

A second National Energy Efficiency Action Plan for Ireland



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FOREWORD

(Minister for Communications, Energy & Natural Resources, Pat Rabbitte T.D.)

Energy efficiency is 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 capital costs. Energy efficiency makes our economy more competitive, while lowering our GHG emissions and maximising our economic competitiveness. Energy efficiency is the foundation of a sustainable economy.

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 often productivity in the case of business.

The global context of high energy prices, turbulence in global oil markets, over dependence on fossil fuels set against the critical role of energy in our economy and impact on competitiveness makes it an ever more pressing challenge.

This second National Energy Efficiency Action Plan builds upon its predecessor in that it aims to deliver a 20% energy saving target in 2020. We have reviewed the 90 actions that were contained within the first Action Plan, updated them and identified new actions where appropriate.

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.

Better Energy: The National Upgrade Programme launched in May 2011 will play a major role in meeting our national and European targets. It is designed to maximize the energy efficiency return from public and private investment, 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 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.

EXECUTIVE SUMMARY

Improving Ireland's energy efficiency is an essential part of Ireland's energy policy, and will play a vital role in reducing our dependence on fossil fuels. The Government's energy policy is designed to steer Ireland to a new and sustainable energy future, one that helps us reduce greenhouse gas emissions and energy costs. We will seek to embed the energy efficiency principle across all of our policy actions on the basis that investments in energy efficiency 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.

Ireland fully endorses the objectives of Europe's Energy 2020 Strategy for competitive, sustainable and secure energy. As a peripheral island energy market, Ireland can benefit from a fundamental transformation of Europe's economy to a low carbon economy based around radically increased energy efficiency, accelerated deployment of renewable energy, smart networks and a well functioning, well interconnected internal energy market.

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 Union's own strategies to ensure that Europe's energy needs are met and are secure at all times.

EXTENT OF THE CHALLENGE

Ireland's total final consumption in 2010 was 12 Mtoe, a decrease of 0.9% on 2009 and 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.

In 2008 the economy entered recession, with GDP falling by 3% compared with 2007, while primary energy use grew by 1.6% and energy related CO₂ emissions grew by 1.4%. In 2009, the downturn in the economy deepened with GDP falling by 7.0% and energy and related CO₂ emissions falling by 10% and 12% respectively. With energy use falling at a faster rate than GDP and emissions falling faster than energy use, there continues to be decoupling of energy use from economic activity and emissions from energy use.

The impact of energy efficiency measures is also 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 to 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.

Reducing energy demand and consumption also works towards achieving our renewable and climate change objectives. Ireland used renewables to deliver 14.8% of electricity demand in 2010, surpassing our 2010 RES-E Directive target of 13.2%. In addition, it is worth noting that 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 Irish Government set out in the first National Energy Efficiency Action Plan (NEEAP) its plans to deliver a 20% national energy savings target (equivalent to 31,925 GWh) for the whole economy through energy efficiency by 2020ⁱ. Savings achieved to the end of 2010 account for 26% (over 8,300GWh) of this target, representing a reduction in energy spend of approximately €470 million per annum. An estimated reduction in CO₂ emissions of 2 million tonnes has also been achieved. Should all measures detailed in this plan reach their full potential by 2020 it is estimated that energy savings totalling over 34,000 GWh per annum will have been achieved, leading to a reduction in annual emissions of around 7.6 Mt. The savings identified in Table 1 below represent a potential reduction in energy spend across all sectors of approximately €2.25 billion (€₂₀₁₀) as a result:

Sector	Energy savings (GWh)		CO₂ (kt)	
	2010	2020	2010	2020
Public Sector	650	3,240	155	730
Business	2,505	5,820	620	1,330
Buildings	2,565	15,255	625	3,650
Mobility-Transport	630	5,330	160	1,360
Energy Supply	1,965	4,415	490	595
<i>Total</i>	<i>8,315</i>	<i>34,060</i>	<i>2,050</i>	<i>7,665</i>

Energy policy has shifted substantially in the years since the publication of Ireland’s first National Energy Efficiency Action Plan in 2009. 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 the 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

The Action Plan contains X actions, measures and programmes which will each play their part in securing a more sustainable energy future for Ireland. Of the X actions the following five will play an integral role the delivery of the national target:

1. **Public sector** – *The Public Sector will be a leader in energy efficiency through strong, committed action*

2. **Monitoring and Verification** - *We will ensure that energy monitoring and reporting systems are in place across all publicly-funded programmes as standard.*

3. **Implementation Group** - *A Cross-Departmental Implementation Group will be established to deliver the actions contained in this Plan.*

4. **Energy efficiency obligations** – *The Better Energy programme will deliver energy efficiency savings across a number of sectors.*

5. **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.*

Public Sector

In order to demonstrate the leading role of the public sector in driving delivery of energy efficiency improvements, and to demonstrate the significant benefits available, a specific 33% savings target is being pursued within 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 and provide further demonstration of the benefits of energy efficiency improvements to the whole economy.

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.

In the public sector, we have moved beyond what was originally laid out in the first NEEAP and are now focussed on embedding energy management practices into the culture of public sector organisation.

Measurement and Verification (M&V)

The importance of measuring and verifying the energy savings achieved is a core focus across all sectors, and is essential to defining the framework and enhancing the operation of the policies and programmes outlined. Robust M&V mechanisms ensure the appropriate policy decisions are taken. Ongoing research and analysis will be carried out to verify that savings achieved are in line with estimates made in the context of this action plan.

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.

Energy Efficiency Obligations

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. Within Better Energy, domestic customers will be able to apply for state supported incentive, through their energy supplier or other provider. Voluntary Agreements are already in place with a number of the largest energy suppliers, confirming their commitment towards making energy efficiency more affordable for their customers.

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

Pay-As-You-Save

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

KEY SECTORAL MEASURES

The following are the principal measures contained within this Action Plan, and represent the key targets for Government to achieve to meet our 2020 commitments.

Public Sector

- We will introduce obligations on all public bodies to develop and implement energy management programmes appropriate for their organisations.
- 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.
- We will establish a national advisory service for supporting innovative models of retrofitting and ideally financing energy efficiency measures in the public sector e.g. Energy Performance Contracting (EPC) and Energy Service Companies (ESCOs).
- 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 own annual reports.

Business

- 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.
- We will spearhead the development of model contracts for EPC/ESCO procurement with a view to overcoming the barriers that exist and are preventing the public sector in particular from undertaking this type of energy project.
- We will ensure the SME sector has access to the necessary supports to reap the financial benefits from investment in appropriate energy management practices.

- We will develop the ACA products list and Triple E register to serve as the recognized reference list for energy efficient procurement.
- We will develop the construction industry's capacity to achieve higher energy performance standards and in creating sustainable jobs over the lifetime of this Plan.

Residential

- We will target those in energy poverty through the implementation of the Affordable Energy Strategy.
- We will transpose and implement the provisions of the Recast Energy Performance of Buildings Directive (EPBD).
- 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.

Transport

- We will continue to incentivise the purchase of more energy efficient vehicles
- We will continue to promote mobility management plans in schools, workplaces and at home
- We have introduced a carbon tax on petrol and diesel which sends a strong pricing signal to road users
- We are introducing programmes to improve driver behaviour through speed enforcement

Energy Supply

- We will prioritise energy efficiency in investment decisions for new generation plant.
- We will work collaboratively to maximise the full potential of Smart Grid deployment in Ireland.
- We will continue to investigate the scope for reducing energy transmission and operational losses.

- We will significantly expand our demand side management initiatives.

Cross-Sectoral

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

Chapter 1: Introduction

Energy Efficiency First

Improving Ireland's energy efficiency is an essential part of Ireland's energy policy, and will play a vital role in reducing our dependence on fossil fuels. The Government's energy policy is designed to steer Ireland to a new and sustainable energy future, one that helps us reduce greenhouse gas emissions and energy costs. We will seek to embed the "energy efficiency first" principle across all of our policy actions on the basis that investments in energy efficiency 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 our first action plan, several 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 which places even greater emphasis on the role of energy efficiency to achieve our 2020 targets.

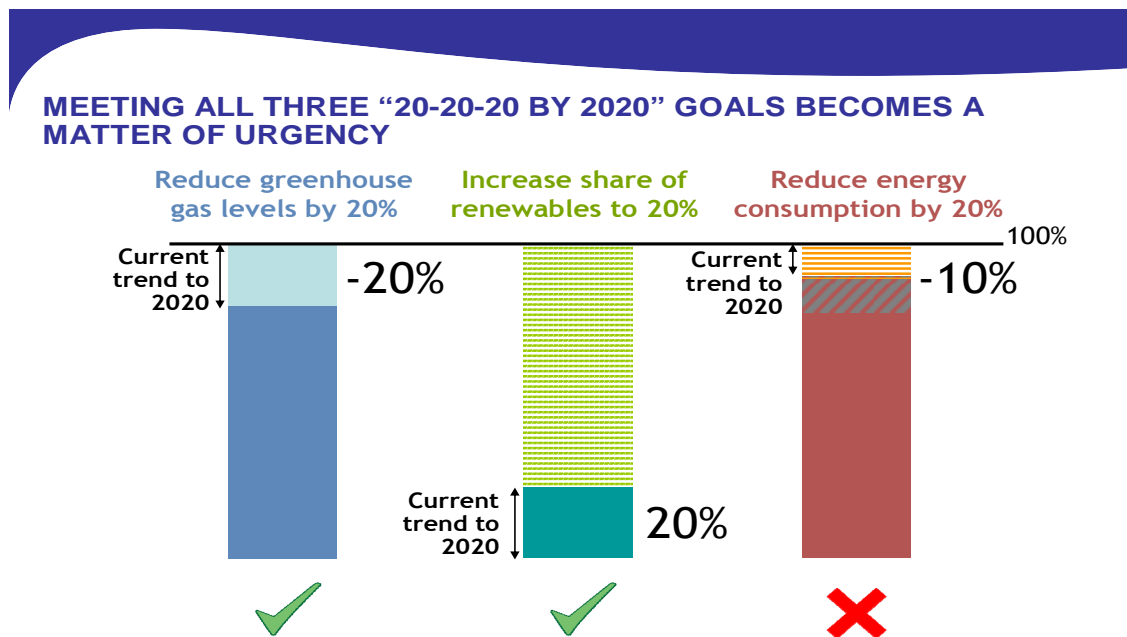
Global Energy Efficiency

In its World Energy Outlook 2011, the International Energy Agency (IEA) contained a stark warning that despite the 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 underway"*.

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. When you consider that 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, and 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 coupled with accelerated implementation will all be required if efficiency improvements are to account for 50% of 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.*

EU Policy Developments



Source: EU Commission, June 2011

Energy 2020 Strategy¹

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 on current projections and requires urgent action.

The new strategy focuses on five priorities:

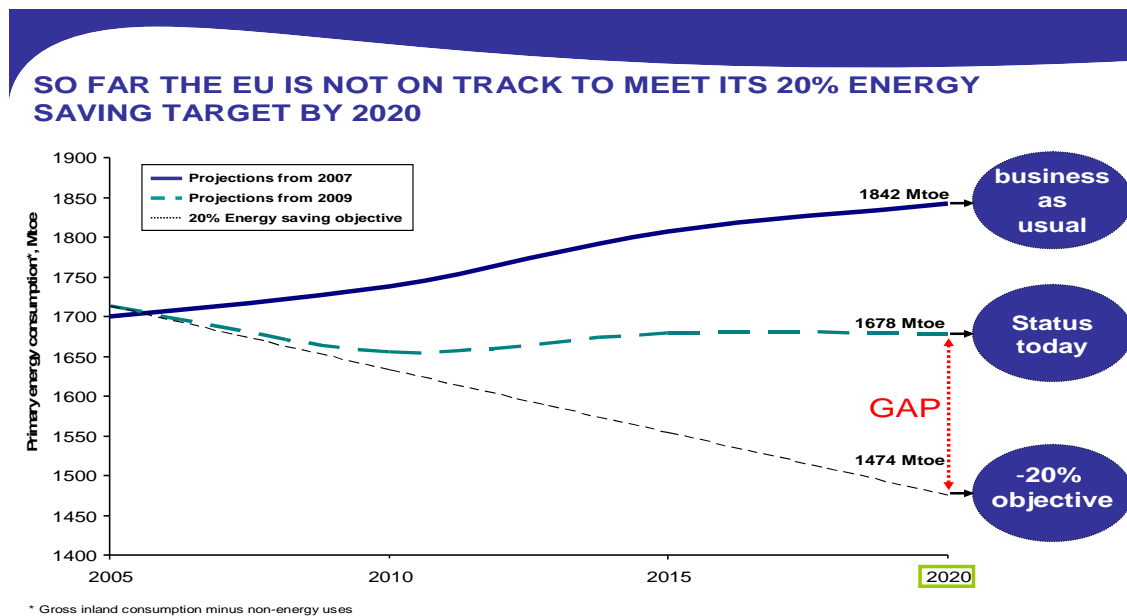
1. Achieving an energy efficient Europe
2. Building a truly pan-European integrated energy market
3. Empowering consumers
4. Extending Europe's leadership in energy technology and innovation
5. Strengthening the external dimension of the EU energy market

It is significant that energy efficiency is the number one priority and the Commission acknowledges that “*energy efficiency is the most cost effective way to reduce emissions,*

¹ Energy 2020: A strategy for competitive, sustainable and secure energy
http://ec.europa.eu/energy/strategies/2010/2020_en.htm

improve energy security and competitiveness, make energy consumption more affordable and create employment”.

