



Ireland

DELIVERING OUR GREEN POTENTIAL



Government Policy Statement on
Growth and Employment in the Green Economy



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Growth and Employment in the Green Economy

Government of Ireland, 2012



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FOREWORD BY AN TAOISEACH, ENDA KENNY, T.D.

In the 21st Century, scarcity of fossil fuels, the impact of climate change and the need to fundamentally change the way we use the Earth's finite resources will be key drivers of how we evolve as an economy and as a society.

Over the last twenty years a new global market has developed for "green" technologies and products that take account of the environmental impact of economic growth, are more resource-efficient and reduce costs for businesses and consumers. A global Green Economy has emerged, estimated to be worth \$5 trillion in 2010 and employing in excess of 30 million people world-wide.

As recognised in the Government's Action Plan for Jobs 2012, the Green Economy can be a key driver of economic growth and job creation for Ireland. We already have inherent strengths which we can build upon, including world-class renewable energy resources, our excellence in Research, Development and Innovation, an outstanding natural environment and a cluster of Irish companies that are true world-leaders in green goods and services.

This Policy Statement affirms the Government's commitment to further developing the Green Economy in the years ahead, building on progress already made to maximise the significant employment opportunities it presents. The Statement identifies the opportunities in the Green Economy for sustainable economic growth and job creation, sets out how the Government is supporting the Green Economy and outlines new implementation structures to oversee the development of the sector. It also reaffirms the interdependencies between the Green Economy and the Government's Sustainable Development Framework.

My Government is committed to strengthening Ireland's role in the global Green Economy, by focusing on sustainable economic growth, continuing to create the conditions for enterprise growth and delivering the specific initiatives outlined in this Policy Statement on Growth and Employment in the Green Economy. We hope that industry and the many other interested and engaged stakeholders will work with us to maximise the opportunities arising for Ireland.

Enda Kenny, T.D.
Taoiseach



KEY MESSAGES

The Green Economy is one of the most dynamic and rapidly growing markets in the world and presents a major opportunity for growth, competitiveness and employment creation for Ireland.

The Green Economy is one of the most dynamic and rapidly growing markets in the world. In the strictest sense, it is not a discrete sector. Rather, the term captures a range of activities spread across different sectors which have the common objective of providing goods and services in a sustainable way which reduces the impact on the environment. For Ireland, it covers activities as diverse as renewable energy, energy efficiency, sustainable food production, tourism, “Green” financial services, and energy-efficient products and services. Research and Development (R&D) also has a key role to play in developing the Green Economy.

Key drivers of the growth of the Green Economy globally include emissions reduction targets, increasing fossil fuel prices, diminishing natural resources, the impact of climate change, environmental legislation and consumer preferences.

The economic value of the Green Economy on a global scale was estimated to be \$5 trillion in 2010, employing in excess of 30 million people worldwide. Furthermore, it is a sector that is growing and is projected to increase to the order of \$6 trillion by 2015, an average growth rate of 3.7% per annum.

The Expert Group on Future Skills Needs (EGFSN) estimated that 18,750 were employed in just six sub-sectors of the Green Economy in Ireland in 2010. Many more are employed in the emerging “green” areas within Tourism, Agriculture and other sectors, where sustainable products or services have become key selling points for Ireland. The Green Economy in Ireland is characterised by a small number of large companies, but also a significant number of smaller, innovative companies, many of whom are already active in overseas markets and have built a strong reputation for their expertise.



The EGFSN estimated that up to 10,000 extra jobs could be created in six key sub-sectors of the Green Economy alone by 2015 if substantive progress was made in addressing key policy challenges impacting on the development of these sectors.

The Green Economy presents a major opportunity for growth, competitiveness and employment creation. Ireland has significant strengths and advantages which it can leverage to exploit business opportunities in the Green Economy. Key amongst these are:

- Abundant renewable energy resources, which raise the prospect of Ireland becoming an exporter of clean energy to the UK and continental Europe in the future.
- A strong R&D base, which is highly relevant to a number of Green Economy opportunities.
- Strengths as a location to test and develop new technologies and products for application to larger markets.
- Excellent natural resources such as clean water, air and land to support sustainable economic development.
- An outstanding natural environment and rich biodiversity to develop and support "Green" tourism and related activities.
- Strengths in key enabling technologies such as engineering, ICT and biotechnology.
- A number of exemplar companies and organisations with a proven track record and international credibility in the Green Economy.
- An established international image as a Green Island which can be built upon to promote Ireland's "Green" offering.

The potential exists to develop the domestic market for green goods and services, but also to encourage foreign direct investment and promote exports to a rapidly expanding global market.

The Government already provides many supports to the various sectors making up the Green Economy, and has published a number of strategies to support the further development of those sectors (e.g. Strategy for Renewable Energy, Sustainable Development Framework, National Energy Efficiency Action Plan, *A Resource Opportunity* – the new national waste policy).

This Policy Statement draws on these existing strategies and identifies the economic and employment opportunities that are available for businesses in different sectors that make up the Green Economy. It sets out comprehensively how the Government is supporting the Green Economy in Ireland and affirms the Government's commitment to further developing the area in the years ahead in accordance with the principles of sustainable economic development.

Delivering the individual commitments outlined in this Policy Statement requires a whole-of-Government approach to maximise the growth and employment potential of the Green Economy. The Cabinet Committee on Climate Change and the Green Economy, which is chaired by the Taoiseach, will, therefore, oversee the development of the Green Economy in Ireland.

In addition, the Government will establish a Consultative Committee on the Green Economy, which will be chaired by the Minister for Jobs, Enterprise and Innovation, to identify emerging opportunities for Ireland in the Green Economy. Opportunities identified by the Consultative Committee will be considered with a view to their inclusion in the Action Plan for Jobs in 2013 and subsequent years.



THE GROWTH OF THE GREEN ECONOMY

Driven by the challenges of climate change and scarcity of natural resources, the Green Economy has grown on a global scale and was estimated to be \$5 trillion in 2010, employing in excess of 30 million people world-wide. The sector provides significant opportunities for Irish-based companies to export innovative goods and services and for Ireland to attract growing volumes of foreign investment in the Green Economy.

The last twenty years has seen the gradual emergence of new technologies and practices that are responding to the challenges of climate change and scarcity of natural resources. Renewable energy, electric vehicles and energy saving devices are just some of the products that have become realities in our daily lives. We are only at the start of the transformation process. As public understanding grows of the need to guard the Earth's natural resources, a global and local demand is emerging for "green" goods and services. Businesses are also trying to find ways to reduce costs through greater resource efficiency and energy saving measures. This has spawned the emergence of a "Green Economy" which is one of the fastest-growing markets in the world, employing in excess of 30 million people world-wide.

In the strictest sense, the Green Economy is not a discrete sector. Rather, the term captures a range of activities spread across different sectors which have the common objective of providing goods and services in a sustainable way which reduces the impact on the environment¹. The Green Economy includes commercial activity in areas such as renewable energy, energy-efficient products, resource-efficient production techniques, the re-use, recovery and recycling of waste, water management and low-carbon vehicles. The term "cleantech" is sometimes used when referring to products and services in the Green Economy.

The Green Economy is set to grow steadily in the medium-to-long term, as greater efforts are made to reduce global greenhouse gas emissions, respond to diminishing supplies of fossil fuels and other scarce resources, and adapt to the impact of climate change.

¹ The OECD defines green growth as "fostering economic growth and development, while ensuring natural assets continue to provide the resources and environmental services on which our well-being relies. To do this, it must catalyse investment and innovation which will underpin sustained growth and give rise to new economic opportunities."



Major world economies, including China and the USA, are investing heavily in green products, services and technologies to transform their economies, opening up new market opportunities for innovative companies worldwide who can deliver to those markets. Multi National Companies and international Funds managers also see the Green Economy as an attractive investment, with the sector set to grow significantly and offering attractive returns on investment in the long-term.

OUR STRENGTHS

Ireland is strongly placed to benefit from the growth of the Green Economy. We have a number of strengths which we can leverage to create employment and growth for both indigenous companies and for foreign investments in Ireland. Our natural assets – clean air and water, consistent wind, ocean resources, natural landscape, and rich biodiversity provide a strong platform for the development of the Green Economy that surpasses the potential of many other countries.

This natural environment, coupled with our exceptional research base and a number of leading-edge companies, provides us with extensive opportunities for development of the Green Economy in areas as diverse as renewable energy, sustainable food production, tourism, environmental resource management, “Green” financial services, and resource and energy-efficient products and services.

Other strengths which apply across the whole of the economy include our favourable corporate tax rate, a well-educated adaptable workforce, and an established international image as a Green island which can be built upon to promote Ireland’s Green offering.

Building on our strengths, and supported by a cohesive approach across Government, Ireland can continue to grow its share in international markets for green goods and services.

As well as having the potential to be a key contributor to sustainable economic growth, at the heart of the Green Economy is the imperative to achieve greater sustainability in relation to the use of the finite resources at our disposal. The protection of the environment and the development of the Green Economy are integrally connected. Developing the potential of the Green Economy for

Ireland, therefore, will be done in a complementary and integrated way to the Government’s Framework for Sustainable Development, *Our Sustainable Future*, which was published in 2012.

DRIVERS OF THE GREEN ECONOMY

There are a number of key drivers in the growth of the Green Economy globally, including emissions reduction targets, increasing fossil fuel prices, scarcity of natural resources, the impact of climate change, environmental legislation and consumer preferences.

In a national context, Ireland is committed to achieving a number of EU targets to reduce greenhouse gas emissions, increase energy efficiency and renewable energy, increase the re-use, recovery and recycling of waste, and improve water quality and conservation. For a nation that imports €6 billion of fossil fuels each year, there is a particular imperative for us to reduce our dependence on oil, gas and coal imports which leave the economy vulnerable to costly price fluctuations and security of supply.

The Secretariat to the National Economic and Social Council (NESC) has published an independent interim analysis to inform the development of national policy on climate change. This work provides an additional impetus for moving towards a greener economy and a cleaner environment. The NESC report highlights the fact that certain climate change actions can help in addressing domestic demand and in supporting employment.

Environmental legislation is continuing to raise standards of sustainable production and consumption, while consumer preferences are shifting towards goods and services that are more sustainable and have less impact on the environment. As a result, businesses are seeking improvements in the environmental criteria of goods and services at all levels of the supply chain. Keeping pace with these developments is essential if the Irish economy is to improve its competitiveness and productivity and grow employment.



Developments at EU level

The overriding priority of the Europe 2020 Strategy is to achieve smart, sustainable and inclusive growth. Europe 2020 identifies sustainable growth, or 'green growth', as being central to a resource-efficient future for Europe, creating new green jobs, boosting energy efficiency and assuring energy security. As part of the Europe 2020 Strategy, the Resource Efficiency Flagship aims to support the shift towards a resource-efficient, low-carbon economy by decoupling economic growth from resource and energy use, reducing CO₂ emissions, promoting greater energy security and reducing the resource intensity of what we use and consume.

