continuously improve efficiency and competitiveness, through structured energy management systems and stimulation of innovation. Building on the cumulative multiannual progress to date, substantial further energy efficiency potential is being targeted over the course of this Action Plan.

Energy Use in Industry

Energy use in the industrial sector amounted to 24,344 GWh (final energy consumption) in 2010, a reduction of around 23% on 2007 levels – largely as a result of the economic downturn. Energy usage grew by 21.7% in the industrial sector between 1990 and 2010, as illustrated in Figure 12 on the next page. This growth masks the nature of structural change in the economy, as trends towards higher value-added products, such as pharmaceuticals and electronics, influence the energy intensity of the industrial sector. Over the same period the level of energy intensity of industry overall fell by 66%, reflecting these structural changes together with improvements in energy efficiency over time.



Figure 12: Energy usage in industry

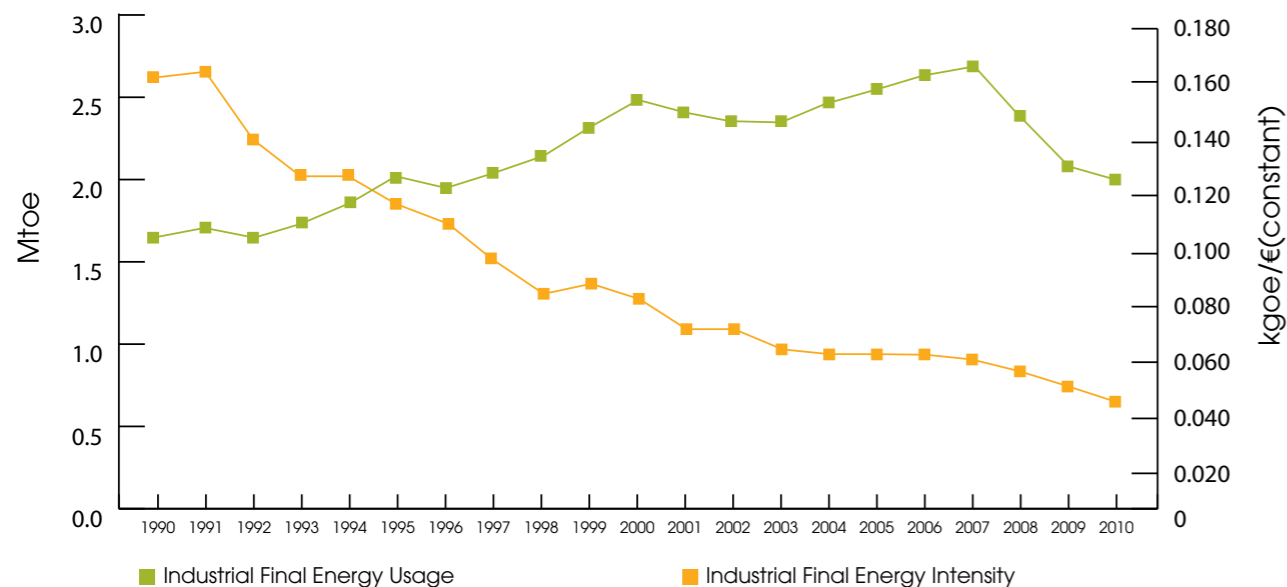
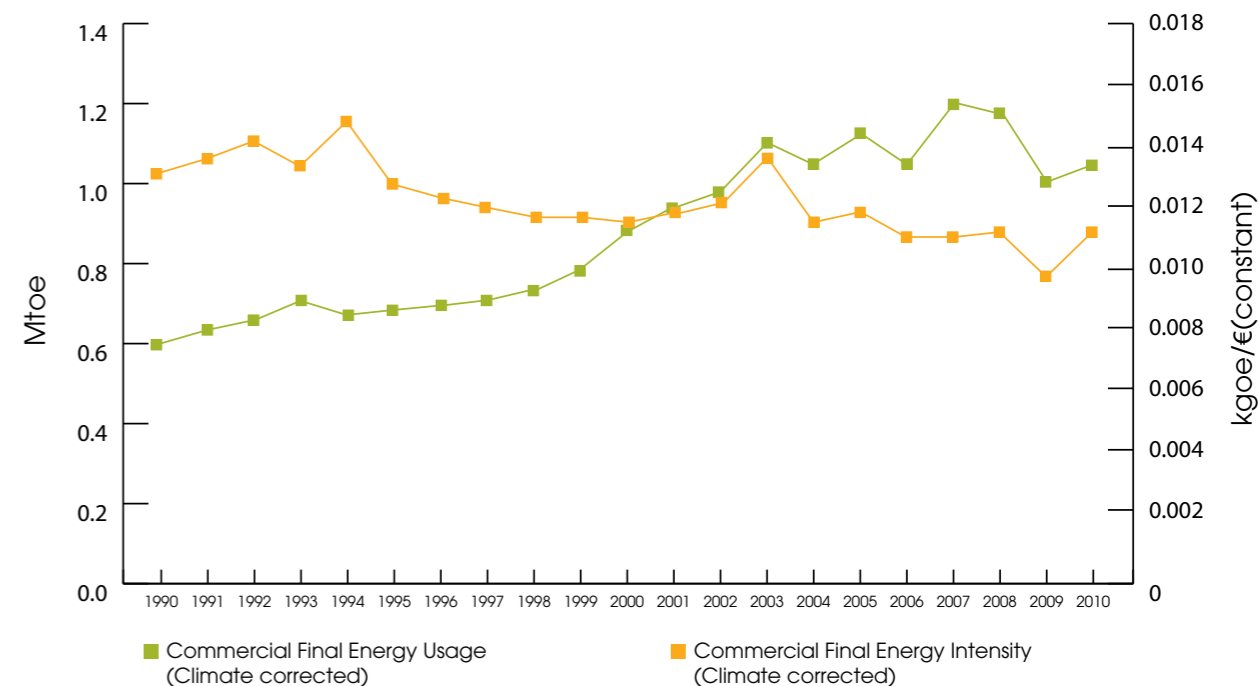


Figure 13: Energy usage in the commercial sector



Energy Usage in the Commercial Services Sector

Best available data for the public and commercial sectors is derived from services-sector data, based on an estimated ratio of commercial and public-sector energy use in the services (tertiary) sector. As with public-sector data, services-sector data is provided in the Energy Balance (produced by the SEAI's EPSSU annually) as a residual, following definition of the final energy use in the industrial, residential and transport sectors. On this basis, energy usage in the commercial sector is estimated to have amounted to 12,703 GWh (final energy consumption) in 2010. As illustrated in Figure 13 on the next page, substantial growth in energy use is estimated in the sector between 1990 and 2010 (97%).

Electricity usage increased significantly over this period, possibly reflecting the changing structure of the sector and the general increase in the use of ICTs and air-conditioning. The energy intensity (measured as energy usage per unit of added value in the sector) decreased by an estimated 20%, reflecting both improvements in energy efficiency overall and increasing added value for a given energy input.

ONGOING NEEAP 1 ACTIONS

Accelerated Capital Allowances (ACA) Scheme

57. We are providing tax incentives to encourage companies to buy the most energy-efficient equipment.

Most organisations lack the internal capacity to identify, evaluate and select the most energy-efficient products available for particular end-use applications. The operation of the Accelerated Capital Allowances (ACA) scheme provides independent intelligence to energy end users regarding the products that are best in class from an energy efficiency perspective, as well as offering a financial incentive to organisations to procure such products.