Nevertheless, the Commission expresses concern on 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 renewable, we are a long way from achieving the objective set for energy efficiency”.



Source: EU Commission, June 2011

The European Council of February 2011 underlined the need to inject impetus to the Union’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”².

European Energy Efficiency Plan (EEP)³

The Commission published the Energy Efficiency Plan in March 2011 as a detailed response setting out the major policy actions to be pursued under the Flagship Initiative for a Resource Efficient Europe⁴.

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

³ 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

⁴ COM (2011) 21.

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, and also the transport sector which is the subject of a separate White Paper⁵. 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.

EU Legislative Initiatives

The **Energy Services Directive (ESD)**⁶ 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. It applies to Government, energy suppliers and final energy users. It is intended to increase the focus on cost-effective energy efficiency measures and the development of new activities in the energy services area. The ESD is set to be largely repealed under the draft proposal for an Energy Efficiency Directive published by the Commission in June 2011.

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 the ESD is on domestic and commercial buildings as these sectors account for 40% of total energy consumption and 36% of CO₂ emissions 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 Directive⁷ (EPBD) adopted in May 2010 clearly 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 proposes to calculate the energy performance of buildings on the basis of a methodology, which may be differentiated at national and regional level. Member States may set minimum requirements for the energy performance of buildings.

⁵ XX White Paper on Transport

⁶ Energy Services Directive 2006/32/EC

⁷ Directive on the Energy Performance of Buildings (Recast) 2010/31/EU

Ireland will transpose the EPBD Directive by the July 2012 deadline. A transposition plan is being prepared outlining how additional requirements included in the EPBD Recast will be addressed and will be released for public consultation later this year.

The Ecodesign Directive (2009/125/EC) was transposed by the European Union (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 which have a significant contribution to make to energy saving.

The Energy Labelling Directive (2010/30/EU) was transposed by the European Union (Energy Labelling) Regulations 2011 (S.I. No. 366 of 2011), which extends 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.

The EU Commission proposal for a Directive on energy efficiency, published on 22 June 2011 which combines aspects of Directives 2004/8/EC (Cogeneration) and 2006/32/EC (Energy Services) has wide implications for Ireland. The draft legislative instrument 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. Ireland is engaging constructively in the negotiations with the Commission, other EU Institutions and member states.

National policy

The majority of actions published in our first action plan have been significantly progressed over the last two years.

We have introduced a programme to place energy efficiency obligations on energy suppliers who provide more than 75GWh of energy per annum. Participating companies signed voluntary agreements to meet their targets in March 2012. The introduction of a carbon tax in Budget 2010 of €15 per tonne on non 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 sector. Significant opportunities and room for improvement also exists in the public sector and these aspects will form a key part of this updated strategy.

Moreover, the economic situation has also changed considerably in recent years which may impact 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 life cycle cost savings. All of these efforts will have an impact on our national energy reduction targets.

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

Public Consultation

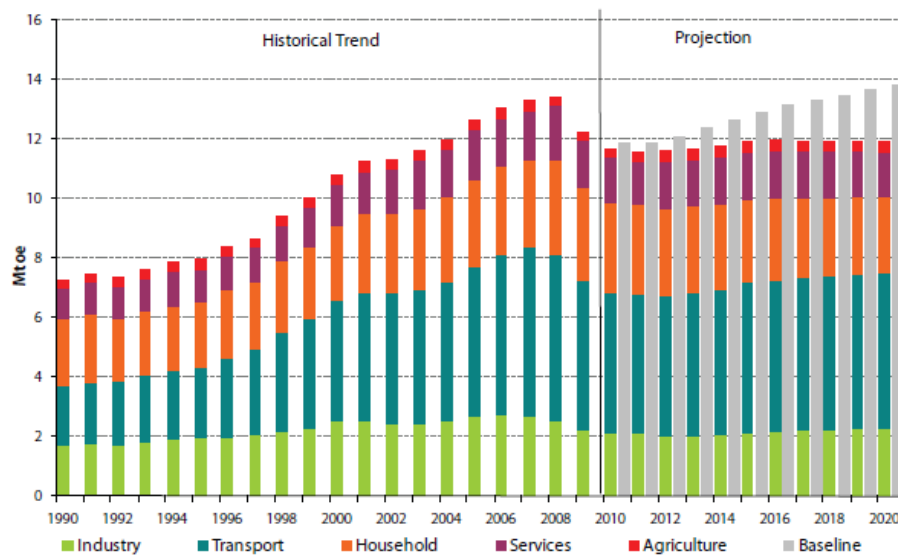
A national consultation exercise, designed to inform the preparation of the second NEEAP, was completed in February 2011. 32 responses were received from a variety of sources, although the majority came from the energy sector. As well as submissions from large energy organisations and suppliers, many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

The Action Plan was widely welcomed with many respondents underlining 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 National Retrofit Programme (launched in May 2011 as *Better Energy*), the Smart Metering Project and the ongoing need for a more efficient transport sector.

The SEAI's latest energy demand forecast⁸ illustrates the potential impact on 2020 energy demand resulting from savings from achievement of our 2020 national 20% energy savings target. Figure x below 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 plan modelled to 2020 and development of the economy over that time.

⁸ 'Energy Forecasts for Ireland to 2020', SEAI, 2011 report.

Figure x - Total final demand by sector (NEEAP/NREAP scenario)



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, namely: competitiveness, security of energy supply and environmental sustainability.

Competitiveness

It is generally accepted that the days of cheap fossil fuel sources for energy production are over.⁹ As energy costs become a more significant part of business and household expenditure, we must work to reduce the amount of energy we use to relieve this pressure.

An energy efficient economy is a more competitive one. Businesses can produce more output per unit of energy and hence more easily gain market share. Households with more disposable income available after paying energy bills are more able to participate in other markets. The energy savings achieved by the programmes and measures detailed in this plan to the end of 2010 represent a reduction in energy spend of approximately €470 million per annum. Realisation of the energy savings ambition outlined for 2020 represents approximately €2.3 billion¹⁰ 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

⁹ See for example; 'The age of cheap energy is over, IEA Executive Director warns', International Energy Agency (IEA), 21 April 2011.

¹⁰ €₂₀₁₀

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

opportunities for companies to reduce energy use through the provision of advisory services and appropriate supports.

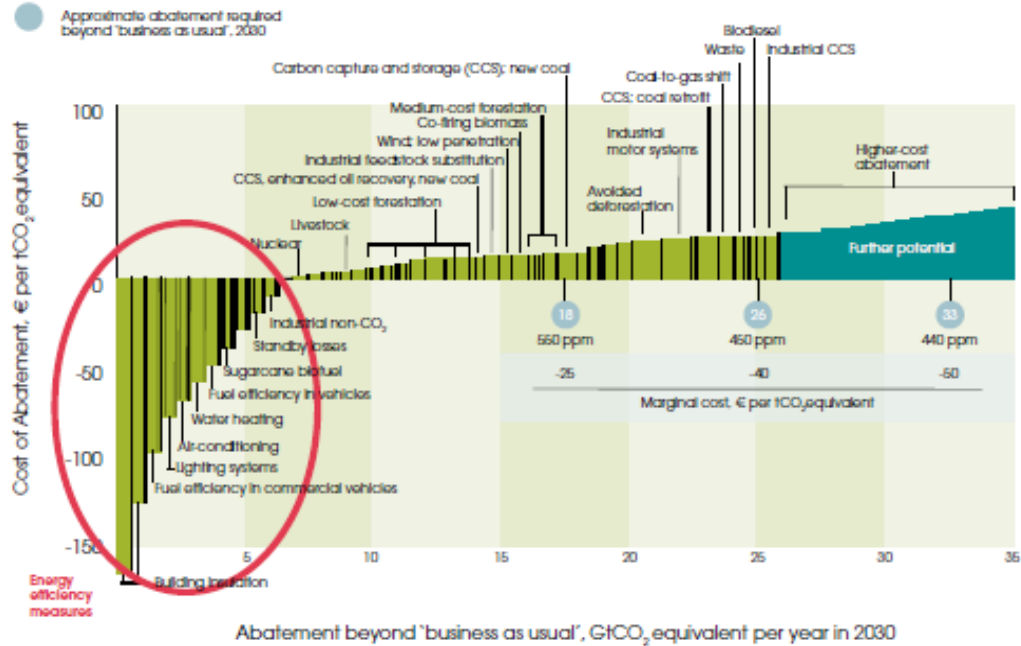
Security of Supply

In today’s world of volatile energy prices, over reliance on imported fossil fuels can leave an economy exposed to price spikes similar to those experienced in 2008. More recently we have seen energy prices increase worldwide due to political unrest in oil exporting countries. Ireland is particularly vulnerable to sudden price fluctuations as we have a heavy reliance on imported gas for electricity generation, for some energy intensive industrial processes and for heating many of our homes and businesses¹². Our transport sector is also heavily reliant on oil imports. Demand reduction through efficiency can help to reduce our reliance on fossil fuels; it represents among the cheapest way of reducing this reliance. Diversification of energy supply too, including increased penetration of renewable energy sources will benefit Ireland in this regard.

Sustainability

Savings energy results in savings of CO₂ and other greenhouse gas emissions, contributing to our national emission reduction targets. Further, it is becoming well recognised that energy efficiency represents one of the most cost effective options available to society to reduce GHG emissions. *Ireland’s Low Carbon Opportunity Study* for example highlighted significant abatement potential in Ireland available at a ‘negative cost’ to society, particularly from energy efficiency improvements.¹³

Figure x – GHG abatement potential and costs



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 Limited, July 2010.

¹³ ‘Ireland’s Low Carbon Opportunity’, SEI, 2009.

Beyond 2020: looking forward

International Energy Agency In-Depth Review of Ireland's Energy Policies

The International Energy Agency (IEA) conducted an In-Depth Review (IDR) of Irish energy policy in September 2011. While the final report is not yet published, the draft report acknowledged that considerable progress has been made in improving energy efficiency in the last decade. In particular it praised the setting of national economy-wide and public sector efficiency targets, although noting that an intelligent mix of different policies will be required, especially in the building and transport sectors, if we are to meet what remain ambitious objectives.

As the review outlines financing of energy efficiency measures poses a significant challenge in the current fiscal environment and given the Government's own commitment to transition out of state supports in the short term. Innovative financing mechanisms (e.g. an efficiency fund with private and public capital support) along with the development of a clear national framework on energy performance contracting and the development of the energy service companies (ESCO) market are critical pillars of that transition.

Furthermore one of the main weaknesses in terms of energy efficiency policy implementation is in the transport sector. While the Better Travel strategy sets out a number of measures to achieve 2050 goals, it must be fully and timely implemented. Secondly, while the introduction of a new motor taxation system, which is being reviewed, for purchasing more efficient cars is an important driver of change, an integrated plan is required for achieving the electric vehicles target of 10% by 2020.