Developments at EU level will not stop in 2020. The EU has also set out a challenging longer term vision for transforming Europe into a competitive low carbon economy by 2050, in particular by reducing EU greenhouse gas emissions by 80-95% by that date. The European Commission estimates that to achieve an 80% reduction in emissions in the EU by 2050, investment in clean and energy-efficient technologies needs to be increased by 1.5% (around €270 billion) of the EU's GDP per annum.

VALUE OF THE GREEN ECONOMY

Based on these drivers, the Green Economy is set to grow strongly on a global basis. The economic value of the Green Economy on a global scale was estimated to be \$5 trillion in 2010, employing in excess of 30 million people world-wide². It is a sector that is projected to increase to the order of \$6 trillion by 2015³, an average growth rate of 3.7% per annum.

The sector provides significant opportunities for Irish-based companies to export innovative goods and services and also for Ireland to attract growing volumes of foreign investment in the Green Economy, given our strengths and the markets which can easily be served from Ireland.

2 "Cleantech Ireland", Ernst & Young, 2012, citing Innovas Solutions and Kmatrix.

3 Forfas 2011, citing Innovas Solutions



THE GREEN ECONOMY IN IRELAND

The Government is committed to developing the potential of the Green Economy for Ireland. We have resources and strengths that surpass those of many other countries. We will use them wisely to enable the Green Economy to develop in Ireland, with consequent gains for sustainable economic growth, exports and job creation.

The Green Economy is already vibrant in Ireland and the opportunity for its further development is significant, as highlighted in the 2009 Report of the High Level Group on Green Enterprise⁴. New jobs are being created, others sustained and still others diversified as Irish enterprises develop innovative, resource efficient processes, goods and services in this fast expanding global market. Many companies are also engaged in resource and energy efficiency initiatives, with resulting improvements in their cost competitiveness.

Comprehensive data gathering on the Green Economy in Ireland is problematic because of the breadth of the sectors it covers. Nonetheless, the Expert Group on Future Skills Needs (EGFSN) estimated that 18,750 were employed in six key sub-sectors of the Green Economy in 2010⁵. This baseline is a conservative estimate derived from employment in Enterprise Ireland and IDA Ireland client companies, the National Retrofit Programme and large semi-State companies. It does not include other key sectors where Green Economy activity is strongly emerging, such as Financial Services, Agriculture and Marine, and Tourism.

The value of sales of low carbon environmental goods and services in and from Ireland was estimated at €6.8 billion in 2010/11⁶, contributing over 4% to GDP.

A number of Irish companies are to the forefront in developing innovative "cleantech" products in areas such as insulation materials, efficient heating equipment, energy management systems and energy efficient lighting. They have met with

4 "Developing the Green Economy in Ireland", High Level Group on Green Enterprise, 2009

5 These sub-sectors are: Renewable Energies; Efficient Energy Use and Management; Water and Waste Water Treatment; Waste Management, Recovery and Recycling; Environmental Consultancy and Services; and "Green" ICT Applications/ Software.

6 Underlying data for UK Low Carbon Environmental Goods and Services (LCEGS), Dept Business, Innovation and Skills



notable success in exporting their offerings to major international markets in the US and the Middle East. Allied to this, Ireland is at the leading edge in relation to research in a number of areas which complement the Green Economy, including agri-food, ocean energy, smart grids and smart city technologies.

There is considerable potential for future job creation in the Green Economy in Ireland. The EGFSN report from 2010⁷ estimated that up to 10,000 extra jobs could be created in six sub-sectors of the Green Economy alone by 2015 if substantive progress is made in addressing key policy challenges impacting on the development of these sectors.

Importantly, companies in the Green Economy are not concentrated in any one location in Ireland and there is significant potential for on-going regional dispersal of activity as the sector grows.

It is clear that the value of the Green Economy, both globally and nationally, is set to increase significantly over the coming years and Ireland can benefit from this upward trajectory. Indigenous and international investors have shown a strong interest in being part of this important and dynamic sector, which will be an engine for future job creation and economic growth.

GOVERNMENT'S COMMITMENT TO DEVELOPING THE GREEN ECONOMY

The Government is committed to developing the potential of the Green Economy in Ireland to support sustainable economic growth and create jobs. We are already implementing a number of strategies and programmes to support individual sectors in the Green Economy. These include the Strategy for Renewable Energy 2012-2020, the National Energy Efficiency Action Plan, the Framework for Sustainable Development for Ireland, a new National Waste Policy and the Green Public Procurement Action Plan. Further policy approaches are being developed under specific sectoral headings, as outlined in this Policy Statement. Implementing these strategies is an integral part of developing the Green Economy in Ireland.

Appendix 1 summarises the key initiatives across the various sectors that make up the Green Economy in Ireland.

The Government also provides a range of supports to the enterprise sector through its agencies, in particular the Sustainable Energy Authority of Ireland (SEAI), the Environmental Protection Agency (EPA), Enterprise Ireland and IDA Ireland. These supports comprise expert advice to enterprises of all sizes on adopting an environmentally sustainable and resource-efficient approach to their business, and on how to take advantage of the opportunities presented by the increasing demand from consumers and clients for "green" and sustainable products and services. The work of the agencies also enhances the competitiveness of Irish industry and multinational companies based in Ireland by helping reduce costs and usage of energy, water and materials. A range of grants is also available to support business in these areas. Appendix 2 summarises the supports available to businesses in Ireland to develop their "green" offering.

In addition, the Government's continued investment in research and development is building the longer term foundations for continued innovation in green products and services, particularly in energy, marine and agriculture, as recommended by the Research Prioritisation Steering Group.

As set out over the following pages, the Government will develop the potential of the Green Economy across a range of sectors in a way that respects the environment and the biodiversity that underpins our international image as a Green island. We will use our resources and our strengths wisely, with supportive Government policies, to enable the Green Economy to develop in Ireland with consequent gains for our exports and for job creation. We will also continue to work with business across the range of green opportunities to understand and address obstacles to growth and to employment creation, through enhanced delivery structures.

7 Future Skills Needs of Enterprise within the Green Economy in Ireland, EGFSN, 2010



STRUCTURES FOR DELIVERY

The Green Economy in Ireland is highly diversified across a range of sectors. We have key strengths that surpass those of many other countries, which put us in a strong position to capture the economic and employment opportunities afforded by the global growth of the Green Economy.

Responsibility for the development of the “green” potential of individual sectors such as Renewable Energy, Agri-food, Tourism, etc., will continue to be driven by the relevant Government Ministers as part of their policy remit. However, delivering the individual commitments which are outlined in this Policy Statement requires a whole-of-Government approach to maximise the growth and employment potential of the Green Economy. The development of the Green Economy in Ireland will therefore be overseen by the Cabinet Committee on Climate Change and the Green Economy, which is chaired by the Taoiseach.

In addition, the Government will establish a Consultative Committee on the Green Economy, which will be chaired by the Minister for Jobs, Enterprise and Innovation, to identify emerging opportunities for Ireland in the Green Economy. The Consultative Committee will involve representatives from the enterprise sector as well as other key stakeholders, including relevant Government Departments and agencies, as part of its remit. Opportunities identified by the Consultative Committee - as well as enablers and barriers to be addressed - will be examined with a view to their inclusion in the Action Plan for Jobs in 2013 and subsequent years.

The Consultative Committee will dovetail with and complement the Government’s High Level Group on Sustainable Development, ensuring synergy and complementarity between the development of the Green Economy and Sustainable Development.



RENEWABLE ENERGY

Ireland has exceptional renewable energy resources in its wind and oceans. The quality and reliability of these resources compared to other European countries gives us a distinct advantage in developing the potential of this sector.

The development of renewable energy is central to overall energy policy in Ireland. Renewable energy lessens our dependence on fossil fuels, improves security of supply and reduces greenhouse gas emissions.

Ireland has binding EU targets in place to deliver 16% of its overall energy from renewable sources by 2020. Within this overall target, 40% of our electricity will be met from renewables. These targets will be met. However, in the longer-term, it is clear that there will be a significant increase in renewable energy deployment in Europe over and above the 2020 target levels.

Developing the sector will produce environmental benefits for Ireland, and will also contribute to economic growth and employment. For example, the strategic deployment of onshore wind projects can help to develop a base of indigenous and multi-national companies and create employment in areas such as wind farm assembly, manufacturing, services (including ICT) and supply chain opportunities. Ireland can also become a global leader in research, development and testing of renewable energy and related technologies, including Smart Grids.

Ireland has a number of particular strengths to support the development of these areas, including excellent renewable energy resources, engineering and ICT skills, and a strong R&D base.

In May 2012, the Government published its Strategy for Renewable Energy 2012-2020, setting out specific actions which it will take to further develop wind energy, ocean energy, bioenergy, R&D, sustainable transport energy, and the supporting energy infrastructure. The delivery of the Strategy for Renewable Energy will be a key element in developing the Green Economy in Ireland and will require a cohesive approach across Government, enterprise and other key stakeholders.



WIND ENERGY

Ireland has exceptional renewable energy resources in its wind. The quality and reliability of Ireland's wind resource compared to other European countries gives us a distinct advantage in developing the potential of this sector.

Our renewable energy resources have the capacity to deliver many multiples of the energy required by the domestic market. This offers potential for Ireland to export electricity generated from renewable sources to the UK and beyond, to help other EU Member States meet their renewable energy targets. It also makes Ireland an attractive location for those interested in researching, testing or investing in renewable energy.

The Government supports the production of domestic wind energy through Renewable Energy Feed-In Tariffs (REFIT) and has a structured process for the further development of wind energy locations and their feed-in to the national electricity grid. Ultimately, renewable electricity generation should, at a future point, be able to function in the market as a fully cost-competitive technology.

The Government is committed to working with the UK Government, under the auspices of the British Irish Council, and with the European Commission and Member States in the context of the North Seas Offshore Grid Initiative, to create the framework and conditions for renewable energy export. A significant development in this regard is the opening of the East West Interconnector with the UK which allows electricity to be traded between the two islands. The Government is committed to continuing the necessary analysis to inform decisions on further potential interconnectors with the UK and with France.

The Government also recognises the possibilities for onshore wind projects of significant scale, which may, in time, offer the potential for export of renewable energy to the UK market directly.

As outlined in the Strategy for Renewable Energy, the Government is committed to reviewing the scope for further streamlining the authorisation and planning processes for renewable energy projects. Provided the Cost Benefit Analysis is positive, we will put in place the necessary legal, planning and infrastructure framework to support the development of onshore and offshore wind as an export opportunity, without cost to the Irish consumer and to the benefit of the economy.

OCEAN ENERGY

The commercial and technical feasibility of wave energy technology still requires a considerable level of research. However, the Government is committed to realising the long term economic potential of Ireland's wave and tidal resources with the objective of introducing ocean energy into the renewables portfolio over time.