Section 46 of the Finance Act 2008 introduced the ACA scheme for specific classes of energy equipment for an initial three-year period, which was extended for a further three years in Budget 2011. There are now 52 technologies covered in 10 product categories, comprising over 8,000 products registered. The ACA enables businesses to write off the entire cost of such equipment in the year of purchase. The increased number of ACA categories will generate added opportunities for investment in energy-efficient equipment across all major technology sectors and will create further potential for companies to achieve far-reaching energy savings.

Indicative figures from the Revenue Commissioners show that in 2009 (the first full year of operation of the scheme) 83 companies claimed for capital allowances of €13.4 million at an estimated tax forgone of €1.6m through the scheme. The

provisional figures for 2010 show that €4.5 million was invested in ACA equipment, resulting in a total tax forgone of €0.6 million.

A database of exemplar energy-efficient products, the Triple E product register, has evolved out of the ACA specified list. Moreover, the Energy Efficiency Public Procurement Regulations 2011³⁵ state that all public procurement shall reference this database when procuring new equipment or vehicles.

Large Industry Energy Network (LIEN)

58. We are supporting the networking and exchange of best energy efficiency practice by the largest industrial energy users through the Large Industry Energy Network (LIEN).

The Large Industry Energy Network (LIEN) is a well-established networking and information programme for large industrial energy users, operated by SEAI. In operation for 16 years, it now engages some 160 of the largest energy users in ongoing relationships, including site visits, workshops and annual performance reporting. LIEN members share information on energy-saving technologies and techniques to maximise savings and maintain competitiveness. Annual energy expenditure across the LIEN is approximately €900 million and accounts for around 60% of industrial energy usage, representing 15% of national primary energy usage.

Within the network, the Energy Agreements Programme, introduced in 2006, supports a voluntary commitment by large industry to a structured multiannual approach to energy management. This is given practical effect by the adoption and application of a recognised energy management standard (originally I.S. 393, currently EN 16001 and now transitioning to ISO 50001) verified

by independent audit. It carries formal targets and action obligations. Special investigations supported by the programme have led to the identification and extraction of deeper energy savings opportunities across a number of technologies and services.

Of the 160 member companies of LIEN, the Energy Agreements membership has grown to 90, and is projected to expand to over 100 companies in 2011. Since the inception of LIEN, cumulative weighted energy performance across participating companies has improved by almost 40%. The Energy Agreements programme has given a new impetus to the collective and cumulative achievement, reflected in a doubling of the cumulative energy savings over the period 2006–9.

These achievements have led to Ireland being recognised as a leader in energy management systems. The Irish Energy Management Standard (I.S. 393) was influential in setting the basis of the European and international standards.

Small and Medium Enterprises (SME)

59. We are assisting the SME sector with a targeted scheme providing assessments of energy use and advice on energy management.

A dedicated support programme has also been operated by SEAI since 2008 for small to medium energy users. This offers free energy management advice, mentoring, training and other support services to any business willing to show a commitment to becoming more energy-efficient. This service delivery includes provision of initial energy audit and offers a structured approach to energy management, in a form that can be adapted and tailored to the level of energy costs in the company.

Over 2,000 businesses, representing an annual energy expenditure of over €400 million, have already availed of this programme, with 10% energy savings routinely found in the first year and energy cost savings of up to 30% achieved in many cases.

ICT and Energy Efficiency

60. We will continue to demonstrate the significant potential available through ICT efficiencies, working closely with the industry, using technological solutions such as virtualisation, co-location, efficient IT hardware, optimised cooling technologies, and energy management controls.

The information and communications technology (ICT) sector in Ireland is a thriving and growing industry, with nine of the top 10 global ICT companies having a strong presence in Ireland. The economic contribution of the sector is substantial; the ICT industry is currently responsible for over 25% of Ireland's total turnover. The sector employs more than 74,000 people. In 2010, 3,500 new jobs were announced in the sector, on foot of a net employment growth rate of 6% in 2009.

The Sustainable Energy Authority of Ireland (SEAI) is facilitating an ICT group, bringing together principal stakeholders and leaders in energy efficiency to develop methods to improve energy efficiency. Membership includes local authorities, national and international experts on data centres, green IT and cooling, key stakeholders in public-sector IT, and the SEAI. The group aims to develop best-practice guidelines, training guidelines for stakeholders and a summary report of policy recommendations.

The Green Grid is a global consortium of companies, government agencies and educational institutions dedicated to advancing resource efficiency in data centres and business computing ecosystems. In February 2011 it was announced that the power use efficiency (PUE) metric developed by this organisation will be used by a number of data-centre operators in the US, Japan and Europe. The PUE metric determines the amount of energy used by a data-centre facility and its IT equipment. PUE has become the globally accepted method for data-centre operators to measure and improve their data-centre infrastructure energy efficiency.

With €11 million in research funding across 48 projects from 2004–2010, ICT is an area of varied research, covering the application of ICT to buildings and process design, energy management and the use of energy in ICT itself. This research is being carried out by a variety of our outstanding third-level institutions, and includes the use of ICT for building design and management, the design and optimisation of ICT equipment and data centres, and the application of computer simulation to energy problems.

³⁵ European Union (Energy Efficiency Public Procurement) Regulations 2011 (S.I. No. 151 of 2011)

Table 5: Summary of business sector savings achieved (2010) and expected (2016, 2020)

	Energy savings (GWh PEE)			CO ₂ savings (kt)		
	2010	2016	2020	2010	2016	2020
SEAI Large Industry Programmes	1,595	2,235	2,730	398	539	642
SEAI SME Programme	150	400	505	36	91	113
ACA (private sector)	55	370	690	13	80	140
SEEEP and EERF (private sector)	175	175	175	42	41	40
CHP (private sector)	280	370	430	68	90	104
ReHeat (private sector)	250	290	290	61	70	70
Better Energy (commercial sector)	0	500	1,000	0	114	223
Total	2,505	4,340	5,820	620	1,025	1,330

The business sector offers considerable opportunities for realising substantial energy efficiencies. The following actions are those that offer the most potential over the life of this Action Plan.

NEW ACTIONS

Green Enterprise Guide

- 61. We will work with State enterprise and business promotion agencies and industry representative bodies to promote the benefits to business of greater energy efficiency.³⁶**

A number of agencies (IDA Ireland, Enterprise Ireland, SEAI and the Environmental Protection Agency) published in July 2011 *Developing a Green Enterprise*, a cost-saving guide for businesses and facility managers on environmental support services and grant-aid offerings in Ireland.

³⁶ Green Enterprise Guide: <http://www.epa.ie/downloads/pubs/other/corporate/Developing%20a%20Green%20Enterprise%20Navigator.pdf>

The purpose of the guide is to provide information on where a business or institution can go for assistance in relation to water conservation, waste prevention, energy efficiency and clean technology – depending on whether the client is a large or small enterprise, a multinational, or a public institution. The four agencies will cooperate in providing integrated eco-efficiency support services as appropriate to business or institutional needs.

Market Surveillance

- 62. We are designing a market surveillance programme intended to test products across a range of product fiches, under both the Energy Labelling and Ecodesign Directives.**

The Department of Communications, Energy and Natural Resources is responsible for all aspects of implementation of the Energy Labelling Directive and for market surveillance aspects of the Ecodesign Directive. Our overall approach to monitoring and surveillance activities will encompass both proactive and reactive inspections

allied to product testing to ensure compliance with the law.