Energy Policy Review

The Department of Communications, Energy and Natural Resources has announced that a new energy policy framework 2012 – 2030 will be developed and published later this year. The Policy framework will take account of developments since 2007 both nationally and in the European Union where energy policy has become a very central policy imperative over the last five years. The 2050 Energy Road Map will further serve to inform our strategic thinking on our national policy priorities. The new policy framework will be informed by consultation and by the outcome of the in-depth review of Ireland's energy policy undertaken by the International Energy Agency.

Energy Efficiency Directive

Following on from the Commission's adoption of its Energy Efficiency Plan in March 2011 to give fresh impetus to achieving the EU 2020 target of 20% primary energy savings by 2020, the EEP was quickly followed in June 2011 by a legislative proposal on energy efficiency, which proposes binding measures instead of binding targets.

The binding measures include:

- Setting indicative national energy efficiency targets for 2010 (article 3);

- 3% renovation target of public buildings (article 4);
- Purchasing of high energy efficiency products, services and buildings by public bodies (article 5);
- Energy efficiency obligation schemes (article 6);
- Energy audits and energy management systems (article 7);
- Metering and informative billing (article 8);
- Promotion of Combined Heat and Power (CHP) and District Heating and Cooling (DHC) (article 10);
- Efficiencies in energy transmission and distribution (article 12).

Ireland is adopting a constructive approach to the negotiations on the directive and will work with our colleagues in the Commission and with member states for the early adoption of a robust and ambitious energy efficiency framework that will keep us on track for our 2020 targets, support employment and sustainable growth.

2050 horizon

Ireland is a small peripheral energy market on the Western edge of Europe with a dispersed population and grid infrastructure and 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 bio energy and we have some of the best ocean and wind resources in Europe, which presents an excellent export opportunity in renewable energy. Moreover our experience in developing an all-island electricity market, soon to be followed in the gas market, is unique across the Union.

The principle policy drivers are moving forward with 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 changing global gas market which maintain the competitiveness pressures on the Irish economy.

SEAI has published a number of roadmaps that consider the time period 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 have been developed, with those relevant to energy efficiency including electric vehicles, the residential sector and smart grids.¹⁴

The EU has responded to the 2050 challenge and sets out the roadmap for the Union through the publication of the pathway to a low-carbon economy paper in 2011¹⁵.

In such a challenging global climate the priorities remain to secure competitively priced energy supply for business and consumers, creating the necessary conditions for a sustainable energy mix, the rollout of a cost-efficient smart energy infrastructure

¹⁴ Available at http://www.seai.ie/Publications/Statistics_Publications/Energy_Modelling_Group/

¹⁵ http://ec.europa.eu/clima/documentation/roadmap/docs/com_2011_112_en.pdf

supported by a stable energy investment framework to attain an energy efficient economy.

Chapter 2 – Energy Savings Targets: Progress and Future Ambition

National Targets

The Government set out in the first National Energy Efficiency Action Plan (NEEAP) (May, 2009) how Ireland would deliver a 20% national energy savings target (equivalent to 31,925 GWh) by 2020.¹⁶ The 20% reflects a wider EU ambition as part of the Climate Change Package of measures, often referred to as the 20:20:20 targets, which includes an EU ambition to reduce primary energy consumption across the EU in 2020 by 20%. 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 the scope of savings to include both supply and demand side efficiency gains.

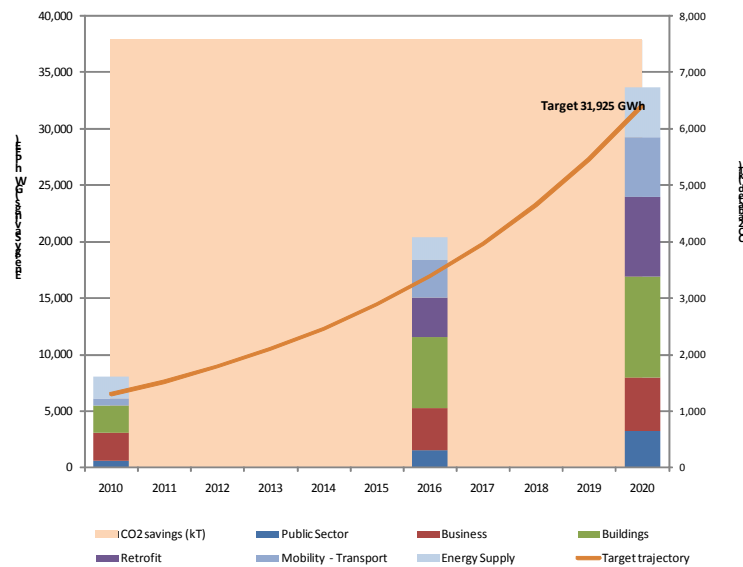
In order to demonstrate the leading role of the public sector in driving delivery of energy efficiency improvements, and to demonstrate the significant benefits available, a specific 33% savings target has been set for the public sector for 2020; equivalent to 3,240 GWh. These three targets¹⁷ cover the following areas:

- A 20% national savings target for 2020 as set in the Government's 2007 Energy White Paper 2007, *'Delivering a Sustainable Energy Future for Ireland'*, applicable to the whole economy i.e. non-ETS and ETS sectors.
- A 9% savings target for 2016 associated with the Energy Services Directive (ESD) applicable to non-Emissions Trading Scheme (non-ETS) sectors only.
- A 33% savings target specifically for the public sector for 2020.

Figure x – Energy and CO₂ Savings and target trajectory to our national 20% energy savings target for 2020

¹⁶ i.e. both the non-ETS and ETS sectors.

¹⁷ 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 SEAI (EPSSU) annually. Detail of ongoing work to improve the accounting procedure for energy demand for the public sector is provided in **Chapter x** of this report.



Progress to Date

National 20% target

Energy efficiency gains achieved to the end of 2010 account for over 26% (8,310GWh) 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 2 million tonnes have also been achieved. Should all measures detailed in this 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 7.6 Mt CO₂. This represents a potential reduction in energy spend across all sectors of approximately €2.25 billion (€₂₀₁₀) as a result of the savings.

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.¹⁸ Statutory Instrument 542 of 2009¹⁹, 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 falling just short of this target. These savings have been achieved across a broad range of energy users within the public, commercial, household, transport and agriculture sectors. Large emitters of greenhouse gasses covered by the EU Emissions Trading Scheme (ETS)²⁰, and aviation and marine bunker fuels are excluded. Projected savings to 2016 from measures detailed in this plan are expected to exceed the 2016 ESD target (17,130 GWh).

¹⁸ 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 X, ESD). It accounts for the conversion losses in electricity generation and makes units of different energy streams more comparable.

¹⁹ S.I. 542 of 2009, European Communities (Energy End-use Efficiency and Energy Services) Regulations 2009.

²⁰ As defined in Directive 2003/87/EC.

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

Public Sector 33% target

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.

Improvements to new and existing public sector buildings made through demonstration programmes and grant scheme contribute the majority of savings to date in the public sector. This includes efficiency gains through the deployment of cogeneration and renewable heating sources in the sector. Public transport efficiency improvements have also been achieved. **Table x** below summarises progress made towards achievement of 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 subsequently provided for each target below.

Table x - Targets, progress and ambition

	Energy Services Directive 2016 9% target (non-EST 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%

Action to date

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

Regulations and retrofit account for the majority of savings to date in the buildings sector. Supports for large industry via the LIEN and Energy Agreements Programme have also had a significant impact. Efficiency of the passenger vehicle fleet and aviation efficiency account for the progress in the transport sector. Improvements to public sector buildings (new and retrofit) have also made a contribution to savings achieved.

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

20% target: energy savings achieved and expected

This Action Plan represents a drawing together of actions and measures that will deliver energy savings. There is no one measure or programme that will realise all of our target, rather it is about identifying the most cost effective combination of policies that will get us to where we want to be in 2020. The following table includes some completed actions (to the end of 2010), some ongoing, and some committed future actions, such as future building regulations.

	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 roll-out	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
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

This above table 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 Y.

Sector summary

Public Sector

Contributions have already been made within the public sector through recent grant schemes (SEEEP and EERF), and through deployment of CHP and renewable heat technologies (ReHeat) both of which provide efficiency improvements over conventional energy sources. The majority of 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 in Ireland. Other key areas of opportunity being exploited include supports provided to SMEs to realise energy savings, and the availability of tax breaks (via the ACA 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 light bulbs 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 sector via the *Better Energy Programme*, launched in 2011, holds the most significant potential for energy savings – a fact recognised across the EU as Member States work to improve the standards of the existing building stock which will be in occupied for many years to come.

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 significant effect on vehicle purchasing patterns. The deployment of electric vehicles also holds significant 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 roll-out 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 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 expected

The breakdown of energy savings achieved to the end of 2010, and expected to 2020, in the public sector is provided in Table x 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.

Table x – 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	1255	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	1000	0	114	223
Public transport efficiency	90	160	160	23	40	40
Total	650	1,975	3,240	155	455	730

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 but 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 will be 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.

2016 target: energy savings and expected

The following table provides savings estimates for the same list of actions as above, however only includes 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.

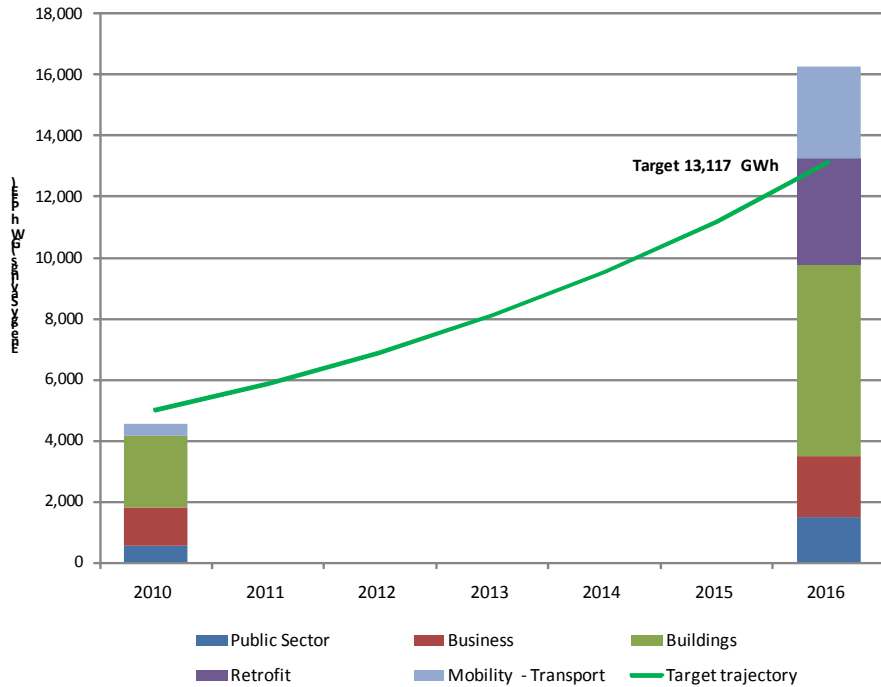
	Energy savings (GWh PEE)		CO ₂ savings (kt)	
	2010	2016	2010	2016
Public Sector				
Public Sector Programme	75	645	17	149
Green Public Procurement (via ACA)	25	155	5	33
SEEEP and EERF (public sector)	90	90	21	20
Public Sector Building Demonstration Programme	140	140	33	32
CHP (public sector)	120	160	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 -	1,280	1,280	312	312

Dwellings				
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 roll-out	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 occurs within 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 roll-out of the measures detailed above. Figure x below summarises the savings contributions from different sectors.

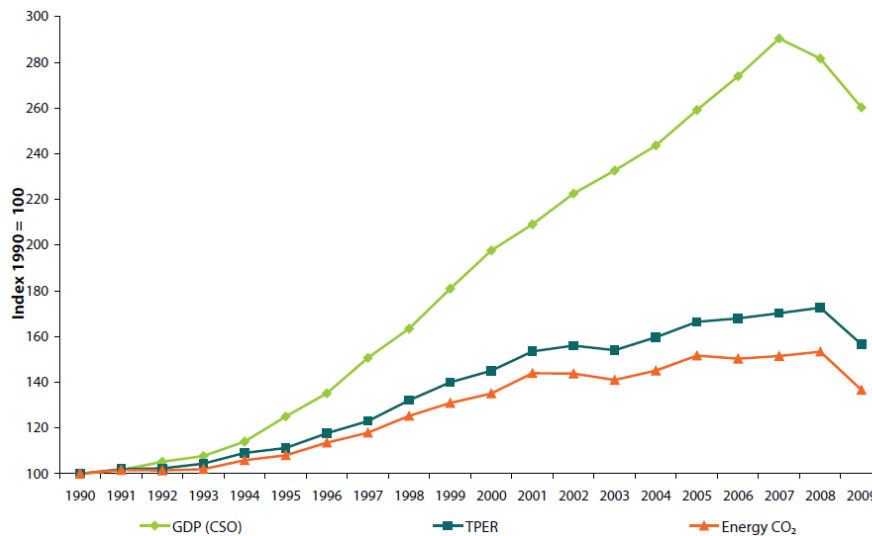
Figure x – Achieved 2010, and estimated future savings contributions to the 2016 ESD target.