Irish projects have been to the forefront in developing some very promising wave technology devices. In capitalising on our significant ocean energy resources, our strong existing company base and our research institutions, Ireland can become a global leader in ocean research and development and in the manufacture and use of ocean energy systems. This could lead to significant export and employment opportunities in the medium-term.

Key supply chain opportunities which will arise in the ocean energy sector include wave/tidal converter technology, foundations and moorings, electrical connection, installation, data management systems and Operation & Management processes.

BIOENERGY

In 2012, the Government announced a REFIT scheme for biomass technologies. This announcement marked an important step in providing certainty for the sector. The REFIT scheme will critically underpin the Bioenergy crops grant programme operated by the Department of Agriculture, Food and the Marine, while the development of Anaerobic Digestion will assist in usefully disposing of agricultural waste products.

The Government will publish a comprehensive National Bioenergy Strategy to underpin the sustainable growth of biomass/biofuel use in the heat sector as well as in power generation and transport. The development of biomass energy will encourage the establishment of new rural enterprises and support job creation in the regions.



GRID DEVELOPMENT

The growth of renewable energy and wind, in particular, requires the modernisation and expansion of the electricity grid. Ireland, in common with many EU Member States, is undertaking significant investment in the transmission system in support of renewable energy as well as in support of regional economic development. In addition to investing in infrastructure, it is necessary to adapt the grid to operate in a “smarter” manner.

A smarter grid involves the use of information and communication technologies in the transmission and distribution systems in order to accommodate large amounts of intermittent renewable energy and to facilitate the management of demand. Countries worldwide are investing huge sums of money to upgrade their grids⁸. This is translating into a significant global business opportunity. Ireland has

important strengths and a potential first-mover advantage through the work of EirGrid in identifying and overcoming the operational challenges inherent in managing high levels of intermittent wind. We also have a large base of multinational and indigenous ICT companies active in this area.

Ireland is also a natural test-bed for the early deployment of the Smart Grid concept, as it has a single electricity market, one transmission system operator (EirGrid) and one distribution system operator (ESB Networks) and a strong underpinning research capacity. This simplifies the speed at which the roll-out of new technologies can be achieved. These factors are combining to create an opportunity for Ireland to gain first mover advantage and become a major research player in Smart Grids. It also affords Irish-based companies opportunities to generate new leading-edge products and services.

To develop the potential of this sector in the Green Economy, the Government will:

- » Implement its Strategy for Renewable Energy through a whole of Government approach, and, in particular, will:
 - > Provide REFIT supports for on-shore wind, small hydro and biomass.
 - > Ensure that, on average, at least 200MW of new renewable generation is being connected per annum to the grid.
 - > Work to overcome the existing obstacles and delays in the GATE processes for renewable energy projects, including environmental, permitting and any emerging regulatory barriers.
 - > Ensure that the regulatory environment for renewable energy projects in the electricity market is appropriate, predictable and in line with EU requirements.
 - > Introduce legislation to provide for a new offshore licensing and permitting regime.
 - > Review the scope for further streamlining authorisation and planning processes for renewable energy projects.
 - > Work with UK to deliver an intergovernmental agreement which will underpin cross-border trade in renewable energy between the two economies.
 - > Work with our partners in the North Seas Offshore Grid Initiative to deliver the framework and infrastructure to support the development of the North Seas trade in offshore wind.
 - > Finalise and publish the Offshore Renewable Energy Development Plan.
 - > Continue to support the development of the electricity grid to facilitate the use of renewable energies and support the development of Smart technologies to underpin the grid investment.
- » Seek out supply chain opportunities for Irish-based companies through Enterprise Ireland.
- » Publish a new National Bioenergy Strategy.
- » Continue to examine the potential for the development of renewable energy technologies, including solar, geothermal and electricity storage.

⁸ For example, the US Electric Power Research Institute estimates the cost of upgrading US utilities alone to be \$165bn over two decades.



ENERGY EFFICIENCY AND RESOURCE EFFICIENCY

Energy efficiency can play a vital role in reducing the cost of energy for business and domestic consumers. It lessens carbon emissions and decreases our dependence on fossil fuels, thereby improving our competitiveness and sustaining jobs. Achieving greater efficiency in resource inputs and minimising waste also improves productivity and reduces costs.

Improving Ireland's energy efficiency is a fundamental part of Ireland's energy policy. The Government has committed to achieving, by 2020, a 20% reduction in energy demand across the whole of the economy through energy efficiency measures.

Energy efficiency can significantly reduce the cost of energy for business and domestic consumers, lessening carbon emissions, decreasing our dependence on fossil fuels and sustaining jobs. For example, it is estimated that most businesses who have not yet addressed the issue of energy efficiency can reduce their costs by 20% for little or no outlay, providing a significant boost to their competitiveness.

Internationally, energy efficiency is recognised as the most cost-effective means of reducing dependence on fossil fuels. In response to global demand to improve energy performance, a number of Irish companies are to the forefront in developing, testing and manufacturing new products that improve energy efficiency, including insulation materials, heat and ground pumps, and innovative energy storage units. Energy management systems also play a key role in improving energy efficiency and this is also an area where Irish companies are at the leading edge.

As demand expands in significant export markets, such as the UK and Europe, Irish companies can capitalise on their competitive strengths in this area by selling new energy efficient products and technologies into those markets. There is also significant scope for employment growth in the retrofitting of residential, commercial and public buildings, both domestically and in overseas markets.



NATIONAL ENERGY EFFICIENCY ACTION PLAN

Ireland's first National Energy Efficiency Action Plan was published in May 2009 and set out 90 actions that are already taking place, or will take place, to achieve the 20% energy efficiency savings in the period to 2020 across the public, business, residential, transport, and energy supply sectors. The savings identified in the first Action Plan represent approximately €1.6 billion in annual energy cost reductions for the economy in 2020.

Since the publication of the first Action Plan, several new policy measures have been taken to strengthen and deepen our energy savings efforts. Moreover, the European Union policy context is evolving, and the publication of an EU Energy 2020 strategy places even greater emphasis on the role of energy efficiency to achieve our 2020 targets.

The Department of Communications, Energy and Natural Resources is currently preparing an updated National Energy Efficiency Action Plan in response to these developments. The new National Energy Efficiency Action Plan will set out the Government's ambitions to deliver further energy savings over the period to 2020.

BUILDINGS

Recognising that Government must lead by example, we are committed to achieving a 33% reduction in public sector energy use by 2020. In addition, the new EU Energy Efficiency Directive contains targets to upgrade the energy efficiency of 3% of Government buildings every year. The Directive will also impose an obligation on energy companies to help their customers save energy through measures such as building insulation and energy efficient appliances.

These targets and objectives will result in significant cost-savings, but they can also generate significant employment opportunities for Irish-based companies by creating demand for high-quality Irish made products in areas such as insulation, heating systems and energy management. The Government's Green Public Procurement Action Plan - *Green Tenders* - (see Section on Green Products and Services) will also support the demand for these goods and services.

In May 2011, the Government launched the Better Energy programme, with the aim of supporting the energy efficiency upgrades of one million homes, businesses and public buildings. Better Energy consolidated three previous energy efficiency and renewable energy programmes: the Home Energy Savings scheme, the Warmer Homes Scheme and the Greener Homes Scheme. Over 200,000 homes have been upgraded with energy efficiency measures to date. The Better Energy scheme supports around 5,500 jobs in the economy and has allowed many construction workers to diversify into this new service. In 2012, the Government will invest €76 million in the Better Energy scheme.

The Programme for Government includes a commitment to introduce a Pay As You Save (PAYS) scheme to replace the Better Energy scheme from 2014. The PAYS scheme will further support households to invest in energy efficiency measures which will yield tangible reductions in their energy bills. The savings generated for homeowners will allow them to finance the cost of the energy efficiency improvements. The Government will also examine the potential for a strand of the PAYS scheme to support the commercial and public sectors in energy efficiency measures from 2013.

INDUSTRY

Energy efficiency and the development of innovative solutions to energy challenges is of critical importance for all companies. Government agencies, notably the Sustainable Energy Authority of Ireland (SEAI), the Environmental Protection Agency (EPA) and Enterprise Ireland, are working with businesses of all sizes to enable them to be more competitive through increased energy efficiency and the development of innovative energy solutions.

The supports provided by the agencies range from the provision of expert advice and assistance through to grants for research, development and innovation. The Government also provides an Accelerated Capital Allowance scheme, which provides tax incentives to companies that purchase energy-efficient equipment.



SMART METERS

“Smart” meters will have an important role to play in helping both homes and industry to manage their energy consumption more efficiently. Smart meters are the next generation of electricity meters. They work by monitoring and recording the amount of electricity used and when it is used, capturing patterns of energy usage throughout the day. In turn, householders learn how much energy they are using for different appliances and how to reduce costs.

In collaboration with the Commission for Energy Regulation (CER) and the SEAI, the ESB conducted a pilot programme on the use of domestic Smart Meters during 2009 and 2010, with over 5,000 Irish homes and businesses participating. The purpose of the trials was to assess the performance of Smart Meters, their impact on customers’ electricity consumption and the economic case for a wider national rollout. The results of the Smart Meter Trials published by the CER in May 2012 indicated that Irish customers responded very positively to Smart Meters, reducing their electricity consumption and bills.

RESOURCE EFFICIENCY

Resource efficiency means using the Earth’s limited resources in a sustainable manner. We depend on natural resources for our survival but they are also vital inputs to keep our economy functioning. Increased resource efficiency improves productivity, drives down costs and boosts competitiveness. It is a key component in the EU’s Europe 2020 Strategy to achieve smart, sustainable and inclusive growth.

To improve resource efficiency, we need to develop new products and services and find new ways to reduce inputs, minimise waste and improve production processes.

Resource efficiency will help stimulate technological innovation, boost employment in the fast developing ‘green technology’ sector, open up new export markets and benefit consumers through more sustainable products.

The SEAI, the EPA, Enterprise Ireland and IDA Ireland provide a range of supports for business and institutions in the development and implementation of resource-efficient practices. Support and assistance is tailored to each client, whether a large or small enterprise, a multi-national or a public institution.

To develop the potential of this sector in the Green Economy, the Government will:

- » Publish a second National Energy Efficiency Action Plan.
- » Continue to support energy efficiency improvements in homes through the Better Energy scheme up to the end of 2013.
- » Introduce a Pay As You Save (PAYS) scheme to replace the Better Energy Homes scheme from 2014, and a strand of the PAYS scheme to improve energy efficiency in the public and commercial sectors in 2013.
- » Raise public awareness of the benefits of improved energy efficiency through advertising campaigns.
- » Continue to provide supports to business to improve their energy and resource efficiency and manage their costs through the SEAI, EPA and Enterprise Ireland.
- » Introduce an Energy Framework for the Public Service which will further improve the level of energy consumption by the sector.
- » Continue research into energy efficiency measures as set out in the R,D & I Section of this Policy Statement.