Market surveillance of the Ecodesign Directive primarily entails having the various products falling within the scope of the Directive tested by accredited laboratories to verify their energy efficiency in various operational modes. Where testing does not support the claimed efficiency of the product, the Department is required to take enforcement action, including ordering the manufacturer to rework the product or banning the product from our market.

To fulfil our obligations under the Energy Labelling Directive, the market surveillance authority will outsource inspection functions to a suitably qualified market actor who will then be appointed as an authorised officer. Authorised officers will carry out in-store visual inspections of energy labels to verify the manufacturer's declaration and that all relevant information is properly displayed. The overall aim is to provide consumers with accurate information at the point of sale relating to the energy efficiency and consumption of a product.

There can be wide variance in the energy usage of products that perform the same basic function. Sometimes the most energy-efficient model can be more expensive to buy, but its lower energy usage over the course of its useful life more than compensates for its higher initial capital cost. The market surveillance regime will ensure compliance with the Energy-Using Products and Energy Labelling Directives, assisting in the creation of awareness and a market for energy-efficient products.

Energy Star

- 63. We will work with our European partners in implementing the new Energy Star Agreement.**

We welcome the communication from the Commission on the Energy Star Programme³⁷ and its recommendation for renewal of the agreement between the EU and the United States. Energy Star³⁸ is rightly an integral part of the Union's energy efficiency policy. The results, in relation to both penetration of Energy Star products and compliance levels, is encouraging. More particularly, the indicative energy savings assessment of the impact of Energy Star shows that, in the last three years, the programme has resulted in an estimated reduction in the electricity consumption of new office equipment sold in the EU since 2008 by about 11 TWh. This translates into some 3.7 Mt of avoided CO₂ emissions. That is a welcome outcome. We look forward to further programme benefits based on a new agreement with the US.

Better Energy Workplaces

- 64. The Better Energy Workplaces scheme will achieve significant, measurable and verifiable energy performance gains in the public and private sectors that will act as exemplars leading to replication of energy-efficient retrofit measures across these sectors.**

In May 2011, the SEAI launched the Better Energy

³⁷ Communication from the Commission on the implementation of the Energy Star programme in the European Union in the period 2006 – 2010, COM(2011) 337 final, 10 June 2011

³⁸ The programme, based on an agreement between the USA and the European Community, concerns the coordination of energy efficiency labelling programmes for office equipment. The original agreement expired in December 2011.

Workplaces programme, which is designed to assist in the energy efficiency upgrade of non-domestic buildings, facilities and services. The scheme was open for applications for projects from public-sector, private-sector and community organisations. It built on the achievements of comparable incentive schemes in 2009 and 2010 (see below).

In 2009, the SEAI delivered a €5 million programme that provided grant assistance to the business and public sectors. The programme supported energy efficiency measures for businesses and institutions across the country. Over 74 projects were funded under the programme. As a result of the work carried out, annual energy savings worth €2.6 million and 12kt CO₂ were achieved. The public sector accounted for 50 of these projects and most of the savings, with €2.2m and 9.8kt CO₂ saved.

In June 2010, the SEAI launched the €9 million Energy Efficiency Fund. The scheme was quickly oversubscribed; over 43 projects were approved. The fund supported exemplar projects that achieved significant and verifiable energy savings and provided key learnings for other businesses and public-sector bodies. The projects, 20 of which were in the public sector and 23 in the private and voluntary sectors, were completed by the end of 2010. The energy efficiency actions taken will create lifetime savings of over €70 million, and some 50,000 tonnes of CO₂ emissions will be avoided each year.

Key objectives of the Better Energy Workplaces scheme are to achieve significant, measurable and verifiable energy performance gains in the public and private sectors that will act as exemplars, leading to wider dissemination and replication of energy efficiency retrofit measures across these sectors. A fund of €11 million was disbursed in 2011 to a further 85 projects. Particular attention was given to deeper and scalable retrofit solutions that achieved significant, measurable and verifiable energy performance

gains. A total of €34 million of additional funds were leveraged, bringing the total investment to €45 million. Energy savings of over 270 GWh are estimated and 56,000 tonnes of CO₂ will be abated annually.

Subject to available future funding, we will continue to leverage investment in a range of energy efficiency measures. Since such measures are relatively labour-intensive, their delivery will also stimulate employment. A further goal of the scheme is to encourage new models of service delivery through innovative contractual, organisational and financing arrangements. This will help to establish a new value chain for delivery of sustainable energy projects, including procurement and contracting arrangements between partners, thus disseminating the principles of energy performance contracting, which in turn will inform other longer-term initiatives for activating sustainable energy retrofit investment.

Energy Performance Contracting (EPC) / Energy Service Companies (ESCOs)

65. We will develop a standardised energy performance contract process with a view to overcoming the barriers that exist for the public sector in particular.

While there are recognised barriers to the large-scale deployment of ESCO/EPC contracting, the benefits to the public sector in terms of energy savings are clear.

Constraints on the availability of investment capital, among other factors, have led to the concept of Energy Service Companies (ESCOs) offering organisations a packaged suite of energy efficiency measures under the aegis of a negotiated energy performance contract and engaging third-party financing. However, both in Ireland and elsewhere, this concept has generally been slow to gain market recognition and acceptance.

After commencing with public-sector buildings and facilities, it is planned to promote and facilitate this business model, by developing a resource toolkit, including model contracts, and by supporting exemplar projects to act as influential case studies. In the first two years of this updated plan, such projects are anticipated in local authority and prison-service facilities. By establishing a proving ground for the ESCO model of energy efficiency delivery, it is intended to promote and transfer this model to accelerate and leverage energy efficiency investment projects in both the wider public sector and in the business sector as a whole.

In particular, we will undertake the following actions:

- DCENR and SEAI will target the rollout of ESCo pilot projects in local authorities to meet our commitment in the Government's Infrastructure and Capital Investment 2012–2016: Medium Term Exchequer Framework.
- In line with the development of a Pay-As-You-Save (PAYS) model, we will look to develop an appropriate framework to drive the market in the commercial and public sector.

Large Industry Energy Network (LIEN)

66. We will extend the Large Industry Energy Network (LIEN) membership, achieve deeper energy savings and intensify participation in the international energy management standard ISO 50001.

The Large Industry Energy Network (LIEN) and Energy Agreements programmes cover the most energy-intensive segment of Ireland's industrial base. Over the lifetime of this Action Plan, these very successful programmes will continue their momentum, further extend their membership and achieve deeper energy savings.

Participation in Energy Agreements, centred on the new international energy management standard ISO 50001, will be intensified, and deeper energy efficiency opportunities will be pursued across a range of technologies (e.g. HVAC, steam, compressed air, cleaning, drying, motive power), services (thermal and electrical) and subsectors (e.g. dairy, pharmachem, ICT). This work will draw on the findings and methodologies emerging from recent and future specialist investigative working group studies targeted at these specific fields of opportunity.

The overall target set for this sector is an ambitious one, representing a continuous year-on-year annual target improvement of almost 400 GWh over the lifetime of the Action Plan.

Small and Medium Enterprises (SME) Programme

67. We will ensure that the SME sector has access to the necessary supports to reap the financial benefits from investment in appropriate energy management practices.

Over the lifetime of this Action Plan, we will strengthen our communications with the SME sector in order to ensure that businesses are fully aware of the financial benefits that can be realised from making informed investment decisions and from adopting appropriate energy management practices as an intrinsic element of business management.