CO₂ targets: emissions avoided and expected

An ancillary benefit of energy efficiency savings are the avoided CO₂ emissions, which are estimated at just under 2 million tonnes in 2010 and 4.7 million tonnes in 2016. If the full 20% efficiency target is achieved in 2020 total CO₂ emissions savings of 7.6 million tonnes estimated. This reduction is equivalent to emissions from around 1 million homes or 3.5 million passenger cars by 2020.

Figure x – Relationship between economic growth (GDP) and energy demand (Total Primary Energy Requirement; TPER) and energy related CO2 emissions.



Future ambition: a significant challenge

Energy savings to the end of 2010 detailed in this plan are estimated at over 8000 GWh per annum. As outlined above, this represents a reduction in energy spend of over €460 million per annum across the sectors identified. The significant potential for future savings, should all measures detailed in this plan reach their full potential by represents a potential reduction in energy spend across all sectors of approximately €2.25 billion (€₂₀₁₀).

Whilst we have identified a list of existing and proposed measures with associated savings estimates demonstrating a potential pathway to reaching our targets, their achievement will require sustained effort from both Government and the private sector.

Much of the ambition for future savings is accounted for within the buildings sectors, with broad scale retrofit (via Better Energy) and ongoing improvements to Building Regulations 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, as can be seen in Figure x below. In other words, as the economy grows, energy demand traditionally increases also. However in recent years demand and growth are progressively being de-coupled arising from greater efficiencies being achieved and reduced economic output. With reduced economic activity i.e. since the beginning of the recession in 2007, energy demand has also declined. However, on the basis that our energy savings targets 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.

As such, achieving the targets is now more challenging than ever. The 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 imperative than ever.

Chapter 3: 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 into the public bodies' culture and business processes.

Introduction

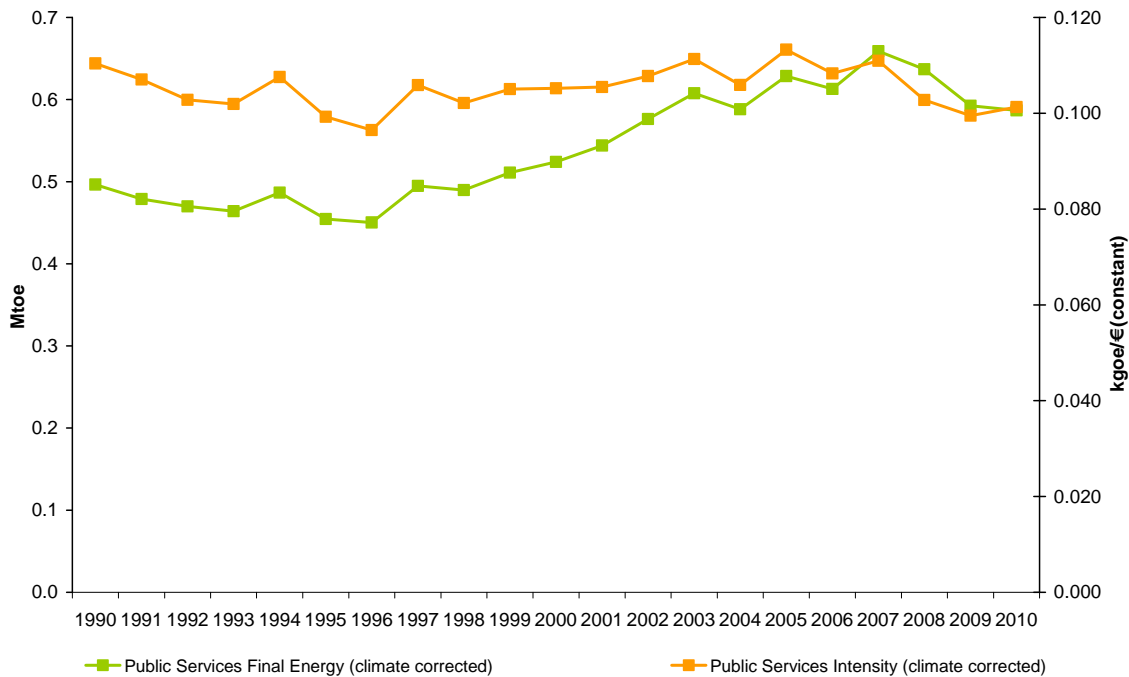
The public sector annual energy spend amounts to about €450-500 million (2009). This considerable purchasing power can be leveraged to promote the market to provide energy efficient goods and services. The SEAI's experience is that proven management and technology solutions can deliver significant savings in energy use. This can release valuable funds where they are needed: for delivering public services.

If approached systematically, the public sector has the potential to 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 organized. Secure senior-level management commitment and by motivating behavioural change in staff Above all, embedding sound energy management structures facilitates good decision making with respect to four key aspects of energy efficiency: designing, procuring, operating and maintaining buildings, equipment, vehicles and infrastructure.

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 Balance²¹ (produced annually by the Energy Policy Statistical Support Unit in the SEAI). The 2009 value is 595 ktoe, 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.

In 2010, the SEAI commenced a three-year project to establish a robust monitoring and reporting system. This system will enable public bodies to report on their energy consumption from 2011 onwards (in accordance with their reporting obligations under S.I. 542 of 2009. More information on the project is detailed in section XXXX

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.

²¹ http://www.seai.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_1990-2009.pdf

- 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 & machinery.

Ongoing NEEAP1 Actions

Legislation

1. 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) transposes Directive 2006/32/EC into Irish law. The regulations set out several obligations on public bodies with respect to their exemplary role for 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 that is managed by the SEAI. Typically, ‘Triple E’ products are 10-15% more energy efficient when compared to standard alternatives and have reduced energy running costs. On a life cycle basis, they have the potential to achieve significant energy savings.
- The *European Communities (Renewable Energy) Regulations 2011* (S.I. No. 147 of 2011) transposes 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.

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 energy management culture in the public sector.

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

The SEAI Partnership programme helps public sector bodies to work towards the 33% target, whilst saving money, improve the environment and meet national obligations, by making significant reductions in their energy usage. The programme engages at senior management level within organisations and provides tailored support delivered in partnership with those organisations that demonstrate commitment to strategic energy management.

In November 2010, a group of fourteen leading public bodies committed to the SEAI's Energy Partnership initiative to deliver total cumulative energy savings of €330 million by 2020. The initial group of leading organisations, 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 [implementing energy efficiency measures.

Case Study: The bulk of Bus Éireann's annual energy consumption is the fuel used by its vehicle fleet (over 30 million 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 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 world 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.

3. We are to facilitating and enabling 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, to identify opportunities for savings and to 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 the 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 significant scope for achieving valuable energy savings in the sector: for poorly performing systems (of which there are very 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.

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

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) into 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 for 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, County Kildare. The detailed design of the plant was largely complete so the scope of the review was limited to suggesting improvements to optimise the current 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 within Kildare County Council.

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

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 is 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 policy makers. The objectives of this group will be to overcome practical barriers and share experiences amongst senior management and officials.

6. We provided funding support for Energy Efficiency Projects in the public sector.

Outlined further in the Business Chapter under Action X.

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

Altogether, local authorities spend about €10 million annually on energy, the majority 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 significant 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.

8. We have developed a framework for energy efficient 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. The NPS 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 €20 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% eventually rising to 40% in 2020.

By April 2012 the NPS had successfully run aggregated competitions for the supply of electricity to the central government, Vocational Educational Committees (VECs), local government, and university sectors. 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 very significant level of energy data into what will potentially become the first public service national energy data base.

In all others 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 is compliant 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 good and 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 European Union (Energy Efficient Public Procurement) Regulations 2011 oblige public bodies to only purchase equipment from the *Triple E* register. Public procurement should take energy efficiency into account. In this way, public procurement will help to enable Ireland's public sector to meet the 33% energy efficiency improvement target, set for 2020 under the National Energy Efficiency Action Plan.

The SEAI, DECLG & DCENR have developed a three part framework for energy efficient procurement. This framework is presented in the Chapter 7 of **Green Tenders - An Action Plan for Green Public Procurement**. The framework helps public bodies undertake energy-efficient procurement by improving what they procure and how they procure. Energy-efficient procurement is good procurement: not only does it reduce energy consumption and deliver 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. The SEAI & DCENR will continue to work with the Department of Environment, Community & Local Government to promote and encourage the principles of the SEAI's three-part framework for energy efficient procurement into the Green Public Procurement National Action Plan.

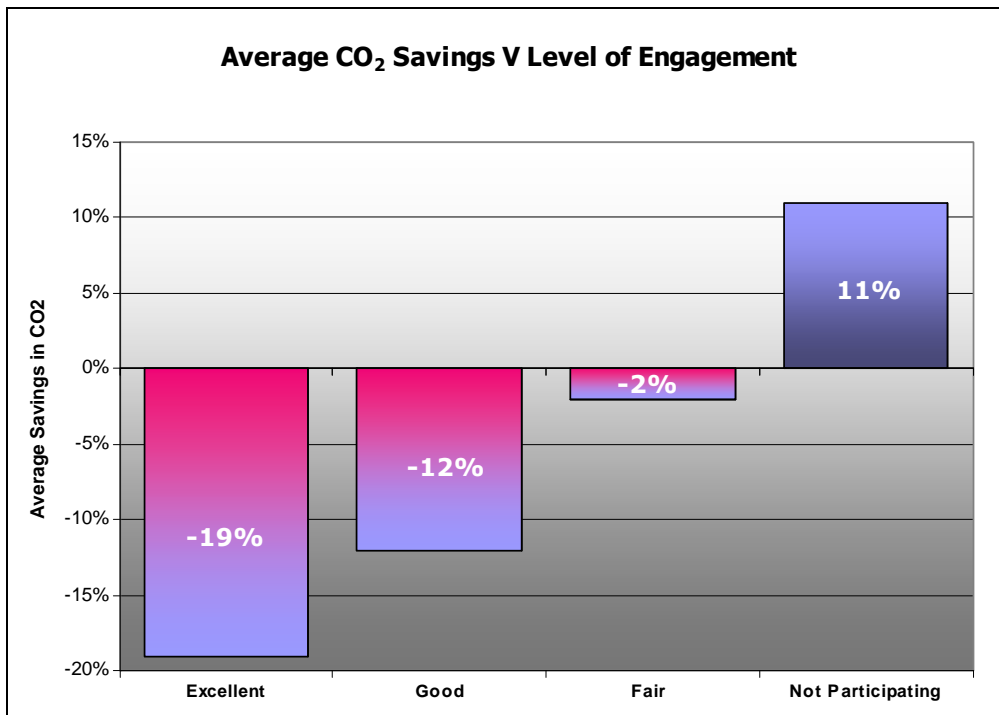
9. The OPW will continue to operate the Optimising Power @ Work programme in support of public sector energy savings targets.

The state-wide energy conservation campaign entitled "*Optimising Power @ Work*" (Phase 1) was originally launched in January 2008 and ran until May 2010. Phase 2 of the initiative commenced in June 2010 will run until May 2012. The aim of Phase 1 was to achieve a reduction of 15% in total annual Carbon

Dioxide emissions in each of approximately 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 Carbon Dioxide (CO₂) emissions. The reported savings are calculated against a Benchmark Year, which for the majority of buildings was 2007, i.e. the year prior to commencement of the campaign.

One of the most significant factors that influenced the level of savings achieved in a particular building was the level of engagement of the staff. 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 ½ year period of Phase 1.