GREEN PRODUCTS AND SERVICES

The global demand for new products, services, technologies and solutions in the Green Economy provides significant employment opportunities for Ireland. A large number of Irish companies are developing innovative products which are finding markets in the Green Economy. Many of these companies are already successfully exporting their green goods and services overseas, and employ over 6,000 people in the process.

The high cost of energy, the finite supply of traditional raw materials and clean water, the setting of international emissions reduction targets, and the increasing demand from consumers for sustainable goods, are all driving a global demand for new products, services, technologies and solutions in the Green Economy.

Governments in key export markets for Ireland, such as the UK and France, are developing policies to drive improved energy efficiency. Some countries have introduced environmentally-related taxes such as carbon levies which, along with the EU Emissions Trading Scheme, are encouraging industry to become more resource and energy efficient.

Companies world-wide are also becoming increasingly aware of the financial savings and competitive advantage that arise from adopting an environmentally sustainable and resource-efficient approach to their business. These advantages include lower overhead costs for materials, energy, water, and waste management, and enhanced corporate profile in the community.

All of these factors are opening commercial opportunities for companies that can supply businesses and economies with resource-efficient solutions and products. It is an area that provides significant employment opportunities for Ireland. A large number of Irish companies are developing innovative products which are finding markets in the Green Economy. Many of these companies are successfully exporting their green goods and services overseas. Enterprise Ireland alone has a directory of 240 export-oriented Cleantech companies, employing almost 6,000 people, on its website⁹.

9 See <http://www.enterprise-ireland.com/en/Source-a-Product-or-Service-from-Ireland/Sector-and-Company-Directories/CleanTech-Directory-Aug-2010.pdf>



These products and services include energy efficiency equipment and materials such as insulation, thermal efficient glazing, lighting solutions, “intelligent” heating controls, energy meters, and related services such as data management, analytics and maintenance.

Other areas that offer potential for Irish companies include technologies such as solar panels, ground source heat pumps, small scale wind turbines, as well as services such as design, engineering, installation, Operations & Management, and monitoring of energy efficiency. In addition, there are significant commercial opportunities for businesses in the areas of water conservation, and waste re-use, recovery and recycling.

Green Tenders, the Government’s Green Public Procurement Action Plan (see below), the Better Energy retrofitting scheme and the forthcoming roll out of the domestic water metering programme will support the further development of green products and services and related jobs. There is also an opportunity for Ireland to develop a number of demonstration sites for new products and services through these programmes, which can attract multi-national partners, be commercialised and exported by innovative Irish companies.

GREEN PUBLIC PROCUREMENT

Public bodies are major consumers of goods and services, spending some €14 billion annually through their procurement budgets. This represents 10% to 12% of Ireland’s GDP.

Given the scale of the State’s overall expenditure on public procurement, the choices which public bodies make in selecting goods and services can have a positive impact in stimulating demand for green products and services in Ireland and in supporting jobs. By choosing products and services which have reduced environmental impacts, public bodies can make an important contribution to promoting a market for sustainable offerings.

“Green” Public Procurement can be a major driver for innovation, providing industry with real incentives to develop green products and services – particularly in sectors where public purchasers represent a large share of the market, such as construction, health services and public transport.

The Government’s Action Plan on Green Public Procurement - *Green Tenders* - which was published in 2012, provides the framework for the procurement of more sustainable goods and services in eight priority areas. Irish firms have strengths in a number of the key priority areas, such as Construction, Energy, Food and ICT. There is a significant opportunity for Irish firms to innovate and, through winning tenders in Ireland, generate knock-on opportunities in global export markets.

The integration of green principles into public procurement will further enhance Ireland’s reputation as an innovative, eco-efficient, and forward-looking place to do business and will complement the Government’s wider sustainable development objectives.

GREEN CLUSTERS

The growth of the Green Economy on a global scale over the last decade or so has seen the emergence in a number of countries of clusters involving enterprises and institutions with common objectives in relation to the Green Economy.

The concept of clusters is well established in Ireland. Ireland already has internationally successful clusters in the areas of biopharma, medical devices, ICT and financial services. A number of clusters have also emerged in relation to the Green Economy.

These clusters provide opportunities for collaboration between a range of parties with the knowledge, expertise and experience to maximise the development of opportunities in the Green Economy. They serve to stimulate private sector innovation and investment and can act as test beds for new products and services in areas such as renewable energy, energy and resource efficiency and other cleantech activities.

Clusters also have the potential to forge international links with like-minded parties abroad and to access new markets for Irish goods, services and research opportunities, as well as to attract foreign direct investment. The establishment of these clusters can therefore help position Ireland as a global innovative clean-tech hub, attracting high quality jobs to Ireland and creating a vibrant community of innovative businesses.



The Government currently supports a number of green clusters through the involvement of State bodies. Examples of green clusters in Ireland include:

The Green Way

The Green Way is a Cleantech cluster established by industry, academic institutions and public/semi-state players in the Dublin region. Its vision is to create jobs and unlock trade opportunities for companies through the activation and development of an internationally recognised Cleantech cluster.

The partners in The Green Way include Dublin City Council, Fingal County Council, Dublin City University, Dublin Institute of Technology, the Dublin Airport Authority, North Dublin Chamber and Ballymun Regeneration Ltd.

The Government is facilitating the development by Dublin City University of a vacant site in Glasnevin into an internationally-recognised "Innovation Campus", involving a partnership of education and research institutions, enterprise and the Semi-State sector, with a particular focus on research-active Cleantech firms.

Limerick Cleantech

The Limerick Cleantech proposal aims to develop a cluster of sustainable energy-related businesses in the Limerick Region through the creation of a Cleantech Centre in Limerick. Partners include the Limerick Enterprise Development Partnership, the Limerick Combined Local Authorities, University of Limerick and Limerick Institute of Technology, as well as the private sector and enterprise development agencies.

Similar clusters are emerging in other areas of the country.

To develop the potential of this sector in the Green Economy, the Government will:

- » Work with the Consultative Committee on the Green Economy (see "Structures for Delivery") to identify the further employment potential for green goods and services.
- » Through Enterprise Ireland, continue to work with indigenous companies to identify and develop export opportunities for green goods and services.
- » Fully implement *Green Tenders*, the Government's Action Plan on Green Public Procurement, to support the purchase of green goods and services by the Irish public sector and stimulate demand for such products and services in the wider economy.
- » Highlight, publicise and make industry aware of the competitiveness and market gains from green economy actions such as resource and energy efficiency.
- » Continue to support the process of building internationally recognised Green clusters in Ireland through the involvement of the relevant Departments of State and/or their agencies, where appropriate.
- » Facilitate the development by Dublin City University of a site in Glasnevin into an internationally recognised "Innovation Campus", involving a partnership of education and research institutions, enterprise and the Semi-State sector, with a particular focus on research-active Cleantech firms.



GREEN FINANCIAL SERVICES

Building on the success of the Irish Financial Services Centre (IFSC) in Dublin, Ireland has all the ingredients to emerge as a global leader in green financial services. Green assets under management in Ireland doubled in the last year and tripled in the past four. The Government's Strategy for Ireland's International Financial Services Centre 2011-2016 commits to developing Ireland as a centre of excellence in green finance, creating an industry-led "Green IFSC".

Green financial services refer to capital markets, investment banking activities and related advisory services which support the development, financing and promotion of a low carbon economy.

The emergence of the Green Economy offers the potential for long-term growth for companies that can provide solutions to important global issues such as carbon reduction, energy management, resource efficiency etc. This, in turn, has led to a significant interest by investors in companies involved in the field of renewable energy, energy efficiency, green IT systems, sustainable agriculture and water projects.

While managing the ongoing global financial crisis is a challenge for most Governments, investment in Green companies and technologies is strong. Global investment in renewable power generation alone is now running annually in excess of US\$200 billion. Investment in the Green Economy sector as a whole is predicted to grow fourfold to over \$1 trillion by 2020. Such investors include pension funds, life assurance funds, large corporates and high net-worth individuals.

Building on the success of the Irish Financial Services Centre (IFSC) in Dublin, Ireland has all the ingredients to emerge as a global leader in green financial services. We have one of the most sophisticated investment management industries globally, with expertise in fund servicing, administration and asset management. At present, Ireland services more than €2 trillion in assets in its funds industry and this figure is growing rapidly.

We have unrivalled expertise, with some 12,000 professionals employed by over 60 world class service providers servicing investment funds.



International fund promoters are attracted to Ireland due to its open, transparent and well regulated investment environment, its strong emphasis on investor protection, its efficient tax structure, and dynamic and innovative business culture.

Ireland is already growing a world-class green financial management hub. Green assets under management in Ireland doubled in the last year and tripled in the past four. Ireland now manages or services more than \$10 billion in green assets.

The Government's Strategy for Ireland's International Financial Services Centre 2011-2016 commits to developing Ireland as a centre of excellence in green finance, creating an industry-led "Green IFSC". Recent Finance Acts introduced a number of taxation measures to support the development of Green Financial Services.

In addition, IDA Ireland will continue to work to attract green financial services to Ireland. We are already seeing a trend of such funds establishing operations in Ireland and all indications would suggest that the scale of this activity will increase considerably in the short to medium term.

It is important, also, to encourage investment in indigenous cleantech enterprises that have the potential to develop or increase exports of their products or solutions. At present, there is no Venture Capital scheme in Ireland targeted at Green Economy companies. Recognising the potential of the Green Economy, the Government will examine the scope for Venture Capital to support companies in the sector in designing a new Seed and Venture Capital scheme to operate post-2012.

To develop the potential of this sector in the Green Economy, the Government will:

- » Develop and market Ireland as a centre of excellence in green financial services.
- » Continue to attract green financial services to Ireland through IDA Ireland.
- » Examine the potential for Venture Capital to support companies in the sector when designing a new Seed and Venture Capital scheme to operate post-2012.



AGRICULTURE, MARINE AND FORESTRY

Ireland is in an enviable position to produce the type of food that a growing number of consumers are demanding in relation to high quality sustainable food production and environmental standards. Our Dairy industry has the lowest carbon footprint in Europe, while our beef production is one of the most carbon-efficient in the world. Our vibrant Forestry industry has the potential to create jobs and growth through diversification into the new products and services that are being demanded in the emerging Green Economy.

Newly emerged economies such as Brazil, Russia, India and China, are seeing the development of sophisticated new consumer bases seeking new and diverse food choices. In the more mature EU and US markets, consumers are increasingly seeking and paying a premium for foods with clear and credible health, wellness and sustainability attributes. Consumers who demand the highest quality in food production and environmental standards expect clear visibility on sustainability issues and, crucially, are willing to pay a premium for this. Large retail outlets are also demanding that their food suppliers demonstrate the principles of sustainability and traceability in their food products.

Ireland is at an enviable starting point to produce the type of food that a growing number of consumers are demanding and to capture the added value generated by this shift in demand. Ireland's extensive, low-input, grass-based production systems are the foundation of our green credentials, while fish farming in Ireland, although a much more recent undertaking, has also shown considerable determination to minimise its negative environmental impacts. Recent research shows our dairy industry has the lowest carbon footprint in Europe, while our beef production is one of the most carbon-efficient in the world¹⁰. Ireland's historic association with the colour green also represents a natural marketing opportunity for Irish agri-food to build on.