Awareness and uptake of these services will be extended through online resources, improved access to advice, and upscaled training delivery systems. Such resources will include sectoral and technology guidance and case studies. Work with key business-sector stakeholder groups will continue, and the more energy-intensive sectors,

such as the hospitality sector, will be targeted in order to increase participation rates.

The one-to-one advice, mentoring and assessment element of the SEAI's SME supports is being redesigned with a view to changing to a more market-oriented model. It is planned that a panel of registered energy professionals, aligned with the provisions of S.I. 542 of 2009, will provide the service by means of a voucher-based support mechanism. It is anticipated that this new approach will facilitate easier access by SMEs to the services offered and ultimately ensure more effective delivery of these services.

Accelerated Capital Allowances (ACA) Scheme

68. We will develop the ACA products list and Triple E register to serve as the recognised reference for energy-efficient procurement.

Budget 2011 and section 35 of the Finance Act 2011 extended the ACA scheme for a further three years to December 2014, demonstrating the Government's commitment to a proven incentive for business. The extended scheme is a win-win for business and the environment. It provides a boost to companies that wish to purchase highly energy-efficient plant and machinery, and thus save on energy costs and reduce CO₂ emissions.

On the basis of increasing awareness over time and as the list of eligible technologies expands, there is an estimated potential to save up to 975 GWh by 2020 across the public and private sectors, worth over €50m (€2010). This level of energy savings would result in abatement of 200,000 tonnes of CO₂.

The Triple E register of exemplar energy-efficient products will continue to expand in scope and to serve as a recognised resource for the business

and public sectors (in the latter case through the Energy Efficiency Public Procurement Regulations 2011³⁹) when procuring new equipment or vehicles. Moreover, the performance thresholds for entry on the register will continue to be periodically reviewed and progressively upgraded.

Progress on Building Standards

69. We will develop the construction industry's capacity to achieve higher energy performance standards and to create sustainable jobs over the lifetime of this Action Plan.

Notwithstanding the severe contraction in the building sector over recent years, the following initiatives have been taken with a view to supporting the construction industry in complying with the latest Building Regulations and developing its capacity to achieve higher energy performance standards in future:

Developing Professional Design Skills: Third-level institutions are providing levels 7, 8 and 9 energy and sustainability-related courses for construction professionals. Professional bodies and continuing professional development organisations are providing additional training for existing professionals. Over 6,000 people with construction-related qualifications have completed the Domestic Energy Assessment Procedure (DEAP) training course and some 530 people with a minimum of level 7 qualification are trained to apply the Non-Domestic Energy Assessment Procedure (NEAP) methodology.

Developing Construction Trades Skills: The following training and supports are in place to facilitate the development of the required additional skills:

- FÁS (Irish National Training & Employment Authority) training schemes for air tightness and thermal bridging onsite skills.
- Integration of revised Part L guidance in apprenticeship courses in Institutes of Technology.
- Upskilling courses for trades through FÁS and the Institutes of Technology.
- Certification scheme for air-tightness testers and for certifying the energy performance of windows (Window Energy Performance Scheme), put in place by the National Standards Authority of Ireland.
- DECLG/SEAI/Homebond Acceptable Construction Details, available for use on site.
- Thermal modellers certification scheme.

With regard to building services trades, supports include:

- Upskilling courses for trades through FÁS and Institutes of Technology.
- Renewables training modules from FÁS.
- NSAI's Plumbing and Heating Code of Practice.
- Technical Guidance Document F 2010.
- Agrément certification and installer schemes for innovative and energy-efficient products.

The Department of Environment, Community and Local Government is working with industry representative groups to further enhance skills levels in this area.

Build Up Skills Ireland (BUSI)

70. We will support the Build Up Skills Ireland (BUSI) initiative in the development of a national qualification roadmap.

The residential and commercial sector accounted for over 40% of energy consumption in Ireland in 2010. The Better Energy Upgrade Programme estimates that up to one million buildings will require retrofitting by 2020. In the context of a decline in the number of people directly employed in the construction industry and given Government initiatives to stimulate job creation in this sector, it is clear that specific energy skills are required. A coordinated up-skilling programme could offer sustainable employment to many in the sector.

Build Up Skills is an EU-wide initiative focused on the continuing or further education and training of craftsmen, construction workers and systems installers in buildings. Its aim is to develop a National Qualification Roadmap for each member state, endorsed by all relevant stakeholders, that will contribute to meeting our 2020 sustainable energy targets.

To deliver this objective, DCENR, along with other government departments and agencies, will work with the Build Up Skills for Ireland (BUSI) Consortium to bring forward a comprehensive action plan and roadmap for the future training and upskilling needs of the Irish construction sector.

³⁹ European Union (Energy Efficiency Public Procurement) Regulations 2011 (S.I. No. 151 of 2011)

Chapter 07

Residential Sector

2020 Vision

All new Irish housing will be nearly zero-energy. Efficiency standards in older homes will be significantly improved through retrofitting actions.

Achieving the Vision

- Amendment of Building Regulations to improve efficiency in new homes.
- Introduction of smart meters to encourage energy-efficient behaviour by householders.
- In the domestic sector, use of a standardised measurement methodology to measure and calculate progress of energy suppliers towards their annual targets.
- Implementation of the Affordable Energy Strategy to target low-income households at risk of energy poverty.

Introduction

Ireland has been making good progress towards meeting our international commitments in terms of improving energy efficiency and reducing carbon dioxide emissions in the built environment. Building Regulations are important in setting the standard and driving performance improvements. The ongoing programme of graduated improvements in the energy efficiency requirements for dwellings under the Building Regulations will contribute to 20% of Ireland's overall emissions reductions targets for 2020.

However, it needs to be acknowledged that the level of building activity has decreased substantially in recent years. While the improved building standards will continue to have an impact, much of our focus must return to retrofitting older building stock if we are to meet our energy efficiency targets.

There are still obstacles and market failures preventing us from realising the full technical and economic potential of energy efficiency. The practical barriers to installing energy efficiency measures include the upfront cost of measures, the length of time required for measures to pay back in savings, and the 'hassle' involved in planning and carrying out work. Most of all, many people have never even thought about retrofitting their homes and aren't aware of the energy savings available to them.