It is essential that the savings that have already been achieved are maintained; as experience shows that without intervention the buildings will quickly revert to

their pre-campaign consumption levels. Phase 2 of *Optimising Power @ Work* commenced in June 2010. The main aims of Phase 2 are to achieve:

- 1) A 20% average saving in carbon dioxide emissions across the 250 buildings in the campaign.
- 2) A minimum saving of 15% in carbon dioxide 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) In buildings, which have already achieved (in phase 1) in excess of the 20% target, a 5% further reduction in CO₂ emissions.

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

In the longer term, buildings in the portfolio with floor areas <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.

10. 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 recognized 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 thirty-nine research projects at various stages.

The Department is constructing two schools to the passive house standard – the world's leading low energy building standards. 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) build in accordance with the TGD's 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 planned for 2012, the Minister for Education and Skills has announced details of 219 new major school building projects which will begin over the next five years, as part of a two billion capital investment programme.

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

- 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.energyineducation.ie ;
- Explore on a pilot basis a metering and display programme for school energy and water consumption monitoring.

NEW ACTIONS

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

Organising for Success

Achieving the 33% target by 2020 will involve more than simply picking the ‘low hanging fruit’. Instead, 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.

11. We will develop a suite of integrated programmes and supports to assist public bodies 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 Department of Environment,

Community & Local Government), for schools (in partnership with the Department of Education & Skills) and for public buildings (with the Office of Public Works).

12. We will introduce obligations 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.

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 ISO 50001 *Energy Management System*.

13. 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 & 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.

14. 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.

- 15. 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.
- 16. 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.** This will help to integrate best practices into projects from the outset and minimise the lifecycle energy intensity of these developments. It will save money by reducing both capital costs (e.g. for utilities and processes) and operational energy consumption.
- 17. 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, Enterprise Ireland and other stakeholders to establish the public sector as a demonstration ‘test bed’ to trial innovative energy efficient technologies and services.
- 18. 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 2012;
 - 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;
 - Targeting the refurbishment of public 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 are 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 9th July 2015;
 - Requiring that all new buildings occupied or owned by public bodies from 31st December 2018 are nearly zero-energy buildings²².

²² 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.

Procurement & Funding

It is essential to fully integrate energy efficiency into 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.

19. 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.

20. 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 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.

21. We will establish a national advisory service for supporting innovative models of retrofitting and ideally financing energy efficiency measures in the public sector e.g. Energy Performance Contracting (EPC) and Energy Service Companies (ESCos).

This service will:

- Provide expert assistance to public bodies wishing to implement energy saving retrofit projects utilising 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 etc.
- 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, the 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.

Monitoring & Verification Systems

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

22. 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 own 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 throughout 2012 and 2013.

23. 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, their energy performance (e.g. in terms of their core activities using an appropriate energy performance indicator) and their 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 will 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, etc.
- In order to minimise the data manipulation and reporting burden on public bodies, the system will share data with the EPA'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 which 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 eighteen public bodies, with a combined annual energy spend of €19 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 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 own annual reports.

Beginning with the pilot phase and continuing over the coming years, the system will generate better quality energy consumption data for the sector. The 2011 pilot exercise and initial data exchange with the meter operators contributed to a significant improvement in 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 significant 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 ten 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 4: Energy Supply Sector

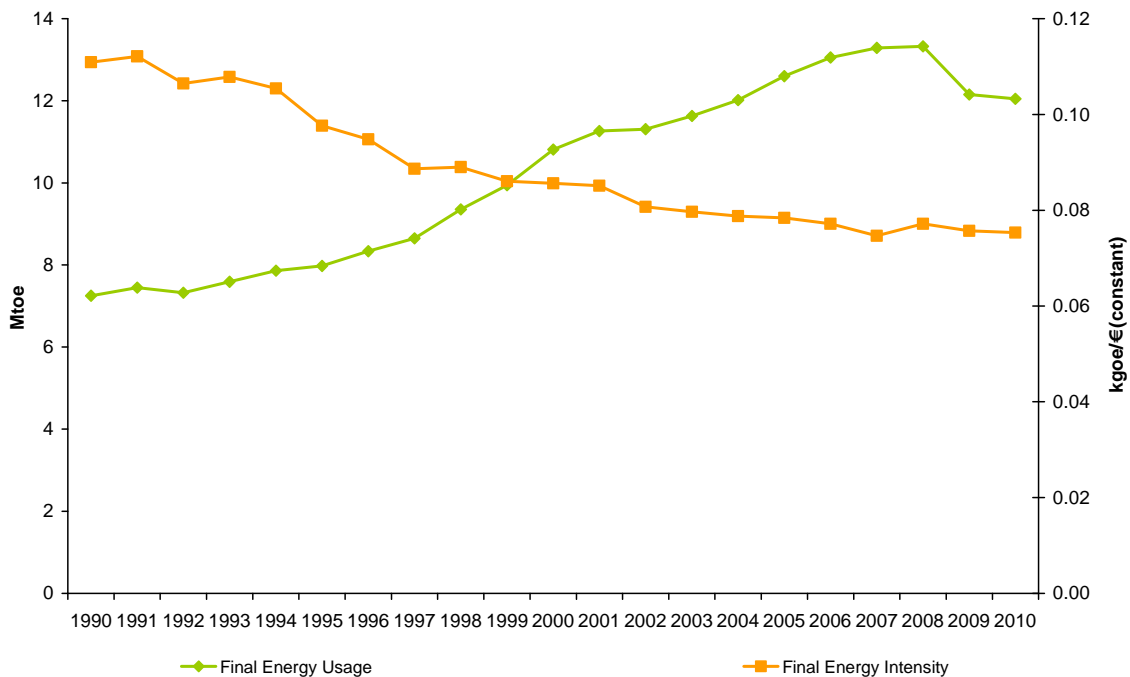
2020 Vision

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 roll out 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.

Energy Use in the Economy



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 significant energy saving potential.

The generation of end-use energy (electricity) is characterised by the use of gas, with a trend in recent years towards bringing into production more energy-efficient combined cycle gas turbines (CCGT), along with valuable improvements in infrastructure that has

resulted in an upward efficiency trend in recent years. However, generation is, even by today's standards, relatively inefficient with significant losses occurring in converting primary energy sources, such as gas, oil or coal, into electricity. Typically 50–65% of the energy of the input fuel is lost. A further 7.5–8% 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 X above.

Improvements in supply side efficiency have been driven by shifts from old peat- and coal-fired generation plant, with an efficiency of around 30–35%, to modern peat plant with an efficiency of around 40% and combined-cycle plant with an efficiency of around 50–55%. Other technology and operational improvements, such as reduced losses in transformers, motors and generators, have also contributed, as have reinforcements to the transmission and distribution networks.²³

The current generation mix in Ireland comprises some 30% new, efficient, Combined Cycle Gas Turbine (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 7 years, 1,300MW of older plant will potentially be replaced by about 850MW 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, 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.

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.

Ongoing NEEAP1 Actions

Since the publication of NEEAP1, a number of key developments in the energy sector have been made in the following areas.

²³ For example, upgrading the 10kV distribution system to 20kV has made a significant contribution to reducing distribution losses.

All-Island Energy Market

1. **We are promoting competition and choice and continuing to developing the All-Island Energy market framework across a range of energy priorities, building upon 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 Framework has the overall aim to provide 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 Single Electricity Market. The SEM will underpin capital investment decisions impacting on generation, import and export of electricity and through that on 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 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

2. **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 level reductions via payments based on pre-approved demand reduction and peak consumption reduction rates. Customers who reduce their demand and consumption according to their committed levels are rewarded. Customers who significantly deviate from

committed levels do not receive payments, or receive a lower payment. Payments are made to participants by their respective supplier.

The scheme has delivered approximately 100MW 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 2020 in 2011 which envisaged the development of more market based 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.

3. We will reduce electricity distribution losses to 7.4% in 2010.

As part of the Distribution System Operator's (DSO) revenue control covering the period 2006 to 2010²⁴, 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 Efficiency Obligations

4. We are working towards the introduction of Energy Efficiency Targets for energy suppliers.

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

Central to the delivery of the energy saving target will be to continue 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 saving target cycle.

New Actions

Investment in New Generation Plant

²⁴ CER/05/138 CER Decision Paper on Distribution System Operator Revenues

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

In the next few years 1,300MW of older plant will potentially be replaced by efficient Combined Cycle Gas Turbine (CCGT) and increased wind capacity²⁵. 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 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 46% 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 CCS will be monitored for application in Ireland in the medium to long-term.

Smart Grid Development

6. 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. The Smart Grid has the potential to help manage increased operational complexity and integrate consumer behaviour while enhancing power system reliability and increasing network efficiencies. In order for the Smart Grid to develop, Ireland must engender an environment that allows innovation and enterprise to flourish while remaining cognizant 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 will 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, increased levels of renewable generation, and work with all relevant stakeholders in order to maximize the full potential of Smart Grids.

Transmission, Distribution and Operational Efficiencies

7. We will reduce electricity distribution losses to 7.1% in 2014

²⁵ Source: The Generation Adequacy Report 2008-2014 (Eirgrid, 2007)

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.

8. Upgrade of Electricity Distribution Network

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

9. 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 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 require 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, which outweighs the cost of developing that 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 Strategy²⁶, 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, that 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

²⁶ Source: Grid 25: A Strategy for the Development of Ireland's Electricity Grid for a SUSTAINABLE Energy Future (Eirgrid, 2008).

gas supply system as well as developing more efficient technology for future installations.

Promoting Competition

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

The SEM, which is a gross mandatory pool^[1], is a market that offers participants significant levels of 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 the information paper the *State of the Nation Review* and subsequently 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 are 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 consumer 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.
- Sales personnel calling to homes will be required to provide a doorstep checklist to customers.
- Suppliers will be required to provide twelve 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.

Demand Side Management

11. We will significantly expand our demand side management initiatives.

^[1] 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

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 – as discussed under 65.

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 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)

12. We will achieve at least 800MWe 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 utilises the heat from electricity generation that would otherwise be wasted. This process leads to a reduction in overall primary energy usage of 20%–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 Sustainable Energy Authority of Ireland between 2006 and 2010 with a total expenditure of €7.5m. 95% of the capital assistance was spent on the deployment of small-scale (<1MWe), 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.

Electricity Micro-generation Programme

13. 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).

The programme followed a change in regulations in 2007 allowing people to sell electricity back to the grid, which it is hoped will 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 Department for Environment for certain categories of small-scale generation from low-carbon sources.

This action 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 roll out of smart metering.

14. 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 which can increase the overall electricity network efficiency and incorporate a high input of renewable energy.

A smart grid is one which 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. lower price energy offered at off-peak times when there are high winds). Smart grids reduce the need to store energy generated by renewable sources.

REFIT

15. 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 Combined Heat and Power using biomass and anaerobic digestion and it aims to incentivise the addition of 310MW of renewable electricity capacity to the Irish grid. Of this, up to 150MW will be High Efficiency Combined Heat and Power (CHP), using both Anaerobic Digestion and the thermochemical conversion of solid Biomass.

Chapter 5: Transport Sector

2020 Vision

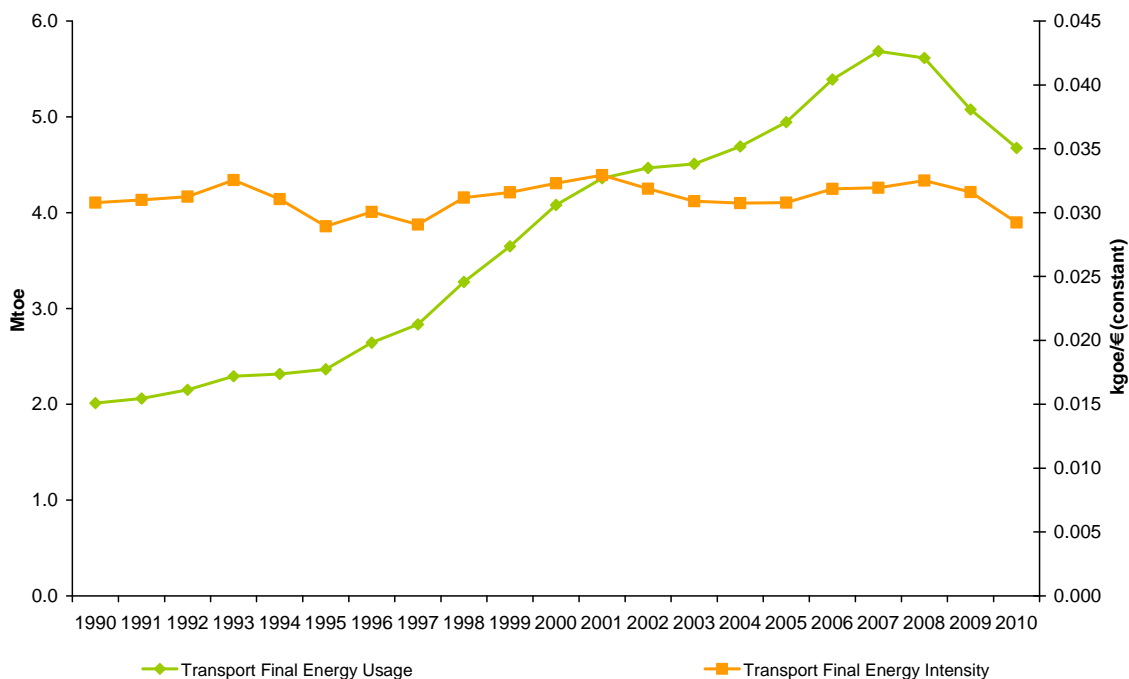
Ireland will continue to progress towards a more sustainable and energy efficient transport sector in particular through promoting improved technology and actively supporting changes in travel behaviour.