Ireland's climate and natural environment provides us with an advantage in the agriculture and aquaculture sectors that is the envy of the world. We have abundant fertile land, clean inland waterways, and miles of coastline all situated in

10 Evaluation of the livestock sector's contribution to the EU greenhouse gas emissions (GGELS), European Commission JRC 2010



close proximity to a single market of 400 million people. Agri-food and fisheries is Ireland's largest indigenous industry employing some 139,000 people with an annual output of over €22 billion. Reflecting our production capacity, we export 85% of the food we produce and more than 70% of the sector's expenditure is on Irish goods and services.

Ireland is home to several world-class food and drinks companies, and to hundreds of food artisans. We enjoy a strong and enduring international reputation as a source of natural, high quality food, drink and ingredients.

FOOD HARVEST 2020

The industry-developed strategy for the food sector, Food Harvest 2020, maps the future direction of the agri-food and drinks sector for Ireland for the next decade and points to the challenges and opportunities that lie ahead. Significant opportunities for the sector will arise from 2015 with the reform of the Common Agriculture Policy, which will allow for increases in milk production across the EU. The Government is conscious of the need to capture these opportunities in a sustainable way that minimises the impact on land use and greenhouse gas emissions. Therefore, research, development and innovation will play a central role in the growth of the sector.

The Government invests in research, through Teagasc, to validate the environmental and nutritional benefits of grass-fed production, as well as to define the critical consumer aspects of sustainability and to support sustainability improvements such as reducing total greenhouse gas emissions from the agriculture and food sectors. Investments are made to ensure that all Irish food is 100% traceable so that a customer can establish the source of their meals.

The opportunities for naturally produced Irish food and drink products are considerable, provided the industry remains competitive and committed to robust and best-in-class environmental protection. Producers must look at using new and emerging systems of sustainable production, while recognising that increasing economies of scale and production efficiency are central to reducing cost.

Through sustained investment, a collaborative interdisciplinary approach and focused marketing, Ireland can become synonymous with the production of environmentally sustainable value-added products.

There is also huge potential to export Ireland's expertise in relation to sustainable food production, including innovative agricultural goods and services, to developing and emerging economies.

ORIGIN GREEN

In 2011, Bord Bia introduced carbon footprint monitoring for all Bord Bia Quality Assured Beef farms. To date, this is the only such programme in the world that operates on a national basis and commits to actively measuring and reducing the carbon footprint of each producer. A similar national scheme for the dairy industry was piloted in 2011 and will be rolled-out in 2012.

Building on these initiatives, Bord Bia launched the 'Origin Green' programme in 2012. This programme involves manufacturers setting targets in areas such as energy, waste, water, biodiversity and corporate social responsibility activities, minimising their overall carbon footprint and lessening their impact on the environment. In doing so, the industry will also increase its overall efficiency and competitiveness. The objective is to have 75% of Irish food and drink exports sourced from Origin Green members by the end of 2014, and to progress membership levels in the future.

The ultimate aim is the creation of a significant point of differentiation for the Irish food and drinks industry around the area of sustainability. This should result in consumers in key markets recognising implicitly that, by buying Irish, they are choosing to value and respect the natural environment.

OUR OCEAN WEALTH

The Government plans to double the value of Ireland's ocean wealth to 2.4% of GDP by 2030 and increase the turnover from our ocean economy to exceed €6.4 billion by 2020. The plan for the sector, *'Harnessing Our Ocean Wealth - An Integrated Marine Plan for Ireland'* presents a roadmap for the Government's vision to tap into a €1.2 trillion global market for seafood, tourism, renewable ocean energy and new applications for health, medicine and technology. It sets out three high-level goals to achieve a thriving maritime economy, healthy ecosystems, and to increase our engagement with the sea.

FORESTRY

Forests are central to our future Green Economy. They supply our wood and timber industry, provide employment, biodiversity and recreation; they capture carbon and are an important renewable energy resource.

Over 10% of Ireland is under forest, supporting a vibrant export-oriented forest products sector. The capacity to grow the sector significantly will be addressed in the forthcoming Forestry Policy Review. A vibrant forestry industry has the potential to create jobs and growth through diversification into the new products and services that are being demanded in the emerging Green Economy. The private sector will be key partners in the expansion of the sector and the Government will create a strong regulatory framework to ensure a sustainable long term basis for sector in the decades to come.

In terms of products, wood, continues to grow in importance as a source of renewable energy, and will play an important part in meeting the Government's targets for renewable energy. The REFIT 3 scheme launched in 2012 will support increased take-on of Biomass generated electricity to the Irish grid. Programmes such as Better Energy Homes and Better Energy Workplaces have also generated interest in using biomass-heating fuels and new opportunities and market outlets are emerging as more businesses and households switch to biomass heating systems.

In forestry as in other sectors, Irish companies are emerging as global leaders by combining ICT and forest management to generate new opportunities for the export of forestry services using the latest technologies.

To develop the potential of this sector in the Green Economy, the Government will:

- » Support the principles of a sustainable approach to agriculture, as set out in Food Harvest 2020, in particular by:
 - > Prioritising environmental protection
 - > Capitalising on our natural resources and advantages
 - > Conserving biodiversity
 - > Building environmental credibility through research
 - > Improving sustainability across the supply chain
- » Differentiate the Irish food and drink industry around the area of sustainability through the Origin Green programme.
- » Actively improve inter-agency policy coherence to ensure a common approach on environmental sustainability issues, building on existing examples of cooperation.
- » As part of the integrated Marine Plan for Ireland, develop an enterprise strategy to generate momentum in specific emerging market opportunities in areas such as offshore renewable energy services, ICT and sensors and biotechnology.
- » Develop an integrated approach to marine and coastal planning and licensing to address deficiencies in the current planning and licensing system, and develop a Marine Spatial Planning Framework for Ireland.
- » Support the protection of our marine environment to provide a sustainable basis for the maritime economy, through implementation and compliance with environmental legislation.
- » Conduct and publish a review of Forestry Policy in Ireland.



TOURISM

A growing interest in responsible tourism is providing new opportunities for Ireland's tourism sector, which is built on the richness of our landscape and our natural resources. Businesses looking for venues to host international conferences will also find Ireland can offer exceptional venues with "Green" credentials.

The tourism sector is an integral part of Ireland's Green Economy. Our tourism industry is built on our natural heritage and the richness of our natural resources. Time and again our visitors tell us that they come to Ireland for the natural scenery and environment, and it is upon this natural asset that tourism depends to sustain and grow jobs. With more and more people living in urban areas around the world, the appeal of Ireland's rural and green tourist experience is likely to increase in response to a greater desire to 'get away from it all' and reconnect with a more natural rhythm and pace of life.

While Ireland's Green tourism proposition is central to our attractiveness as a destination, like other key economic sectors, it has had to respond with innovation and entrepreneurship, creating new products and services to enhance visitors' experiences. This is essential to ensuring that we continue to attract tourists to Ireland, sustaining and creating jobs.

Significant investment has been made in tourism infrastructure around the country that capitalises on our natural green asset. As well as a wide network of looped and waymarked walks and our world famous national parks, new infrastructure such as Lough Key Forest Park in Roscommon, the Tralee Bay Wetlands Centre and the Great Western Greenway in Mayo, have a wide appeal nationally and internationally in a market that is increasingly seeking a bona fide nature-based responsible tourism offering.

New niche markets are being targeted, such as nature-based responsible tourism and eco-tourism experiences. Ireland has always been an attractive destination for outdoor leisure activities such as walking, golf, fishing and other water-based activities, and is well positioned to benefit from a growing interest in responsible tourism and eco-tourism experiences.



The growth of interest in responsible tourism globally is also providing opportunities for farmers, local businesses and even communities to branch out and diversify into new and innovative niche markets. One example is the Burren Ecotourism Network which is a pilot project bringing together businesses which may not traditionally have been involved in tourism in the area. Working together, these businesses have developed a number of ecotourism packages to offer visitors in the Burren - ranging from farm tours, to food experiences and learn-to experiences. Similar projects are being replicated across the country.

Conventions are an important element of the tourism industry and increasingly, businesses looking for venues to host international conferences are seeking venues with “green” credentials. Ireland has developed a number of such venues in recent years, including the National Convention Centre, Croke Park and the Aviva Stadium. Individual hotels around the country are also demonstrating their green credentials through their involvement in the Green Hospitality Awards programme. Major festivals, such as the Fleadh Ceoil, the Rose of Tralee, the Galway Arts Festival and the Wexford Opera Festival have also adopted a more sustainable approach to the organisation of their festivals.

ACCREDITATION & STANDARDS

Internationally recognised accreditation is key marketing tool for green tourism. Green Hospitality is an Irish organisation, funded

through the Environmental Protection Agency, that is committed to assisting the Hospitality Sector in becoming more environmentally responsible. Green Hospitality has developed a number of programmes that will enable businesses to improve their environmental impact, including the Green Hospitality Awards, Green Restaurants programme and Green Festivals programme. An Eco Tourism label is currently being developed to complement the existing Green Hospitality Awards programme.

The Green Hospitality programme is the only Irish hospitality environmental certification programme that is recognised internationally. It is now recognised as one of the most successful programmes in Europe. It is estimated that members have saved on average €30,000 per annum through improved waste, energy and water consumption as well as more efficient purchasing. Most of the benefits are achieved with low or no cost to business.

A FETAC-recognised Marine and Countryside training programme has also been developed for those working in the tourism activity sector to improve the quality of guiding services provided to visitors. Other accreditation schemes available in the Tourism sector include the Green Tourism Business Scheme, the Eco-certification Programme, EU Flower Eco-label, ISO 14001 (an environmental management standard) and BS8901 (a sustainable event management system).

To develop the potential of this sector in the Green Economy, the Government will:

- » Continue to ensure that Ireland’s rich heritage and natural beauty are promoted to overseas visitors, along with the experiences that our clean, green assets can offer, through Tourism Ireland and its agency and industry partners.
- » Continue to support and develop our outdoor activity-based tourism offering, such as walking, cycling and watersports, which capitalise on Ireland’s natural assets.
- » Continue to support the Tourism sector to tailor their offerings towards more responsible approaches and improved environmental impact through the work of the agencies such as Fáilte Ireland, Environmental Protection Agency and Sustainable Energy Authority of Ireland.
- » Actively promote programmes such as the Green Hospitality Awards, Greener Festivals, and the environmental credentials of our convention facilities.



WASTE MANAGEMENT

Businesses are increasingly aware of the potential to reduce costs and improve competitiveness through reducing waste, either by reducing materials input or through the re-use and recycling of materials. New opportunities are also emerging for waste use through new technologies, for example the production of energy from food waste through anaerobic digestion.