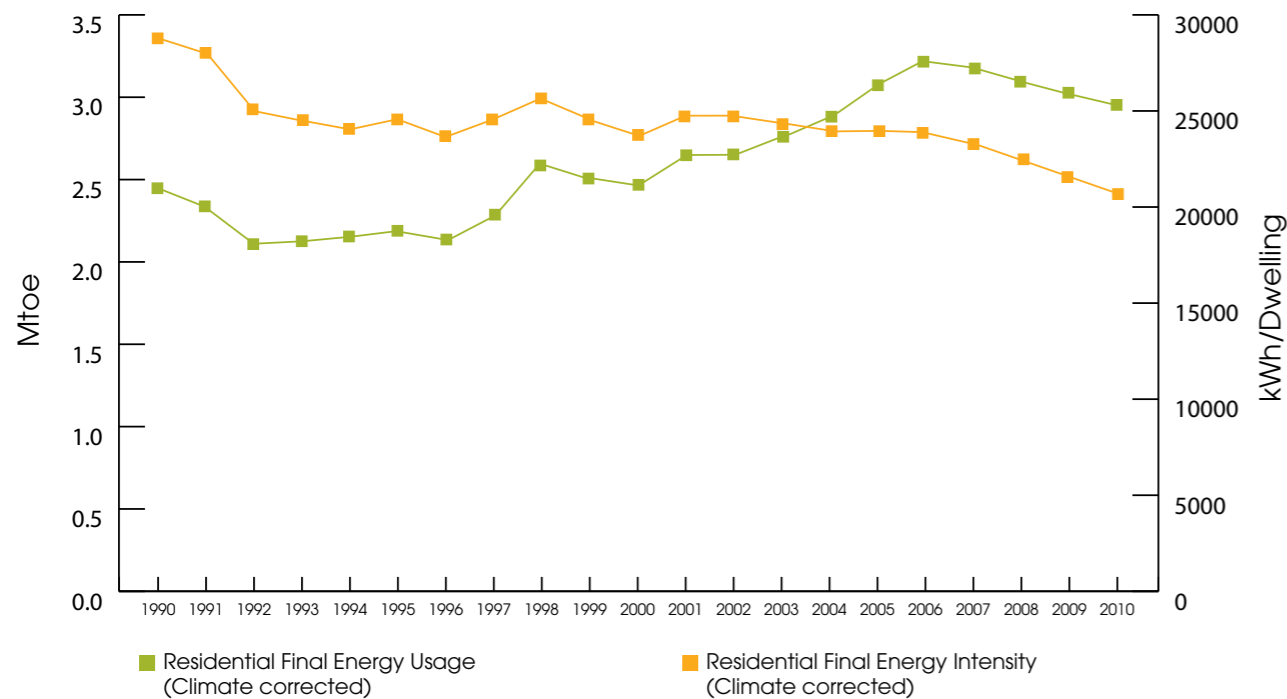
Power of One was a successful information campaign that led to noticeable changes in consumer behaviour and has paved the way by preparing the market for action through incentives. Smart metering will play an integral role in encouraging consumers to consider deeper measures in the coming years. In today's climate, we can encourage consumers more than ever to actively take up energy efficiency upgrades and to realise energy savings in their bills.

Energy Usage in the Residential Sector

Energy usage in the residential sector amounted to over 34,550 GWh (final energy consumption, climate-corrected) in 2010, a decrease of 5.7% on 2007 levels, when the impact of climate variation is taken into account. Total energy usage grew by just 21.1% in the sector over the period 1990–2010, as illustrated in Figure 14 on the next page, with the number of households increasing by over 60%. Energy intensity (average energy usage per household) decreased by over 10% over the period, reflecting an improvement in energy efficiency of the housing stock, much of it due to the higher efficiency standards of new housing. Not all the improvements in energy efficiency resulted in lower energy usage; in some cases, higher standards of heating and comfort levels followed the deployment of central heating.



Figure 14: Energy usage in the residential sector



ONGOING NEEAP1 ACTIONS

Better Energy: Homes

- 71. We are providing grant assistance to householders to upgrade the energy efficiency of older homes through Better Energy: Homes.**

Better Energy: The National Upgrade Programme was launched in May 2011. There are four strands to Better Energy, which replaced three domestic energy efficiency and renewable energy programmes: the Home Energy Savings Scheme (HES), the Warmer Homes Scheme (WHS) and the Greener Homes Scheme (GHS), together with a business support programme (formerly the Sustainable Exemplar Energy Efficiency Programme, SEEPP).

Better Energy: Homes, the domestic strand of the programme, allows customers to apply for an Exchequer-supported incentive. The measures grant-aided under this strand include roof and wall insulation, high-efficiency boilers, heating control upgrades and solar thermal. This was formerly the HES.

Between the start of the HES in 2009 up to the end of 2011, over €119 million was paid to homeowners, enabling 110,000 homes to undertake 274,000 energy efficiency measures.

Better Energy: Warmer Homes

- 72. We are upgrading the energy performance of homes occupied by those on low incomes through Better Energy: Warmer Homes.**

Better Energy: Warmer Homes is focused on alleviating energy poverty, providing support

for energy efficiency upgrades in low-income private housing, previously covered by the WHS. Applications are collected centrally, via a managing agent, or through a network of community-based organisations that deliver the retrofit work free of charge to the homeowner.

The Affordable Energy Strategy, published in November 2011, will be the framework for building on the many measures already in place to protect households at risk from the effects of energy poverty, which include the thermal efficiency-based measures delivered through the Better Energy: Warmer Homes programme.

Smart Metering

- 73. We will encourage more energy-efficient behaviour by householders through the introduction of smart meters.**

Smart meters are the next generation of meters, which can replace existing electro-mechanical and diaphragm meters and offer a range of benefits for both the individual electricity and gas consumer and for the electricity and gas systems in general. A smart meter is an electronic device that measures the consumption of energy, adding more information than a conventional meter and giving up-to-date information on usage to the consumer. A key feature of a smart meter is the ability to provide bidirectional communication between the consumer and supplier/network operator.

Smart meters can (i) facilitate improving energy efficiency by empowering consumers with more detailed, accurate, and timely information about their energy consumption and costs; (ii) reduce overall energy consumption, and (iii) reduce overall energy bills by shifting any discretionary electricity usage away from peak consumption times. The benefits of smart metering are recognised

internationally; a number of key EU legislative instruments promote smart metering to ensure that consumers are properly informed of actual energy consumption and costs frequently enough to enable them to regulate their consumption.

The CER, working closely with the Department of Communications, Energy and Natural Resources (DCENR), established the Smart Metering Programme Phase 1 in late 2007 with the objective of setting up and running smart metering trials and assessing their costs and benefits, in order to inform decisions relating to the full rollout of an optimally designed universal National Smart Metering Programme. Smart Metering Programme governance structures have been in place since early 2008, including a Smart Metering Steering Group and a Working Group, established and chaired by the CER. These groups are designed to draw on the valuable experience and expertise of the electricity and gas industries and thus consist of representatives from the DCENR, the Sustainable Energy Authority of Ireland, ESB Networks, Bord Gáis Networks and Irish gas and electricity suppliers.

Various smart metering electricity and gas trials for residential and small-to-medium (SME) business consumers were planned and designed during 2008 and began in 2009/10, for completion in 2011. Associated cost-benefit analyses for the national rollout of electricity and gas smart metering were also completed in 2011, using the findings of the various trials. The key deliverables of Phase 1 – namely, the comprehensive electricity and gas smart metering trials reports and cost-benefit analyses reports (as shown in Figure 15 on the next page) – were published by the CER in 2011.

Figure 15: Smart Metering Programme Phase 1 – key deliverables



This combined suite of electricity and gas smart metering reports provide a robust, fact-based information set that has informed the CER and stakeholders of the merits of providing smart electricity and gas meters to residential and SME consumers in Ireland. In addition, the comprehensive cost-benefit analyses helped to cast light on the relative attractiveness of various design options for the implementation of smart metering and the main sources of risk associated with a national smart metering rollout.

Based on the clearly positive findings from these comprehensive reports, the CER issued a consultation paper (CER/11/191) in November 2011 outlining its intention to proceed with a national rollout of electricity and gas smart metering in Ireland. Consultation paper CER/11/191 also outlined proposals, drawing from European and national legislative requirements, on the high-level objectives, data requirements, design, functionality, implementation approach and timelines for the national smart metering end-to-end solution. The consultation period closed in December 2011 and 35 responses were received. The CER published its final decision paper on the national smart metering rollout in July 2012. It is envisaged that this paper, by finalising the rollout decision and firming up on its high-level design and requirements, will enable

the CER to move the National Smart Metering Programme into Phase 2, where the high-level design and requirements will be elaborated on with the involvement of all relevant stakeholders under an appropriate governance structure and against a detailed implementation plan.