Achieving the Vision

- Investment in public transport infrastructure to enable a reduction in the number of car journeys.
- We will ensure future housing and enterprise development occurs alongside appropriate development of transport infrastructure.
- We will promote alternative forms of transport, including the use of electric vehicles.
- We will promote continue 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 59,000 GWh, or 5,075ktoe (final energy consumption), in 2009. This represents a reduction on 2007 levels of 11% based primarily on reduced economic activity and associated energy demand for transport. Energy usage in the transport sector grew by 151% between 1990 and 2009. As can be seen in Figure x, below, the rapid historical growth rate for transport energy demand reversed at the beginning of the recession in 2007. A significant contributing factor to the reduced demand in the sector is down to 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. Whilst there has been an increase in efficiency of vehicle use, this has been far outweighed by the increasing number of vehicles, 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 which are outlined in further detail in this chapter.



Introduction:

The transport sector measures in NEEAP1 were developed in the context of the Smarter Travel Policy (the Governments Sustainable Transport Policy for Ireland which covers the period from 2009 to 2020) which was 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 and 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 within 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 arrangement 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 NEEAP1, a number of key developments in the transport sector have been made in the following areas.

Energy Efficient Vehicles

- 1. We will continue to incentivise the purchase of more energy efficient vehicles**
NEEAP1 outlined the rebalancing of Vehicle Registration Tax 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 off-set 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 Vehicle Registration Tax and Motor Taxation rates, which came into effect from 1st July 2008, was specifically to incentivise the purchase of lower emissions/more energy efficient cars. Under this new system both Vehicle Registration Tax 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 164g/km. This had fluctuated around a level of 165-168g/km since the year 2000, up until the rebalancing took place 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 145g/km. This fell further to around 134g/km in 2010. The net result is that the average car entering the national fleet is now almost 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 impacting on the composition of the national car fleet much more quickly than for a taxation system which does not operate on the basis of emissions/energy efficiency. The net effect is to speed up the lowering of emissions within the national fleet, compared to EU measures alone, and offer significant fuel savings over the lifetime of each vehicle. It is estimated that savings of 357 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. A review of this policy will take place in 2012. The net saving from the EU technology measures and the taxation rebalancing combined are estimated at 2,424 GWh and 3,797 GWh in 2016 and 2020 respectively.

Electric Vehicles

- 2. 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 the coming years.

A grant support scheme, which is administered by the Sustainable Energy Authority of Ireland, commenced 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. €1.5m has been 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 along with the ESB agreed a Memoranda of Understanding with a number of car manufacturers to ensure supply of electric vehicles into the Irish market. The ESB are 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 Electric Vehicles. These will be located in every city and town with a population of more than 1,500. 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 inter urban routes.

3. We are enabling more fuel-efficiency, inter-urban freight and private car movements through improved road infrastructure

The major beneficial road infrastructural improvements which were identified in NEEAP1 have been delivered through the completion of Major Interurban Routes (MIRs). This programme was completed in December 2010. Where the infrastructure has 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 for 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.

4 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 tested in 2010. All cars in Ireland are subject to periodic testing on reaching the 4th anniversary of their first registration and every 2 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 of each vehicle. This commercial vehicle testing applies annually to over 200,000 vehicles.

5. We are continue to promote the benefits of eco-driving

Since the publication of NEEAP1 we have made progress on promoting eco-driving. The Sustainable Energy Authority of Ireland (SEAI) has championed eco-driving over many years, including recognising in the 2011 – 2015 Strategic Plan 15 the need for driver training and fleet management. Furthermore, the RSA, which has responsibility for driver testing, is addressing the issue of eco-driving in two ways. Firstly, under the Learner Driver Training programme the RSA are 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 it looks at (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 are looking at their approach to assessment of faults to see the degree to which and how they apply fault marks to various driving behaviours to ensure that any aspect of driving consistent with eco-driving (a) is encouraged and (b) is not penalised by being marked as a fault. While this is consistent with the approach to marking the driving test as currently adopted, it will become a defined part of the driving test from Spring 2012.

During the period of NEEAP2 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, whilst continuing to facilitate the economically efficient movement of people and goods.

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

Demand Management was identified in NEEAP1 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, with the National Roads Authority (NRA) publishing a “National Roads Traffic Management Study” in February 2011. The study represents an in-depth analysis of potential traffic management measures, through (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.

7. 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 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 one hundred 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 have shown 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 Middleton, 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 NEEAP2.

8. We will continue to promote National Cycle Policy Initiatives

In addition to the above mobility management issues, NEEAP1 noted the potential for modal shift to cycling to reduce emissions and energy consumption within 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 carried out in April 2011 will allow some measurement of the impact on these project on modal shift within 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 the region.

Case Study: Dublin Bikes Strategic Planning Framework 2011-2016

Dublin City Council in partnership with JCDecaux launched the new dublinbikes scheme on the 13th of 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 5 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 now been used for over 3.17 million journeys, with 66,000 subscribers. The first phase of the dublinbikes expansion will get under way in summer 2012 with 1,000 new bicycles expected by early next year. 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.

9. We will continue to 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) was established in mid-2008, and 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 significant fuel savings and emissions reductions associated with two projects, the En Route Shannon Upper Airspace Redesign project (ENSURE) and the Night Time Fuel Savings Routes project (NTSFR). The former project delivered savings of 14,800 tonnes of fuel, and the latter generated 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.

10. 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 sustainable development by ensuring that the planning system supports targeted investment on 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 draft manual for public consultation is expected in the second half of 2012

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

11. 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 2,500 companies now purchasing monthly, part yearly or annual tickets for their employees. Employees can save between 31% - 52% in tax and social insurance charges compared to normal ticket purchasing.

Carbon tax

12. 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 terms of long term fuel demand, with estimated long run elasticities as high as 0.7, and short run elasticities in the region of 0.3²⁷. Using a conservative estimate of the long term elasticity value being 0.15 indicates that the existing Carbon tax of €15/tonne could result in energy savings within the transport sector of 318 GWh in 2016, and 331 GWh in 2020.

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.

²⁷ Thomas Sterner (2007) Fuel Taxes: An important instrument for climate policy. Energy Policy 35 (2007) 3194-3202

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

Regulation 1222/2009 on the labelling of tyres comes into force on 1 November 2012, and will introduce 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, Ireland will have an important role in ensuring that the Regulation is fully implemented through appropriate market surveillance.

14. 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 shut-down 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 impact of these measures is resulting in annual energy saving 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 NEEAP2, with equipment to monitor engine performance in this regard will be fitted to 4 commuter diesel multiple units for testing. Furthermore, building on the savings achieved through automatic shut down and restart for diesel multiples units, it is planned to implement similar measures for the auxiliary engines in diesel multiples units, and for locomotives, subject to satisfactory test results. It is estimated that these measures could offer potential additional savings of up to 37 GWh per annum.

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

Since 2009 a range of programmes aimed at improving energy efficiency have taken place within Dublin Bus. Reduced congestion on routes, brought about through improved bus priority on the network, has resulted in significant

improvement in 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 contributed significant 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 in the process of 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, which is currently in progress, will continue and it is expected that the annual savings in this regard 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 which is estimated at a 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.

16. 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.

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

November 2010 saw the launch of the "GoSafe" programme which will provide 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 future 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 6: Business Sector – Industrial & Commercial

2020 Vision

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

Achieving the Vision

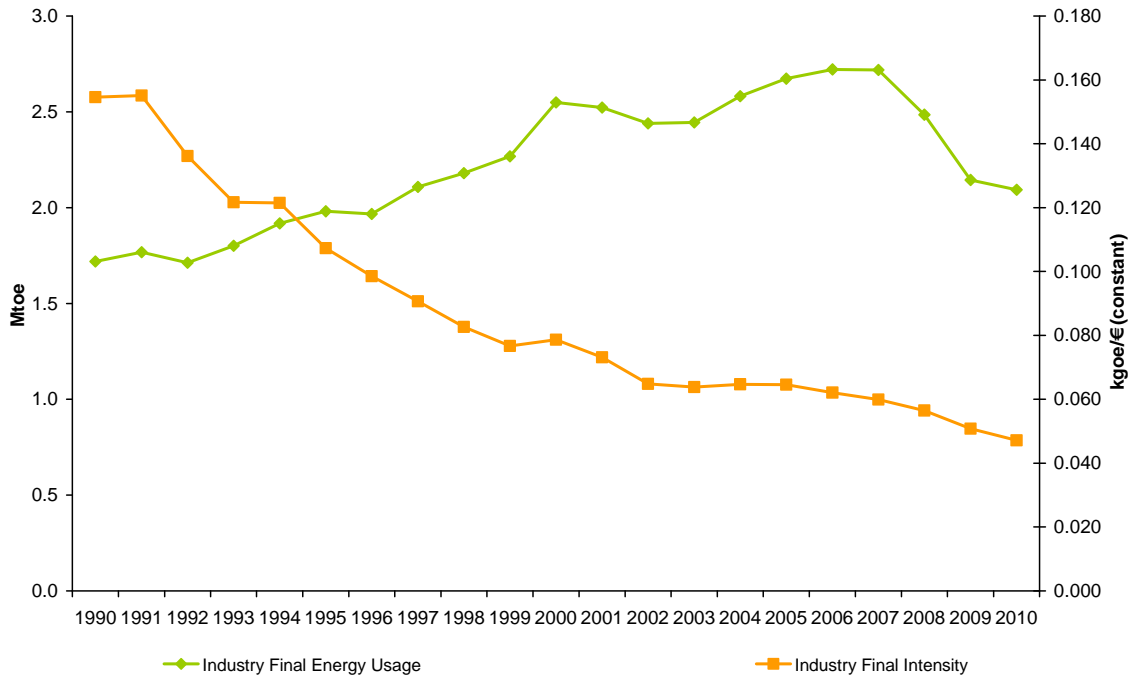
- We are continuing to provide procurement guidance and tax incentives to encourage companies to buy the most efficient equipment.
- SEAI will offer networking, training and advisory services to all businesses seeking to reduce energy usage.
- The largest energy users are undertaking best international 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 which 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 the provision of 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 significant cumulative multi-annual progress to date, substantial further energy efficiency potential is being targeted over the course of this Plan.