The management of our waste resources is an important factor underpinning the development of the Green Economy in Ireland. Effective management of our waste will help to preserve the environment and enhance our “green” image, which is so important to our tourism and agriculture sectors and in attracting inward investment.

There has been a significant strengthening, over the last 15 years, of public commitment to the principles of prevention, reduction, re-use and recycling of waste. There has also been a growing interest in resource efficiency, especially from businesses trying to reduce their costs and act in a responsible way.

The national municipal waste recovery rate rose from 9% in 1998 to 42% in 2010, while packaging recovery over the same period rose from just under 15% to 74%. Our recovery rates for waste electrical and electronic equipment, at more than 8kg per person, are running at more than double the current statutory target set in EU legislation.

These improvements have been driven by Government through the provision of appropriate waste infrastructure, waste regulation and enforcement, and a range of programmes to support the minimisation, re-use, recovery and recycling of products. These include “Producer Responsibility Initiatives” which have been introduced in the areas of waste electrical and electronic equipment (WEEE), batteries, packaging, end-of-life vehicles, tyres and farm plastics. Along with economic instruments such as the plastic bag and landfill levies, these schemes have contributed to Ireland meeting many of our overall environmental goals and have diverted substantial amounts of waste from landfill.



In spite of these improvements, many challenges remain. The National Waste Report for 2010 identifies that 47% of biodegradable municipal waste was disposed of to landfill. This is material which could be turned into products such as composts, and into energy through technologies such as anaerobic digestion.

There is also a significant challenge in developing reprocessing of recovered waste resources in Ireland, as we have a high level of dependence on export markets for the processing of recycled materials. In 2009, 69% of recovered waste, mainly metals, paper, cardboard and glass, went abroad for recovery. This high level of exports means that opportunities for added value from reprocessing in Ireland are being lost.

Improved management of waste will have an impact on job creation, directly and indirectly. In the first place, the recycling sector is labour intensive and with expanding waste recovery rates, offers opportunities for sustainable jobs if increased reprocessing rates can be achieved in Ireland. There are a number of Irish companies already creating employment in the burgeoning waste recovery sector, as high commodity prices increase the incentive for materials recovery such as plastics

and metals. A five year Market Development Programme (known as rx3) for waste resources was put in place by the Government up to the end of 2013, to facilitate the development of markets for recovered waste resources.

Secondly, businesses are aware of the potential to reduce costs and improve competitiveness through reducing waste, either by reducing materials input or through the re-use and recycling of materials and waste arisings. Innovation in materials usage, upcycling and eco-design can yield significant dividends for companies in reduced costs and enhanced market position. New opportunities are emerging for waste use through new technologies, for example from the agriculture and food sectors, to produce energy.

In July 2012, the Government published a new National Waste Policy - *A Resource Opportunity* - which encompasses measures covering the full spectrum of waste management planning, compliance and enforcement. The policy also provides the certainty that industry requires in order to plan and make investment decisions, thus helping to protect jobs and ensuring that we have a sustainable approach to the management of our waste in the years ahead.

To develop the potential of this sector in the Green Economy, the Government will:

- » Implement in full its new national Waste Policy, including the following key measures:
 - > The introduction of mandatory service standards for household waste collection will progressively increase the degree of segregation of household waste.
 - > A review of the Producer Responsibility Initiatives (PRI) has been initiated to assess and evaluate the operation of the model in Ireland and to make recommendations for future policy in these areas. Future policy will seek to maximise prevention, re-use, recovery and recycling of PRI waste streams in the most economically efficient manner possible.
 - > Awareness and education measures will be strengthened and all Local Authorities will be expected to participate in the Local Authority Waste Prevention Demonstration programme, which provides the skills to develop waste prevention within local communities.
 - > The Government will continue to support the use of recycled material through the Green Public Procurement Action Plan.
 - > A review of recovery infrastructure will be completed by 31 December 2012.
 - > State Agencies such as the EPA, Enterprise Ireland, IDA Ireland and the Sustainable Energy Authority of Ireland will continue to work with businesses to help them to improve their use of resources and management of waste.



WATER MANAGEMENT

The forthcoming domestic water metering programme has the potential to support employment through the installation of water meters and related technologies. It also provides opportunities for the testing, trial and demonstration by Irish firms of new innovative water management technologies which can be exported into the fast-growing international water and waste water markets.

Factors such as climate change, urbanisation and population growth means that the provision of water of sufficient quality is one of the biggest global challenges today. Approximately 70% of the world's water consumption is used for agricultural purposes; a further 20% is used by industry, while the remaining 10% is used in domestic consumption.

Increased drought conditions in parts of the world pose challenges for the capture and supply of scarce water to meet the needs of the various consumers and to support food production. Companies that can offer solutions to these challenges have huge business opportunities in a global market which is currently estimated to be around \$220 billion and having an annual growth rate of 4-5%.¹¹ It is estimated that up to \$22 trillion will be invested in water infrastructure world-wide between 2005 and 2030.

A number of Irish companies have strengths to capture a share of these markets through the provision of improved water efficiency technologies, water purification and storage systems, water treatment products, water quality measurement, advanced water metering technologies and related services such as site surveys, meter installation and maintenance. Irish companies also have significant opportunities to export their services to other parts of the world where major water investment programmes are planned, such as China, Australia and the Middle East.

Ireland has strong research capabilities in key related areas. There is potential to market Ireland as a test-bed site for new water-related technologies, particularly those leveraging Ireland's proven capabilities in ICT, software, communications and sensor technologies.

11 Source: S-Net Water Index. <http://www.snetglobalwaterindexes.com/market.html>



Synergies and enhanced collaboration among national funders in the water area is vital. In this regard, an active research co-ordination group involving ten agencies and Departments was established by the Environmental Protection Agency and Enterprise Ireland in 2010.

Domestically, Ireland is fortunate that it has a plentiful supply of water. However, with a growing population, we must not take the availability and supply of treated water for granted. Clean water supports many industries, including the food and drink sector, tourism, pharmachem and ICT and is a factor in attracting foreign direct investment. As other countries struggle with water supply, we are beginning to better understand the value of clean water in Ireland and the need to conserve it.

The Government has an ongoing commitment to invest significantly in our water infrastructure through the Water Services Investment Programme. In order to improve the quality and availability at the lowest cost to businesses and households, the Government has announced its intention to establish Irish Water as a single State company that will take over the water investment and maintenance programmes of the 34 County and City Councils.

A programme of domestic water metering will also be commenced and will involve the installation of over one million meters in households connected to public water supplies. This programme has the potential to support employment through the installation of water meters and related technologies. Metered water charges will provide households with an incentive to use water resources more efficiently and to reduce their consumption.

The establishment of Irish Water also provides an opportunity for coherence in technological requirements for water investment and greater opportunities for test, trial and demonstration by Irish firms operating in the rapidly growing water and waste water sector.

To develop the potential of this sector in the Green Economy, the Government will:

- » Invest in domestic water services infrastructure and, in particular, the roll out of domestic water meters, which will support employment locally.
- » Continue to help companies to develop and export water services and technologies through Enterprise Ireland.
- » Continue to drive water efficiency in the manufacturing and services sectors, including through programmes offered by the Environmental Protection Agency.



LOW CARBON TRANSPORT

There are opportunities for Ireland to be an early mover in the provision of supporting technologies for electric vehicles in areas such as ICT systems, payment systems, smart energy connection systems and charging infrastructure. Developing these technologies offers a tangible opportunity for Irish firms in the Green Economy.

Transport accounts for more than half of the world's liquid fossil fuel consumption and nearly a quarter of the world's energy-related CO₂ emissions. With the cost of fossil fuels on an upward curve, the world's major economies are looking for low carbon solutions which will improve the energy efficiency and carbon output of the transport sector, especially road transport. On the technological side, low carbon transport encompasses modes of transport such as electric vehicles, hybrid vehicles and electric rail, as well as "intelligent" transport systems which can reduce the environmental impact of the transport network.

In Ireland, the transport sector is a significant fuel consumer and is almost entirely dependent on imported fuel products. We currently import approximately €6 billion of fossil fuels per annum and transport accounts for around one third of this total.

Under EU targets, by 2020, 10% of the energy used in Ireland's transport sector must come from renewable sources. The Government approach to meeting this target is through a combination of biofuels and Electric Vehicles (EVs). We have set an ambitious initial target of 10% of the car fleet, or 230,000 cars, to be electrified by 2020.

EVs are a rapidly developing technology. They have zero tailpipe emissions, they reduce noise pollution and are far more efficient in terms of their energy use than conventional vehicles. It is estimated that EVs could constitute 60% of the passenger car market by 2050.

While it is unlikely that Ireland will have a role in the manufacture of EVs themselves, there are real, tangible opportunities for Ireland to be an early mover in the provision of supporting technologies for EVs. Establishing expertise in areas like ICT systems, payment systems, smart energy connection systems and charging infrastructure offers employment opportunities for Irish companies.



Our strengths in ICT, research and innovation give us a competitive advantage in developing systems that can be exported to the main manufacturers of electric vehicles.

The Government has already introduced a series of supports to stimulate demand for EVs in Ireland, including grant supports and low road tax. There are also Accelerated Capital Allowances available to businesses purchasing EVs.

ESB's eCars leadership has been instrumental in supporting the deployment of EVs in Ireland and in providing a platform for enterprise to develop supporting technologies for the sector. Critical to this support is the national rollout of public smart charging infrastructure on a pilot basis.

A number of Irish companies are involved in the development of EV technologies and services, while IDA Ireland is focused on seeking to secure inward investment from multinational corporations in the electric vehicles sector by leveraging the trialling, test-bedding and demonstration of relevant technologies and services.

Ireland is also involved in a number of EU research projects relating to interoperable EV networks, standardisation of charging, smart charging and customer behaviour.

We will be the first country to trial an electric vehicle IT platform that will facilitate international roaming and seamless charging across Europe.

In the area of intelligent transport systems, Enterprise Ireland is focused on commercialising and internationalising innovative solutions from Irish companies, such as sensors and controls in conventional vehicles, technology to monitor road congestion, and road lighting solutions. Intelligent transport systems allow transport to move and operate more efficiently and is a rapidly growing market internationally. Ireland has a number of advantages in the test-bedding of these new technologies, particularly in terms of size and ICT base, and aided by the top-class research capacity that has been built up primarily through Science Foundation Ireland over the past decade or so. Science Foundation Ireland is also supporting Ireland's energy research capability by participating in collaborative programmes with other European countries, such as a Joint Programming Initiative of relevance to Smarter Cities.

Whilst this technological side of achieving low carbon transport presents the most obvious opportunities for Ireland in terms of economic development, promoting walking, cycling and public transport will also be an important component in supporting the Green Economy.