Smart Metering – Consumer Behaviour

Case Study: The success of a smart metering rollout and the smart grid depends on consumers responding to the information on their energy usage in a positive way. An electronic device linked to the smart meter displays almost real-time information to consumers on their electricity consumption and associated costs.

Smart meter trials are the first step towards the realisation of a smart meter in every household. From the 9,681 installations, 5,000 residential consumers and 650 businesses were used as a representative sample. The meters were installed nationwide by the end of June 2009, and electricity usage profiles were established between July and December 2009. Test measures were put in place from 1 January 2010 and ended on 31 December 2010.

Consumption data gathered during the 12-month test period was analysed to determine the consumer response to the smart metering-enabled measures tested in terms of the impact on overall and peak electricity usage. A total of 82% of participants made a change to the way they used energy. The trial proves that consumers can benefit from the deployment of time-of-use tariffs, which make it easier to adjust consumption patterns to times when energy is cheapest.

Housing Aid for Older People Scheme

74. We are providing grants to older people through the Housing Aid for Older People Scheme, including for works that will improve the energy efficiency of their homes.

The Minister for the Environment, Heritage and Local Government introduced the Housing Aid for Older People Scheme in November 2007. The scheme aims to provide targeted support to improve conditions in the housing of older people. The scheme may assist with works that can improve the energy efficiency of homes, such as insulation, provision of central heating and repair or replacement of windows and doors. The scheme is administered by local authorities, which assess applicants on the basis of household means. The maximum grant available is €10,500, which may cover up to 100% of the cost of approved works.

Condensing Boilers

75. We are ensuring a move to highly efficient condensing boilers through regulations setting a minimum efficiency standard for all new and replacement oil and gas boilers.

New regulations signed into law in May 2011 require all new and replacement oil and gas boilers to have a minimum seasonal net efficiency of 90%, with effect from 1 December 2011. The DECLG and SEAI have jointly published a Condensing Boiler Assessment Procedure as part of a guidance document on Heating and Domestic Hot Water Systems for Dwellings – Achieving Compliance with Part L. This is currently being updated to reflect the upgraded 2011 regulations.

Boiler Efficiency Campaign

76. Promote awareness of regular boiler servicing benefits.

This awareness campaign, delivered through the SEAI, seeks to encourage building owners (primarily householders) to commit to regular boiler-servicing practices and replacement of older or less efficient boilers and heating systems. The campaign prioritises boilers that need most attention (e.g. older, less efficient boilers) and includes special consumer awareness and linked trade initiatives, awards schemes and specific promotions of quality products, such as condensing boilers, efficient heating controls and renewable energy heating systems where appropriate.

Best Practice Design for Social Housing

77. We are promoting higher standards of energy efficiency in social housing.

The best-practice guidelines, Quality Housing for Sustainable Communities, published in March 2007, focus on promoting high standards in design, construction, environmental performance and durability. Sustainable development can be achieved through settlement patterns that are planned in accordance with urban design principles that create high-quality neighbourhoods, of a density that supports schools, shops and amenities within easy walking distances of dwellings.

The guidelines advocate that climate-sensitive design should take account of the orientation, topography and features of the site of a proposed development, so as to control wind effects while optimising the benefits of sunlight and solar gain. Designing for sustainability involves achieving energy efficiency at the design, manufacture and construction stages and during the lifetime of the dwellings. The guidelines set the ambition of optimising the energy performance of new homes, with the aim of reducing emissions and improving energy efficiency by 60%.

While local authorities are responsible for the overall standard and quality of their housing stock, in recognising the financial burden of improving energy efficiency, the Department of Environment, Community and Local Government has over the past number of years allocated capital funding towards upgrading the performance of social housing. 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, the installation of high-efficiency condensing boilers and other related measures. The energy efficiency

target to be achieved by these dwellings is C1 on the Building Energy Rating certificate for the dwelling, though the extent of funding is tied to the overall energy savings achieved.

Demonstration social housing schemes have been funded to achieve advanced energy efficiency standards, with energy ratings beyond that of the Building Regulations. An example of such a scheme is the Tralee Town Council – Towards Carbon Neutral project.

These programmes contribute to the reduction of fuel poverty and are an example of the public sector being a leading example in the setting of higher standards for the energy efficiency of housing.

Building Energy Rating

78. We will update the Building Energy Rating Regulations on foot of the Recast Energy Performance of Buildings Directive (EPBD).

We have rolled out a Building Energy Rating (BER) system to new houses from 2007 and extended this to existing houses from 2009. From 1 January 2009 all domestic dwellings offered for sale or lease are required have a BER. It provides information on the dwelling's energy performance and informs rental decisions. The BER certificate is accompanied by an Advisory Report that provides recommendations to enable landlords to improve the energy efficiency of their properties. Conferring a minimum standard for properties occupied by those in receipt of rental supplement would allow Government to ensure that those most in need are in a position to minimise unnecessary expenditure on energy, while driving the market to provide more cost-efficient rental accommodation.

At the end of 2011, BER certificates for over 278,000 homes were registered with SEAI, representing approximately 15% of the national dwelling stock.

Spatial and Planning Policies

79. We are encouraging more energy-efficient communities through our spatial and planning policies.

Integrated planning and sustainable community initiatives offer important benefits in terms of reduced travel requirements, integrated services and better quality of life. The National Spatial Strategy 2002–2020 is based on a sustainable development policy framework and emphasises public transport access and sustainable travel through walking, cycling and settlement patterns that reduce distances between home, work, services and leisure.

The Department of Environment, Community and Local Government's Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas set a series of high-level aims for successful, sustainable and energy-efficient residential development in urban areas and set the context for housing developers, their design teams, the planning system, and the community they serve to create high-quality places that:

- prioritise walking, cycling and public transport, and minimise the need to use cars.
- provide a good range of community and support facilities, where and when they are needed, and that are easily accessible.
- promote the efficient use of land and of energy, and minimise greenhouse-gas emissions.
- provide a mix of land uses to minimise transport demand.

- enhance and protect the green infrastructure and biodiversity.

SEAI is supporting six exemplar community projects, involving participation from across the local community, to develop and demonstrate best practice, expanding into the development of Sustainable Energy Zones (SEZ) from 2015. This programme has the potential to stimulate a national move towards sustainable energy practice, creating savings for homes and business alike, and attracting investment to our secure, sustainable and competitive economy.

NEW ACTIONS

During the lifetime of this Action Plan the focus will turn to further improving the Building Regulations, while implementing monitoring and verification mechanisms to ensure that real energy savings are being achieved.

Consolidated Building Regulations 2011

80. We have introduced new Building Regulations, delivering a 60% improvement in new-housing energy efficiency standards.

Since 1992, we have been steadily improving the energy performance requirements for housing, by greatly improving requirements (through lower u-values) for building fabric elements, including roofs, walls, floors, doors and windows. Improvements have also been made through the implementation of technologies such as solar panels, heat pumps, biomass heating systems, photovoltaic and/or micro wind technologies.

The combined effect of these changes is that the permitted primary energy usage for a typical new dwelling has decreased from 200 kWh per m² per annum in the case of a dwelling constructed

prior to the 2002 requirements to 90 kWh per m² per annum under the current 2008 regulations.