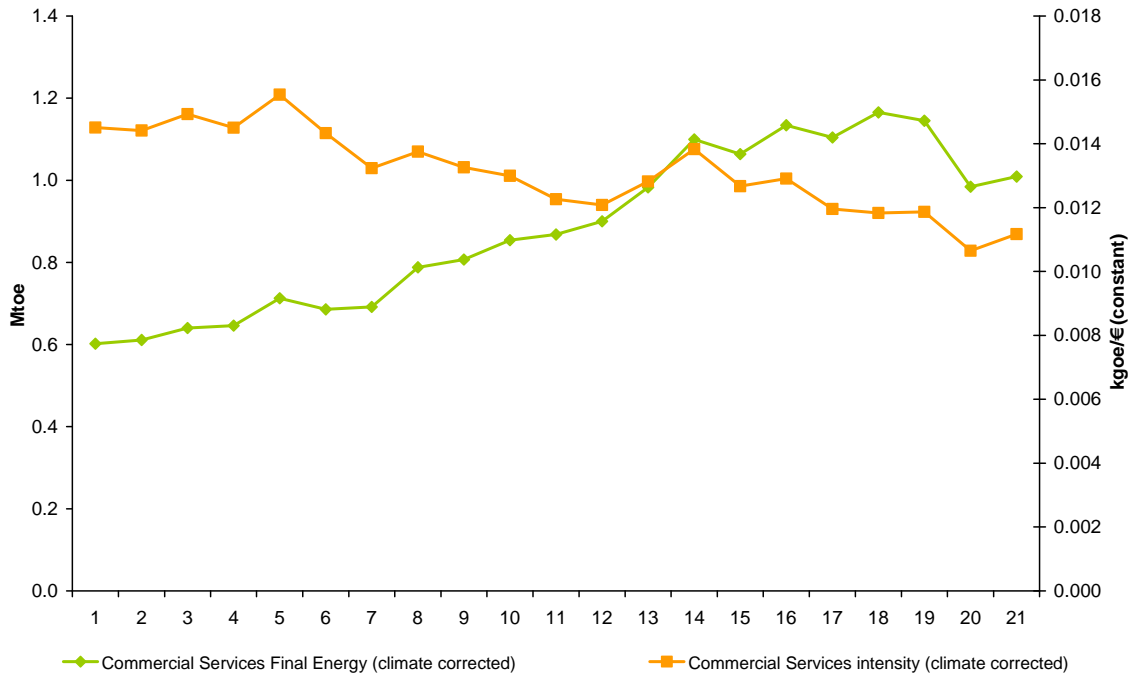
Energy Use in Industry

Energy use in the industrial sector amounted to 25,759 GWh (final energy consumption) in 2009, a reduction of around 18% on 2007 levels – largely as a result of the economic downturn. Energy usage grew by 29% in the industrial sector between 1990 and 2009, as illustrated in **Figure x**, below. This growth masks the nature of structural change within 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.



Energy Use in 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 within the services (tertiary) sector. Services sector data is provided in the Energy Balance (produced by EPSSU, SEAI, annually) as a residual, following definition of the final energy use within the industrial, residential and transport sectors. On this basis, energy usage in the commercial sector is estimated to have amounted to 11,530 GWh (final energy consumption) in 2009. As illustrated in **Figure x** below, significant growth in energy use is estimated in the sector between 1990 and 2009 (79%). Electricity 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 significant improvement in energy efficiency overall and increasing added value for a given energy input.



Ongoing NEEAP 1 Actions

Accelerated Capital Allowances (ACA) Scheme

1. 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 3 years in Budget 2011. There are now 52 technologies covered within 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 foregone of €0.6m.

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 2011²⁸ state that all public procurement shall reference this database when procuring new equipment or vehicles.

Large Industry Energy Network (LIEN)

2. 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. Now in operation for 16 years, today it engages some 150 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 approximately 70% 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 migrating to ISO 50001) verified by independent audit. It carries formal targets and action obligations, and special investigations supported through the programme have led to the identification and extraction of deeper energy savings opportunities across a number of technologies and services.

Of the 150 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, with the Irish Energy Management Standard (I.S. 393) being influential in setting the basis of the European and International Standards.

Small and Medium Enterprises (SME)

²⁸ European Union (Energy Efficiency Public Procurement) Regulations 2011 (S.I. No. 151 of 2011)

- 3. 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 within the company.

Over 1,800 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 with energy cost savings of up to 30% achieved in many cases.

Green Enterprise Guide²⁹

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

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.

The development of the guide following a recommendation of the High-Level Action Group on Green Enterprise to work towards offering an integrated suite of efficiency programmes across agencies.

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 from these agencies – depending on whether the client is a large or small enterprise, multi-national, or a public institution. The four agencies will cooperate and provide integrated eco-efficiency support services as may be appropriate to business or institutional needs.

ICT and energy efficiency

²⁹ Green Enterprise Guide

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

5. **We will continue to demonstrate the significant potential available through ICT efficiencies, working closely with the industry, utilizing technological solutions such as virtualization, co-location, efficient IT hardware, optimized cooling technologies, and energy management controls.** The Information and Communications Technology (ICT) sector in Ireland is a thriving and growing industry with 9 of the top 10 global ICT companies having a significant presence in Ireland. The economic contribution of the sector is substantial, with the ICT industry currently responsible for over 25% of Ireland’s total turnover. The sector employs more than 74,000 people. Significantly, 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 principle 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 U.S, 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 €1 million in research funding across 48 projects from 2004-2010, ICT is a varied area of 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 using ICT equipment and data centre and the application of computer simulation to energy problems.

Table x – Summary of 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 considerable energy efficiencies. The following actions are those that we feel offer the most potential over the life of this Action Plan.

New Actions

Market Surveillance

6. 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 actual 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 relating to the energy efficiency and consumption of a product at the point of sale.

There can be a wide variance in the energy use of products that perform the same basic function. Sometimes the most energy-efficient model can be more expensive to buy, but its lower energy use 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 EuP and energy labelling Directives, assisting in the creation of awareness and a market for energy efficient products.

Energy Star

7. **We will work with our European partners in implementing the new Energy Star Agreement during 2012.**

We welcome the communication from the Commission on the Energy Star Programme³⁰ and its recommendation for renewal of the Agreement between the EU and the United States. Energy Star is rightly an integral part of the Union's energy efficiency policy and 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 which 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 has reduced by about 11 TWh is significant. This translates into some 3.7 Mt of avoided CO₂ emissions and that is a welcome trend. We look forward to the conclusion of a new Agreement with the US during the course of 2012.

Better Energy Workplaces

8. **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, SEAI launched Better Energy Workplaces programme which is designed to assist in the energy efficient upgrade of existing non-domestic buildings, facilities and services. The scheme was open for applications for projects from public sector, private sector and community organisations. It will build on the achievements of comparable incentive schemes in 2009 and 2010 (see below).

In 2009, the SEAI delivered a € 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 the majority of the savings, with €2.2m and 9.8kt CO₂ saved.

In June 2010 the SEAI launched the € million Energy Efficiency Fund. The scheme was quickly oversubscribed and over 43 projects were approved. The fund supports exemplar projects which achieve significant and verifiable energy

³⁰ 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

savings and provide key learnings for other businesses and public sector bodies. The projects, 20 of which are public sector, and 23 private and voluntary sectors, were completed by the end of 2010, and the energy efficiency actions taken will create lifetime savings of over €70 million. Some 50,000 tonnes of CO₂ emissions will also be avoided each year as a result.

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 efficient retrofit measures across these sectors. The funding will leverage investment in a significant 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, 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)

- 9. We will spearhead the development of model contracts for EPC/ESCO procurement with a view to overcoming the barriers that exist and are preventing the public sector in particular from undertaking this type of energy project.** While there are recognized barriers to the large scale deployment of ESCO/EPC contracting, the benefits to the public sector in terms of energy savings to be gained are clear.

Constraints on the availability of investment capital, amongst 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 acting as a proving ground for the ESCO model of energy efficiency delivery, it is intended to promote and migrate 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 during 2012 undertake the following deliverable actions:

- SEAI will publish a Guide to EPC to facilitate the market in defining their offerings, build capacity and monitor and verify the savings that can be achieved.
- DCENR and SEAI will target the roll-out 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)

- 10. We will extend the Large Industry Energy Network (LIEN) membership, achieve deeper energy savings and intensify participation in the new international energy management standard ISO 50001.** The Large Industry Energy Network (LIEN) and Energy Agreements programme covers the most energy intensive segment of Ireland's industrial base. Over the lifetime of this Action Plan, this very successful programme will continue its momentum, further extend its membership and achieve deeper energy savings.

It will intensify the participation in Energy Agreements centred around the new international energy management standard ISO 50001 and pursue deeper energy efficiency opportunities 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 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

- 11. We will ensure 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. This will continue to work with key business sector stakeholder groups and will target the more energy intensive sectors such as the hospitality sector in order to increase participation rates.

The one to one advice, mentoring and assessment element of the SME supports for business by SEAI are being redesigned with a view to migrating to a more market oriented model. It is planned that a panel of registered energy professionals, aligned with the provisions of SI 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 to provide for ultimately more effective delivery of these services.

Accelerated Capital Allowances (ACA) Scheme

- 12. We will develop the ACA products list and Triple E register to serve as the recognized reference list for energy efficient procurement.** Budget 2011 and subsequently section 35 of the Finance Act 2011 extended the ACA Scheme for a further 3 years to December 2014 demonstrating the government's commitment to a proven incentive for business. The extension of the Scheme is a win-win for business and the environment. It provides a boost to companies who wish to purchase plant and machinery that are highly energy efficient and in so doing make significant savings 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 2011³¹) 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

- 13. We will develop the construction industry's capacity to achieve higher energy performance standards and in creating sustainable jobs over the lifetime of**

³¹ European Union (Energy Efficiency Public Procurement) Regulations 2011 (S.I. No. 151 of 2011)

this Plan. Notwithstanding the very 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 the industry's capacity to achieve higher energy performance standards in future:

Developing Professional Design Skills: Third level institutions are currently providing levels 7, 8 and 9 energy and sustainability related courses for construction professionals. Professional Bodies and other Continuing Professional Development organisations are also providing additional training for existing professionals. Over 6,000 persons with construction related qualifications have completed the Domestic Energy Assessment Procedure (DEAP) training course and some 530 persons 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 into apprenticeship courses in Institutes of Technology
- Upskilling courses for existing trades through FÁS and the Institutes of Technology
- The National Standards Authority of Ireland (NSAI) has recently put in place a certification scheme for air tightness testers and also for certifying the energy performance of windows i.e. Window Energy Performance Scheme (WEPS)
- DECLG/SEAI/Homebond Acceptable Construction Details are available for use on site
- A Thermal Modellers certification scheme is being put in place by NSAI and DECLG.

With regard to building services trades, supports include:

- Upskilling courses for existing trades through FÁS and Institutes of Technology
- Renewables training modules from FÁS
- NSAI's Plumbing and Heating Code of Practice (currently available for public consultation and due for publication in 2012)
- Technical Guidance Document F 2010
- The agrément certification and installer schemes for innovative and energy efficient products.

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

Build Up Skills Initiative (BUSI)

- 14. 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 approximately 40% of energy consumption in Ireland in 2009 and the Better Energy Upgrade Programme estimates that up to 1,000,000 buildings will require retrofitting by 2020. Coupled with a marked decline in the number of people directly employed in the construction industry to just over 100,000 in 2010 from a peak of over 250,000 just three years earlier along with a Government Jobs Initiative to stimulate job creation in this sector, it is clear that specific energy skills are required and a coordinated up-skilling program 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 whose 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 relevant 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 up-skilling needs of the Irish construction sector.

Chapter 7: 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

- Building Regulations amended to improve efficiency in new homes.
- Introduction of smart meters to encourage energy-efficient behaviour by householders.
- In the domestic sector, a standardised measurement methodology will be used 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.