To develop the potential of this sector in the Green Economy, the Government will:

- » Maintain a suite of incentives for Electric Vehicles.
- » Ensure the continued national roll-out by ESB of the Electric Vehicle recharging infrastructure in the pilot phase, as well as ensuring that an appropriate regulatory and cost recovery framework is put in place for the long term.
- » Continue to identify supply chain and technological support opportunities for indigenous companies emerging from the trialling, test-bedding and demonstration of EV technologies and services.
- » Seek to secure foreign direct investment in the EV sector through IDA Ireland.
- » Continue to invest in Research and Development in relation to technologies for EVs and Intelligent Transport.
- » Pursue in Europe the introduction of the necessary EU wide regulation and standards to underpin the roll-out of vehicle recharging infrastructure throughout the EU.
- » Encourage businesses planning to upgrade their vehicle fleet to consider the benefits of investing in low carbon vehicles.
- » Continue to promote greater use of walking, cycling and public transport in the context of ensuring efficient and sustainable transport of people and goods.



RESEARCH, DEVELOPMENT AND INNOVATION

Constant improvements in technology and products will be at the heart of the Green Economy. The quality of our research base, the innovation of our enterprise sector, and our ideal location for test-bedding will place Ireland at the forefront of breakthroughs in “Green” research, particularly in the area of renewable energy.

Research, Development and Innovation underpins the development of the Green Economy in many of the sectors outlined in this Policy Statement. Constant improvements in technology and products will continue to be at the heart of the Green Economy. Ireland has invested heavily in Research and Development (R&D) in the last decade and as a result of this investment and the quality of our research, we have established a strong reputation internationally in this field.

Science Foundation Ireland (SFI) is focused on funding world-class research in Higher Education Institutions which supports the development of commercial sustainable energy and energy-efficient technologies. Industry partners are also directly involved in several SFI funded energy related research clusters and projects.

Through the Programme for Research in Third-Level Institutions (PRTLII), numerous energy-related research projects are also being supported to further enhance Ireland’s energy capabilities. Under PRTLII, a range of energy initiatives which focus on the development of platform technologies and the delivery of PhD training are being supported across areas such as renewable energy, grid technologies, engineering, the environment and the marine.

In addition, the Government has improved its R&D tax credit offerings for industry to further support activity in energy related research.

Ireland is, furthermore, quite unique in terms of the level of collaboration on R&D between companies who are often competing in the same markets. That capacity to collaborate is a particular strength of Ireland’s R&D offering. It is now Government policy that the majority of future investment in Research, Development and Innovation must be targeted to ensure that Ireland gets the greatest economic return for its investment.



RESEARCH PROJECTS

In relation to the Green Economy, the Government currently supports a number of important research projects through the involvement of State bodies and/or Exchequer funding:

I2E2

The I2E2 Energy Research Centre is a Government sponsored Technology Centre, established to facilitate research which will have a direct impact on industry. The I2E2 research focus is on energy efficiency improvements in factories, plant, equipment and buildings. The innovations will enable the Irish manufacturing industry to improve competitiveness via breakthroughs in energy efficiency and cost reduction.

IMERC

The Irish Maritime and Energy Resource Cluster (IMERC) is a collaboration between multiple entities involving Government Departments, state agencies, higher education institutions and industry partners. IMERC is hosted and led by University College Cork with significant support being provided across Government. IMERC is aimed at using the expertise and experience of researchers, teaching staff and naval personnel on the development of an ecosystem of innovation in the maritime sector. An initial focus is on underpinning Ireland's position as an early leader in the ocean energy sector. Launched in March 2010, specific targets for IMERC are for 70 new research jobs by 2014, five companies incorporated by 2015, and two foreign direct investment clients secured by 2016.

SmartBay

SmartBay Galway is a National Research Test and Demonstration Platform for the development of innovative ICT products and services for the global maritime sector.

Large scale multinationals like IBM and Intel and a host of SMEs are actively involved in research and development initiatives using the SmartBay infrastructure. SmartBay is co-located with the National Test Site for Quarter-scale wave energy converters operated by the Marine Institute and the Sustainable Energy Authority of Ireland. This enables ocean energy developers to utilise the SmartBay infrastructure to validate data and communication systems for device deployment.

International Energy Research Centre

The International Energy Research Centre (IERC) is an industry led, world-leading, collaborative programme of research and innovation in integrated sustainable energy system technologies. IERC brings together international companies and researchers in the field of energy, leveraging research capabilities and technologies to find commercial solutions to the global energy demand challenge.

It is hosted by the Tyndall National Institute in Cork and is supported by the Department of Jobs, Enterprise and Innovation and the Department of Communications, Energy and Natural Resources, working with a co-ordinated agency project team of IDA Ireland, Enterprise Ireland, Science Foundation Ireland and the Sustainable Energy Authority of Ireland.

Belmullet Wave Energy Test Site

The Atlantic Marine Energy Test Site in Belmullet is being developed by the Sustainable Energy Authority of Ireland as a grid-connected test facility for wave - and possibly floating offshore wind - devices at the final stage of test and demonstration. The purpose of the Site is to test the performance of pre-commercial devices in extreme open conditions.

REPORT OF THE RESEARCH PRIORITISATION STEERING GROUP

The Report of the Research Prioritisation Steering Group, published in 2012, identified three key areas that are relevant to developing the Green Economy for Ireland - Sustainable Food Production and Processing, Marine Renewable Energy and Smart Grids & Smart Cities. The Report acknowledged that all of these areas need to be developed in a sustainable manner that will minimise and reduce our impact on our finite natural resources, while also being realised in an economically competitive way.

SUSTAINABLE FOOD PRODUCTION AND PROCESSING

Growth in global population and changing diets in emerging countries are projected to result in a 70% increase in food demand to feed 9 billion people by 2050. Agriculture and fisheries combined are one of Ireland's most important exporting sectors and



there are significant opportunities to increase our output in response to global demand.

However, alongside the need to increase food production is the challenge of doing so in a manner that does not impact on greenhouse gas emissions, water quality, biodiversity or fish stocks. Publicly funded R&D is essential to support the sustainable development of agriculture and the marine sector. The State supports agricultural and seafood research through Teagasc and the Marine Institute. Research centres based in Ireland's Higher Education Institutions are also key partners. In addition, the Marine Functional Foods Research Initiative (NutraMara), a programme for marine-based functional food development, is conducting research into fish processing waste streams and raw materials.

The research funding programmes Research Stimulus Fund (RSF) for agriculture, the Food Institutional Research Measure (FIRM) and the Forestry Research Programme (CoFoRD), which are supported by the Department of Agriculture, Food and the Marine, have also supported the development of research capability, critical mass and capacity in agriculture, food and forestry.

MARINE RENEWABLE ENERGY

The focus of this priority area is to position Ireland as a research, development and innovation hub for the deployment of marine renewable energy technologies and services. On a global basis, there is currently only a small number of pilot scale tidal stream and wave devices that have developed to the level of generating electricity output. The next five years could see a number of technologies reach commercial application and be installed, and Ireland can be an early mover in these developments.

There are a number of collaborative initiatives, most notably Smart Bay and the Quarter-scale Ocean Energy test facility in Galway Bay, which provide testing infrastructure and involve significant multinational ICT companies, SMEs and Higher Education Institutions.

The Marine Institute is working with the Sustainable Energy Authority of Ireland, the Environmental Protection Agency, IDA Ireland and Enterprise Ireland, through the cross agency/industry working group that has been established to develop and drive a Smart Ocean Innovation Cluster for Ireland. The Smart Ocean Strategy specifically seeks to leverage the economic potential of Ireland's marine assets.

One of the major challenges faced by offshore renewable energy is in reducing its costs to be comparable with 'conventional' power generation from gas and coal. In this context, the integration of ICT in the marine environment will become strategically more important with the growth of the marine energy market. This is a key element of the Smart Ocean concept developed by the Marine Institute.

SMART GRIDS & SMART CITIES

Smart Grids and Smart Cities involve the application of energy and advanced ICT technology and solutions to more effectively and efficiently manage complex infrastructure systems. These technologies include advanced sensors, two-way communications and distributed computing.

Smart Electricity Grids involve the use of ICT in the transmission and distribution systems in order to accommodate larger amounts of intermittent renewable energy and to facilitate the management of demand. The existence of a strong research capability in this area, the opportunity presented by the characteristics of Ireland's transmission system, the proximity to EU markets and the presence of several large multinational ICT enterprises with global smart grid ambitions, positions Ireland as a potential test bed for Smart Grid technologies.

The Electricity Research Centre, led by University College Dublin and funded by SFI, is a unique collaboration between academia and major players in the electricity industry undertaking research in areas crucial to the development of sustainable electrical energy systems. A growing number of indigenous companies have also invested in R&D to develop Smart Grid technologies.

Smart Cities is about developing a city's infrastructure, technologies and systems in a way that will reduce consumption and the impact on the environment. Urban planners and local governments have traditionally developed separate solutions for areas such as water, traffic and public transport. By integrating these core systems and using advanced analytic capabilities, city administrators can enhance decision-making, improve urban planning, and provide better and more cost-effective services to citizens. An important development in this regard for Ireland was the establishment of the IBM Smart Cities Technology Centre in Dublin in 2011, which brings together industry and top academic researchers



to focus on advancing science and technology for intelligent and environmentally-friendly urban systems. The SFI-supported Advanced Geotechnologies Strategic Research Cluster, led by the National University of Ireland Maynooth, is also very relevant to the development of smart cities.

OTHER RESEARCH AREAS

Other areas where R&D is relevant to developing the Green Economy include Environmental research, Energy Efficient Buildings and the Bioeconomy.

Environmental research

The Environmental Protection Agency's (EPA) research programme, STRIVE, aims to provide research that supports national and EU policy across a range of areas including air quality, climate change, biodiversity, environmental technologies, environment & health, water quality, waste and resource management, land use, soils and transport. EPA-funded Environmental Technologies and Cleaner Production Research and Innovation projects have enhanced Ireland's ability to meet the main environmental challenges facing the country today and into the future and at the same time have led to the commercialisation and uptake of research outputs.

Smart Building research

Science Foundation Ireland's primary investment in this area is the Strategic Research Cluster for Information and Communication Technology for Optimised Building Operation at UCC.

This is a multi-institutional, interdisciplinary project with researchers from UCC, Cork Institute of

Technology, National University of Ireland Galway, and Tyndall Institute. The focus of the research is the development of a smart building that operates on an energy efficient and user-friendly basis, while reducing its maintenance costs. Industry is actively engaged in the research activity, providing financial support and access to facilities for demonstration.

Bioeconomy

The term "Bioeconomy" encompasses the sustainable production of renewable biological resources and their conversion - and that of waste streams - into feed, food and biobased products such as bioplastics, biofuels and bioenergy. In Ireland, the key elements of the Bioeconomy are the agri-food and fisheries sector, forestry and biopharmaceuticals.

Research and Development have a key role in the development of the Bioeconomy. The Bioeconomy is knowledge-intensive and its development depends critically on on-going research and innovation. Recent surges in scientific knowledge and technical competencies in harnessing biological processes must be developed and transferred for practical application.