In May 2011 the Minister for Environment, Community and Local Government signed revised Building Regulations into law which will result in improved whole-dwelling energy and carbon performance, equivalent to 60% better than 2005 standards. The new requirements include substantial improvements in wall, roof and floor insulation; increased energy performance standards for windows; reduced air permeability values; more rigorous thermal bridging heat-loss calculations and specifications; higher-performing standards for oil/gas/biomass boilers, and independent time control of space heating zones. In the case of existing dwellings undergoing a material alteration, the new regulations specify improved energy efficiency levels for building elements. When fully operative, the permitted primary energy usage for a typical new dwelling constructed to the Building Regulations 2011 requirements will be 60 kWh per m² per annum.

Affordable Energy Strategy

81. We will target those in energy poverty through the implementation of the Affordable Energy Strategy.

An Inter-Departmental/Agency Group on Affordable Energy (IDGAE) has been established, which represents all key government departments, agencies and energy suppliers as well as the Energy Regulator and NGOs. The Affordable Energy Strategy has identified 48 short, medium and long-term actions that can be taken to tackle energy poverty, and five work-streams will be organised to progress issues around the role of energy suppliers, introducing an area-based approach to delivery of energy efficiency measures, data and information, and communications.

Domestic Measurement and Verification Systems

82. We will implement Measurement and Verification Systems to accurately measure energy savings achieved in the domestic sector.

Standardised measurement specifications have been published for certified energy savings measures in the domestic sectors. These will be used to calculate the progress of energy suppliers towards their annual targets. As per the Energy Performance in Buildings Directive, a Building Energy Rating (BER) will be required to be carried out on each home once energy efficiency measures are completed on the home; in addition, a calculation is to be carried out by the registered assessor carrying out the BER which will measure the improvement in rating (kWh improvement based on the square meterage of the home) resulting from the energy efficiency measures implemented. Ongoing research and analysis will be carried out to verify that actual savings achieved are in line with those estimated.

Driving Innovation in Building Standards

83. We will implement the provisions of the Recast Energy Performance of Buildings Directive (EPBD).

Directive 2010/31/EU on the Energy Performance of Buildings (Recast) was transposed by the European Union (Energy Performance of Buildings) Regulations 2012 (S.I. 243 of 2012). For dwellings, the main additional requirements to be addressed are:

- Ensuring that minimum energy efficiency requirements are set at a cost-optimal level for new dwellings and for existing dwelling undergoing major refurbishment.

- Introducing regulations to require that BER ratings be quoted in advertising and promotional material when a dwelling is offered for sale or rent.
- Developing an action plan for improving the energy efficiency of the national housing stock.

84. We will develop a framework for achieving low- or nearly zero-energy housing.

Directive 2010/31/EU on the Energy Performance of Buildings (EPBD) (Recast) requires member states to ensure that all new buildings will be nearly zero-energy buildings by 31 December 2020. The directive defines a “nearly zero-energy building” as one with a high energy performance where the low amount of energy required should to a significant extent be met from renewable sources, including onsite or nearby sources. A framework for Ireland’s approach to meeting the EPBD requirement for nearly zero-energy housing has been developed by the DECLG and will be issued for public consultation, giving a clear indication to industry of the future regulatory requirements.

85. We will encourage industry to work towards the building requirements outlined in the framework for achieving low or nearly zero-energy housing on a voluntary basis from 2013.

The graduated improvement in the Building Regulations from 2002 to date (as described above) have put Ireland at the forefront of EU member states in terms of energy efficiency standards for dwellings. Already there are signs that Irish builders and manufacturers are innovating and adapting their approaches and products to meet and even exceed the standards of the latest regulations. We are aware at a public policy level of the importance of maintaining the momentum that has been created in this regard.

Chapter 08

Cross-Sectoral Measures

2020 Vision

We will transform the use of energy in Ireland, centred around informed consumers, providing appropriate market signals and active development of business, services and technologies.

Achieving the Vision

- Comprehensive campaigns to raise awareness of energy efficiency and contribution of inefficient use of energy to climate change.
- Implementation of a range of fiscal measures to protect and enhance the environment, and examination of other measures.
- Stimulation of market actors, such as ESCOs, to deliver cost-effective energy efficiency measures to the market.

Introduction

Better Energy: The National Upgrade Programme

- 86. We will ensure that the Better Energy Programme will upgrade Ireland's building stock to high standards of energy efficiency, thereby reducing fossil-fuel use, running costs and greenhouse-gas emissions.**

The Better Energy programme has five overarching objectives, which will guide the development of the programme and inform future actions, as follows:

- Deliver energy efficiency upgrades to one million residential, public and commercial buildings by 2020, and in the process unlock significant financial savings for homeowners, businesses and the public sector.

- Realise 8,000 GWh of energy savings over the lifetime of the programme (2011–2020).
- Improve the energy affordability, health and comfort levels of vulnerable customers in society.
- Develop an innovative, competitive and sustainable market for efficiency goods and services in support of the Government's strategy for the development of a Green Economy.
- Underpin the National Climate Change Strategy through low-cost GHG emission reductions.

Better Energy: The National Upgrade Programme will build on SEAI's successful domestic grant programmes and will take the scale of activity to an unprecedented level. It will be centred on engaging market actors to deliver upgrades efficiently and effectively, with SEAI in an oversight role ensuring quality and confidence as the new markets build. The Better Energy Programme will change the way that SEAI delivers high-volume supports to energy efficiency activity in all sectors, and will bring all such work under one umbrella scheme, with a harmonised approach and a unified and easily identifiable brand, with delivery by energy suppliers. The programme will deliver on a major Government priority, with a focus on employment, efficiency and cost and emissions reduction.

The Better Energy Programme places an obligation on energy suppliers (that supply more than 75 GWh per annum) to deliver energy efficiency measures, directly or through partners, in the domestic, commercial, industrial and public sectors. Thus it will be a multiannual programme involving energy supply companies, energy services providers, construction workers, energy auditors and policymakers, working together to deliver energy savings, cost reductions and ultimately smaller carbon footprints for energy customers throughout the country through the upgrade of Ireland's building stock to high standards of energy efficiency.



Energy suppliers have entered into voluntary agreements with SEAI, under which they commit to achieving an agreed portion of the overall target, taking account of its percentage delivery of energy into the market and the markets to which it delivers. The Energy Miscellaneous Provisions Act⁴⁰ underpins the legislation already in place to allow obligations to be placed on energy suppliers.

The new programme will play a major role in achieving our national and European targets, while bridging the energy savings gap as identified in NEEAP 1. It will maximise the energy efficiency return from public and private investment, while taking account of the need to protect vulnerable households from energy poverty.

The Better Energy programme is designed to benefit all sectors of the economy, from householders to businesses and the public sector. Packages of measures will be designed to suit each sector, with the net effect of making Ireland a more competitive and environmentally friendly country.

87. We will establish a national Energy Performance Contracting (EPC) process to deliver innovative models of retrofitting and financing of energy efficiency measures in the commercial and public sectors.

This service will:

- Provide expert assistance to public bodies wishing to implement energy-saving retrofit projects using EPC and/or non-Exchequer financing.
- Develop and implement national frameworks for the implementation of this policy, e.g. through the development of standard documentation.

- Help shape a national policy with respect to the use of these models throughout the public sector over the coming decades.

In advance of the establishment of this service, SEAI will provide specialist expert advice and support to progress selected energy efficiency retrofit projects that have the potential to act as demonstrators of these innovative procurement models and for which project champion(s) have already shown strong commitment.