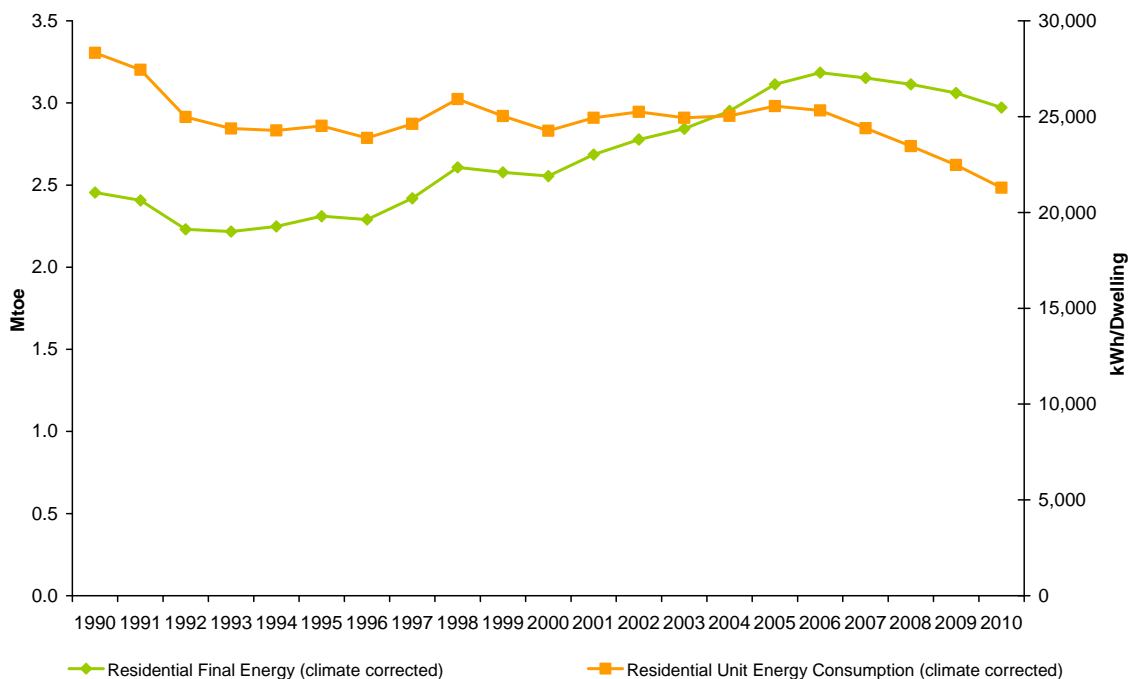
However, it needs to be acknowledged that we have seen a significant decrease in the level of building activity in recent years. While the improved building standards will continue to have an impact, much of our focus must return to retrofitting older building stock if we are to meet our energy efficiency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

There are still obstacles and market failures preventing us 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 in 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 on their bills.

Energy Usage in the Residential Sector

Energy usage in the residential sector amounted to over 36,045 GWh (final energy consumption) in 2009, an increase of 6% on 2007 levels, despite the economic downturn. Energy usage grew by 237% in the residential sector over the period 1990 – 2009, as illustrated in Figure x, below, with the number of households increasing by over 50%. Energy intensity (average energy usage per household) decreased by 11% over the period, reflecting an improvement in energy efficiency of the housing stock, much of it due to higher efficiency standards of new housing. Not all of the improvements in energy efficiency resulted in lower energy usage; in some cases, higher standards of heating and comfort levels followed from the deployment of central heating.



ONGOING NEEAP1 ACTIONS

Better Energy: Homes

- 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 (SEEEP).

Better Energy: Homes, the domestic strand of the programme allows customers to apply for an Exchequer supported incentive, currently a grant but which will migrate to an upfront discount later in the year. 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 Home Energy Saving Scheme.

Since the start of the Homes Energy Savings (HES) Scheme in 2009, to end of 2011, over €19M has been paid to homeowners enabling 110,000 homes to undertake 274,000 energy efficiency measures.

Better Energy: Warmer Homes

2. **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 Warmer Homes Scheme. Applications are collected centrally, via a managing agent, or through a network of community-based organisations who deliver the retrofit work free of charge to the homeowner.

The Affordable Energy Strategy was published in November 2011 and will be the framework for building upon 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

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

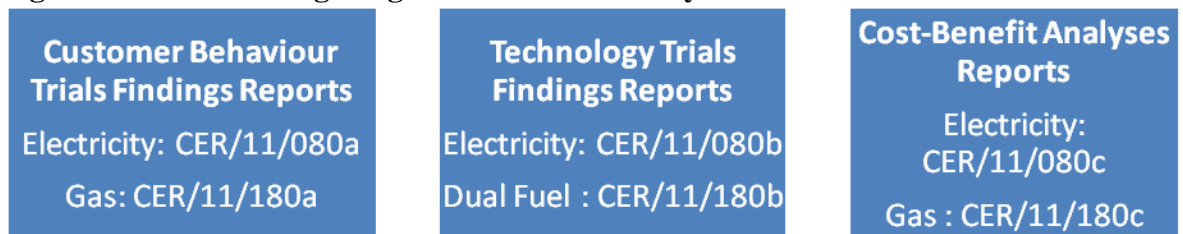
Smart meters are the next generation of meters, which can replace existing electro-mechanical and diaphragm meters and offer a range of benefits for both the individual electricity and gas consumer and for the electricity and gas systems in general. A smart meter is an electronic device that can measure 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 regarding their energy consumption and costs (ii) reduce overall energy consumption; (iii) reduce overall energy bills by shifting any discretionary electricity usage away from peak consumption times. The benefits of smart metering are recognised internationally and there are a number of key EU legislative instruments promoting smart metering to ensure that consumers are properly informed of actual energy consumption and costs frequently enough to enable them to regulate their energy 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 (SEAI), ESB Networks, Bord Gáis Networks and Irish gas & 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, with their 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 findings reports and cost-benefit analyses reports (as depicted in figure below), were published by the CER during 2011.

Figure: Smart Metering Programme Phase 1 – Key Deliverables



This combined suite of electricity and gas smart metering findings 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 (small-to-medium enterprise) consumers in Ireland. In addition, the comprehensive cost-benefit analyses helped 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 that it is minded 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 as relevant, regarding 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. After considering the responses received, the CER is due to publish its final Decision Paper on the national smart metering rollout during 2012. It is envisaged that this Decision Paper, by finalising the national smart metering 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 upon 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 roll-out and the smart grid is dependent on consumers responding to the information on their energy-usage in a positive way. In home display shown in diagram below is an electronic device linked to the smart meter which displays near real time information to consumer 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, electricity usage profiles were established between July and December 2009. Test measures were put in place from the 1st of January 2010 and ended on 31st December 2010.

Consumption data gathered during the 12 month test period was analysed to determine the consumer response to smart metering enabled measures tested in terms of the impact on their overall and peak electricity usage. 82% of participants made a change to the way they use 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 time when energy is cheapest.

Housing Aid for Older People Scheme

- 4. 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 a new Housing Aid for Older People Scheme in November 2007. The Scheme aims to provide targeted support to improve conditions in the existing 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

- 5. 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 will now 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

- 6. We are promoting awareness of the energy efficiency of boilers to homeowners through regular servicing and, where necessary, replacement.**

This awareness campaign is delivered through the SEAI and 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 possibly renewable energy heating systems.

Consolidated Building Regulations 2011

- 7. We have made 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 200kWh per m² per annum in the case of a dwelling constructed prior to the 2002 requirements to 90kWh 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 an 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 also 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.

Best Practice Design for Social Housing

8. 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, at 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 orientation, topography and existing 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 40%.

Building Energy Rating

9. **We will update the Building Energy Rating Regulations on foot of the Recast EPBD.**

We have rolled out a Building Energy Rating 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 Building Energy Rating (BER). The BER provides information on the dwelling's energy performance and informs rental decisions. The BER certificate is accompanied by an Advisory Report which 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.

The BER provides information on the dwelling's energy performance and can be used to demonstrate improvements over time. The BER Certificate is accompanied by an Advisory Report, with recommendations for further cost effective improvements to the energy performance of building. This encourages householders to improve the energy efficiency of their homes and save money on their energy bills.

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

10. **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; and
- enhance and protect the green infrastructure and biodiversity.

The SEAI is supporting six exemplar community projects will involve 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 saving for homes and business alike, and attracting investment to our secure, sustainable and competitive economy.

NEW ACTIONS

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

Affordable Energy Strategy

11. 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 Departments, Agencies and energy suppliers as well as the Energy Regulator and NGOs. The Affordable Energy Strategy has identified forty-eight short, medium and long-term actions that can be taken to tackle energy poverty and five work streams will be convened 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

12. 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 within 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

13. We will transpose and implement the provisions of the Recast Energy Performance of Buildings Directive (EPBD)

Directive 2010/31/EU on the Energy Performance of Buildings (Recast) was adopted last year. A transposition plan is currently being prepared outlining how additional requirements included in the EPBD Recast will be addressed. For dwellings the main additional requirements to be addressed include:-

- 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 are 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

These and additional matters are being addressed in the transposition plan which will be released for public consultation in April 2012.

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

Directive 2010/31/EU on the Energy Performance of Buildings (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 a building with a high energy performance where the very low amount of energy required should to a very 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.

15. 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 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 exceed the standards of the latest regulations and we are conscious at a public policy level of the importance of maintaining the momentum that has been created in this regard.

Chapter 8: 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.
- Stimulate market actors, such as ESCOs, to deliver cost-effective energy efficiency measures to the market.

Introduction

Better Energy: The National Upgrade Programme

1. **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, thus:

- Deliver energy efficiency upgrades to 1 million residential, public and commercial buildings by 2020, and in the process unlock significant financial savings to homeowners, businesses and the public sector.
- Realise 8,000GWh of energy savings over the lifetime of the programme (2011-2020).
- Improve the energy affordability, health and comfort levels of vulnerable customers within 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 a new 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 one unified and easily identifiable brand with delivery by energy suppliers. The programme will deliver on a major government priority with a focus towards 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, into the domestic, commercial, industrial and public sectors. Thus it will be a multi-annual 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 the 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 Act³² underpins the legislation already in place to allow obligations be placed on energy suppliers.

The new programme will play a major role in achieving our national and European targets, while bridging the existing energy savings gap as identified in NEEAP1. 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 making Ireland a more competitive and environmentally friendly country.

Energy Service Companies (ESCOs)

- 2. 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 aforementioned 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, facilitate EPC procurement, the development of model contracts and budget ring-fencing as appropriate.

³² Energy (Miscellaneous Provisions) Act (No. 3 of 2012)

EPC Market: A Guide to EPC will be published by the SEAI to enable the market to define their offerings and the related business models. In addition 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 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

- 3. 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 is requiring comprehensive consultation with all energy suppliers who will be involved in the scheme.

Fiscal Policy

- 4. We will change behaviour using the pricing mechanisms which 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 existing technologies.

In Budget 2010 introduced a carbon tax at a rate of €15 per tonne was introduced on fossil fuels. The tax was applied to petrol and auto-diesel with effect from midnight, 9 December 2009; and applied from 1 May 2010 to kerosene, marked

gas oil (also known as ‘green diesel’ or ‘agricultural diesel’), liquid petroleum gas (LPG), fuel oil and natural gas. The application of the tax to coal and commercial peat is subject to a Commencement Order.

In Budget 2012 the carbon tax was increased by € from €15 to €20 per tonne. The increase was applied to petrol and auto-diesel with effect from midnight, 7 December 2011 and will apply to the other mineral oils and natural gas from 1 May 2012. The application of the tax to coal and peat remains subject to a Ministerial Commencement order.

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

The yield from the carbon tax in 2011 is expected to be €31.5 million (provisional). The yield from the € increase is estimated to be €80 million in 2012 and around €109 million in a full year. Whilst the focus of this measure is revenue-raising rather than improving the environment it is worthy of note as it will inevitably lead to reductions in energy consumption.

Assuming that **all measures** committed to are still in place then savings of 2.620 GW Hr⁻¹ and 2.684 GW Hr⁻¹ will be realized in 2016 and 2020 respectively. In relation to the carbon tax alone, and assuming it increases to €20 in 2012 and €25 in 2014, the savings amount to 1.838 GW Hr⁻¹ and 1.878 GW Hr⁻¹ respectively.

Energy Taxation Directive

- 5. 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 i.e. 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 which would remove the current flexibility of Member States in setting excise rates.

Environmental Awareness

- 6. 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, the promotion of our climate change schools resource for primary schools - *Eco Detectives* - and

through 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 the elements of the programme are awarded a 'Green-Flag'. Green Schools (Eco-Schools) is co-ordinated on an international level by, FEE (Foundation for Environmental Education).

The Department of the Environment, Community and Local Government provides financial support for the Green Schools Initiative 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 with the number of schools, third-level institutions and education centres registered for the Green-Schools programme being in excess of 3,500 in 2012.

Green Campus Initiative

Following on from 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 placing significant importance on 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 there are 18 Irish Campuses formally registered on the Programme, with three awarded the Green Flag.

Green Business and Green Hospitality

The Green Business and Green Hospitality initiatives which are 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 from 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, which 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 commenced 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

- 7. We will ensure that energy measurement and reporting 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 of programmes and activity across all sectors the ability to generate and analyse energy related data is paramount.

Cross-Departmental Implementation Group

- 8. 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 XX 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.

Annex 01