Energy Service Companies (ESCOs)

88. We will lead an ESCO Action Plan which will target a number of stakeholders, including relevant policymakers, market actors, potential Energy Performance Contract customers and financiers.

The plan will target the above stakeholders in the following ways:

Policy stakeholders: DCENR and SEAI along with the National Treasury Management Agency (NTMA) will prepare a business case for EPC with the objective of informing policy regarding the accounting and debit limit barriers that exist, and facilitating EPC procurement, the development of model contracts and budget ring-fencing as appropriate.

EPC Market: SEAI will work with market actors to build capacity by providing training in EPC and related concepts (e.g. monitoring and verification protocols).

Potential EPC Customers: SEAI will roll out a model to identify and support EPC pilot projects in 2012 and assist implementation by providing a coordinated suite of supports involving project facilitators, networking and access to expert legal and technical advice.

Financiers: DCENR and SEAI in partnership with NTMA will engage with financial institutions to explore different financing options, including the potential to use EU financing mechanisms, and the development of a Green Fund for EPC.

PAYS

89. We will introduce an appropriate Pay-As-You-Save (PAYS) model for Ireland to replace existing Exchequer supports for domestic and non-domestic energy efficiency upgrade measures.

The Programme for Government includes a commitment to roll out a PAYS retrofit scheme after 2013, to replace the Exchequer funding currently being provided to the Better Energy Programme.

The PAYS concept is an innovative financing mechanism that would allow consumers to finance upgrades using the money that they would have spent on their energy bill. Such a scheme can also be used to stimulate investments in energy efficiency in non-domestic buildings and premises. DCENR has established a project team to undertake the necessary technical and financial analysis of a PAYS model in the Irish context.

There are considerable complexities involved in the development of the PAYS scheme, which requires comprehensive consultation with all energy suppliers who will be involved in the scheme.

Fiscal Policy

90. We will change behaviour using the pricing mechanisms that incorporate the externalities of fuel consumption into the prices as encountered by producers and consumers in society.

This means of changing behaviour is normally recognised as the most efficient manner of providing technology-neutral incentives for new product development and helping to alter behavioural patterns regarding the use of technologies.

Budget 2010 introduced a carbon tax at a rate of €15 per tonne on fossil fuels.

In Budget 2012 the carbon tax was increased by €5 from €15 to €20 per tonne.

The carbon tax is about sending a price signal to incentivise a change in behaviour in both companies and households as regards reducing their carbon emissions. It will also encourage innovation by incentivising companies to bring low-carbon products and services to the market.

Energy Taxation Directive

91. We will actively participate in the negotiations on the revision to the Energy Taxation Directive.

The European Commission proposed a revision of the 2003 Energy Tax Directive in early 2011. The Commission proposal seeks to change the structure of the tax on energy products by introducing two components to the tax: a CO₂ component and an energy component. The introduction of a mandatory CO₂ component is not without its challenges. Moreover, there is a proposal to relate fuels of equal use that would remove the current flexibility of member states in setting excise rates.

40 Energy (Miscellaneous Provisions) Act (No. 3 of 2012)

Environmental Awareness

- 92. We will continue to raise awareness of the impact of energy usage on climate change and resource efficiency through supporting a range of educational and awareness-raising activities.**

This includes initiatives such as supporting Local Agenda 21 Partnership projects, Green Schools, Tidy Towns, promoting our climate-change resource for primary schools Eco Detectives and working with environmental NGOs, other public bodies and local authorities.

Green Schools Initiative

The Green Schools Initiative is an international environmental education programme and award scheme that promotes and acknowledges long-term, whole-school action for the environment. It introduces participants (students, teachers, parents and the wider community) to the concept of an environmental management system. It aims to increase awareness of environmental issues through classroom studies, and to transfer this knowledge into positive environmental action in the school and in the wider community. Schools that have successfully completed all elements of the programme are awarded a Green-Flag. Green Schools (Eco-Schools) is co-ordinated on an international level by the Foundation for Environmental Education (FEE).

The Department of the Environment, Community and Local Government provides financial support for the Green-Schools programme, which is operated in Ireland by An Taisce and also funded by private-sector sponsors. There is a participation rate in excess of 83% of Irish schools, and the number of schools, third-level institutions and education centres registered for the Green-Schools programme more than 3,500 in 2012.

Green Campus Initiative

Following the success of the Green-Schools programme, the Green-Campus initiative for post secondary and tertiary level educational institutions was established in 2007. The Green-Campus programme encourages a partnership approach to environmental management in third-level institutions, identifying the campus as a community and emphasising the inclusion of all sectors of the campus community in its environmental management and enhancement. The Green-Campus programme does not reward specific environmental projects or implementation of a new technology; instead it rewards long-term commitment to continuous improvement from the campus community in question.

At present 18 Irish campuses are formally registered on the programme, and three have been awarded the Green Flag.

Green Business and Green Hospitality

The Green Business and Green Hospitality initiatives, operated by the Environmental Protection Agency, support businesses in reducing their environmental impact. The Green Business initiative offers a range of supports to help small and medium enterprises to identify savings. The website www.greenbusiness.ie allows businesses to measure resource use and identify where savings might be made. They can also request a free site visit by an advisor who will come to their premises and identify environmental measures that can save money for the business.

Greening Communities

A wide range of initiatives are in place in Ireland that facilitate and recognise increasing levels of

sustainable environmental behaviour and activity. These programmes are taking place in the home, in schools, in communities and in the workplace (e.g. Tidy Towns, National Spring Clean, GreenBusiness, Green-Schools). The Greening Communities initiative, which began in 2010, seeks to coordinate and integrate these programmes to maximise their contribution to building sustainable communities. The Department of the Environment, Community and Local Government is working in conjunction with An Taisce, the EPA, NGOs, local authorities and others to develop this initiative.

Other Awareness-Raising Activities

Other initiatives to raise awareness of the impact of resource usage on climate change include the digital environmental information service (www.enfo.ie), which is to be promoted in libraries throughout the country, and the provision of school resources by the Department of the Environment, Community and Local Government and the Environmental Protection Agency. A primary-school resource – Eco Detectives – was launched in 2010 along with the secondary-school resource *2020 Vision: A Closer Look at Ireland's Environment*.

Measurement and Verification

- 93. We will ensure that energy measurement and verification systems are in place across all publicly funded programmes, as standard.**

In light of our ambitious national targets and in order to accurately record the impact of the myriad programmes and activity across all sectors, the ability to generate and analyse energy-related data is paramount.

Cross-Departmental Implementation Group

- 94. We will establish a Cross-Departmental Implementation Group to deliver the actions contained in this Action Plan.**

The group will coordinate efforts across government to maintain focus and drive the achievement of our targets. In particular it will monitor the implementation of actions to ensure delivery across the various sectors involved.

There are 97 actions identified in this Action Plan, with multiple agencies involved in their implementation. Many of these actions are already in train while further actions will be developed over the lifetime of this plan that will contribute significantly to the achievement of our savings targets. There is an onus on all to pick up the pace in the years ahead if we are to achieve what remain very ambitious national targets.

- 95. We will investigate the mechanism by which we could replicate the Australian Energy Efficiency Opportunities Programme in our large-industry supports.**
- 96. We will review the voluntary agreements for energy suppliers in the context of international best practice.**
- 97. We will fully implement the Energy Efficiency Directive.**