Ireland is continuing to invest in Research, Development and Innovation in order to derive the full potential benefits of the Bioeconomy, while minimising the impacts on the built and natural environment. In particular, investment in the public research institutions such as Teagasc and the Marine Institute in key priority areas of national comparative advantage is critical.

To underpin the development of the Green Economy, the Government will:

- » Continue to support existing research projects in renewable energy.
- » Prioritise Research and Development in the areas of Sustainable Food Production and Processing, Marine Renewable Energy and Smart Grids & Smart Cities in accordance with the recommendations of the Report of the Research Prioritisation Group.
- » Ensure collaboration and co-operation across all relevant funding and development agencies to facilitate streamlined, joined-up implementation of the actions required to realise priority areas.
- » Develop a strategy for the Bioeconomy in Ireland as part of the development of the Green Economy.



OTHER ENABLERS OF THE GREEN ECONOMY

The Green Economy will increasingly draw on technologies and skills from other sectors, such as ICT and engineering. In order to develop the Green Economy, we must ensure that we address the skills requirements of the sector on an on-going basis. We will also continue to develop and meet recognised standards to underscore the excellence of green goods and services and highlight Ireland's "Green" offering to potential investors.

CONVERGENCE OF TECHNOLOGIES

A significant part of future goods and services in the Green Economy are as yet unknown, but the main driving force behind their development will be enabling technologies such as ICT, engineering and biotechnology. Ireland has strengths across these sectors and they are already playing an important role across the Green Economy.

For example, in energy management, innovative ICT control systems are at the centre of improving energy efficiency. Similarly, Irish companies in the forestry, waste and water sectors (amongst others) are winning export contracts for ICT-driven solutions to measurement and management issues. Engineering skills are central to the development of the renewable energy sector.

There is considerable potential for Ireland to continue to exploit these ICT and engineering strengths by developing so-called soft services in sectors where we have traditionally been technology takers, such as transport. Our strengths in biotechnology will also be a key force in driving developments in the Green Economy as we strive to make better and sustainable use of our natural resources. Biotechnology will be key in developing solutions around water and wastewater, as well as in new industrial technologies.

TALENT AND SKILLS FOR THE GREEN ECONOMY

To ensure that Irish companies maximise the strengths that Ireland possesses in the Green Economy, it is vitally important that training and education programmes are aligned to the opportunities we have set out in this Policy



Statement. Green Economy jobs often rely on specialist knowledge and expertise, especially in the fields of engineering, science, technology and mathematics.

The Expert Group on Future Skills Needs (EGFSN) has looked at the future skills requirements for the Green Economy and has found that key requirements include the development of core business, engineering and ICT skills while additional expertise can be acquired from existing skills (for example, construction) through 'add-on' specialism modules. In its study published in 2010, the EGFSN identified the future skills needs of enterprise to capitalise on the Green Economy in Ireland and proposed a range of measures to ensure that our future skills base will drive sustainable business and employment growth in the sector.

Higher Education Institutions as well as Further Education and Training providers offer a range of courses that address the skills needs of the Green Economy. It is important that the education and training sector and industry work together to remain responsive to emerging skills needs and opportunities. A good example of recent collaboration is the Summit Finuas graduate Certificate in Sustainable Energy Finance in Dublin City University. Springboard, the Government's programme to assist the unemployed to return to work through skills conversion, also identifies the Green Economy as one of the emerging sectors for attention.

FAS/SOLAS have also introduced green energy courses such as Passive House Building Envelope, Passive House Construction, Rainwater Harvesting, and Domestic Insulation. A FETAC recognised Marine and Countryside training programme has also been developed for those working in the Tourism activity sector which will improved the quality of guiding services to visitors.

ROLE OF STANDARDS

Standards have a role to play in driving growth and jobs in the Green Economy. In Ireland and internationally, our standards are recognized as a badge of excellence. They have become an integral part of private and public purchasing and procurement specifications. Standards can drive innovation in products and services. Achieving standards acts as an effective marketing tool for businesses. By developing expertise ahead of

the rest of the world, Irish industry can seize the opportunity to create and expand markets for green goods and services. Green Economy standards continue to be developed across a range of sectors in Ireland, for example in energy management, hospitality and food production.

The National Standards Authority of Ireland (NSAI) is the Government body with responsibility for developing and publishing Irish Standards and successful new standards arise out of close collaboration between industry, NSAI and the relevant Government agencies.

Compost

A key outcome of the Market Development Programme for recycled goods, rx3, was the development of a new standard for compost products in Ireland (I.S.441:2011). The NSAI developed the new standard which is designed to promote the development of the composting industry and to create markets for compost, as well as providing purchasing guidance for consumers and businesses. This was part of a strategy to help develop markets for organic materials including composts.

Energy Management

A notable success for Ireland in the field of standards is the development of standards for Energy Management.

The Irish Energy Management Standard IS 393 was developed in 2005 by the NSAI in consultation with industry representatives, through the voluntary Large Industry Energy Network (LIEN). The standard was designed so that it could be easily incorporated into existing management activities. IS 393 was one of the first energy management standards in the world. It provided the blueprint for a new European Energy Management Standard, EN 16001. The International Standards Organisation (ISO) has since developed an international standard, ISO 50001, which Ireland had a pivotal role in developing. ISO 50001 is a guidance standard for the implementation, maintenance and improvement of energy management.

As a result, Ireland now has one of the highest take-up of Energy Management Standards in the world, while the LIEN has established itself as one of the world's leading energy efficiency networks. Meanwhile, the Sustainable Energy Authority of Ireland/industry partnership has turned Ireland into



an international leader in energy management. The uptake of the ISO 50001 standard gives a competitive advantage to Irish-based companies, indigenous and multinational, and we have accumulated highly skilled personnel with expertise, experience and know-how on the efficient implementation of energy management systems.

Other sectorally focused initiatives such as the Green Hospitality Award Programme in the Tourism sector, and Origin Green in the food production sector, are contributing to enhancing the competitiveness and sustainability of enterprises in those sectors.

PROTECTING OUR BIODIVERSITY

There is a clear link between the protection of Ireland's biodiversity and the benefit to the economy. Sectors such as agriculture, forestry, tourism, marine fisheries and aquaculture are reliant on the effective conservation and management of natural resources which in turn support employment and local communities. Protecting our biodiversity is also of significant importance to industries that rely on a plentiful supply of clean water, as well as industries in the expanding Bioeconomy.

According to the UN Food and Agriculture Organisation, 40% of the world's economy is based directly and indirectly on the use of biological resources. In 2008, an Irish study, *The Economic and Social Benefits of Biodiversity*¹², valued our national ecosystem services, in terms of their productive output and human utility, at over €2.6 billion per year. This is a conservative estimate, as some important services were not included.

Ireland's National Biodiversity Plan "Actions for Biodiversity 2011-2016" sets out the actions Ireland will take under seven strategic objectives to protect biodiversity and ecosystems services. The implementation of this Plan and its wide-ranging actions will play a key role in protecting our biodiversity and ecosystems.

BRANDING A GREEN IRELAND

Ireland's international image as a Green Island is an excellent starting point in promoting the country's strengths in the Green Economy. However, we must demonstrate the substance of our green credentials by showing our commitment to the principles of sustainable economic development and, in parallel, by actively promoting Ireland's natural resources, skills, talent and expertise in key sectors of the Green Economy. This Policy Statement sets out the areas where Ireland can capitalise on its strengths to capture opportunities in the domestic and international Green Economy markets.

Through the implementation of the Trade, Tourism and Investment Strategy we will highlight Ireland's 'Green' offering to potential investors and we will support Irish businesses through overseas trade missions to find new market opportunities to export innovative products and services that have been developed for the Green Economy.

To underpin the development of the Green Economy, the Government will:

- » Continue to ensure education and training provision is aligned with the skills requirements of the Green Economy, having regard to the findings of the Expert Group on Future Skills Needs. Enterprise and higher education providers should also work together to develop opportunities for structured graduate placements and internships for third level.
- » Actively promote Ireland's "Green" offering to potential investors and support Irish businesses to find new export opportunities for products and services through implementation of the Trade, Tourism and Investment Strategy.
- » Ensure that the value of eco-system services and biodiversity to the economy is captured and monitored so as to ensure sustainable drawdown and protection of these natural assets.



APPENDICES



APPENDIX 1 TIMELINE FOR KEY GREEN ECONOMY INITIATIVES

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2030
Renewable Energy	Strategy for Renewable Energy 2012-2020 being implemented, including export potential									
REFIT 1 Wind, Hydro, Biomass		Deadline for operational commencement	Operational phase	Operational phase (ends 2027 subject to EU Commission clearance)						
REFIT 2 On-shore Wind, Hydro, Biomass (Landfill Gas)		Applications open	Operational phase (2015- 2030)							
REFIT 3 Biomass Technologies		Applications open	Operational phase (2015- 2030)							
Planning for Renewable Energy Projects	Review scope for streamlining of planning for projects	Introduce new foreshore legislation								
Energy Efficiency	National Energy Efficiency Action Plan updated									
	Better Energy Scheme open to 2014	Domestic PAYS scheme								
	Energy Framework for the Public Service introduced 2013									
	PAYS strand for commercial and public sectors 2013									
Water	Development of Irish Water	Domestic water meter installation								
Waste	Reduce biodegradable waste to landfill by 35% by 2016									
	New National Waste Policy									
	Mid-term review 2016									
Agri-food	Food Harvest 2020 being implemented									
	Origin Green Scheme launched	Continue to increase membership								
	Target of 75% food & drink exports from members by 2014									
Marine	<i>Harnessing our Ocean Wealth: An integrated Marine Plan for Ireland</i> being implemented									
Green Public Procurement	<i>Green Tenders</i> – Green Public Procurement Action Plan being implemented									
Sustainable Development & Biodiversity	<i>Our Sustainable Future</i> – A Framework for Sustainable Development in Ireland, 2012-2020 being implemented, underpinning sustainable economic development. National Biodiversity Plan 2011-2016 also supporting natural environment and ecosystems									
Research & Development	Continuing investment in Research, Development and Innovation to underpin other elements of the Green Economy									
Skills and Training	Continuing provision of appropriate skills to meet the needs of the Green Economy									



APPENDIX 2 SUPPORTS FOR THE DEVELOPMENT OF GREEN ENTERPRISES

		Target Enterprises					
	Programme	Multinational Industry	Indigenous Industry	Retail Sector	Hospitality Sector	Commercial & Institutional	
SEAI	Large Industry Network	✓	✓	✓		✓	
	Energy Efficiency Fund	✓	✓	✓	✓	✓	
	Energy Management (Tools and Resources)	✓	✓	✓	✓	✓	
	Accelerated Capital Allowances & Triple E	✓	✓	✓	✓	✓	
	Advice Mentoring & Assessment	✓	✓	✓	✓	✓	
	Cleaner Greener Production Programme	✓	✓	✓	✓	✓	
EPA	Green Business	✓	✓			✓	
	Green Hospitality Award Scheme				✓		
	Local Authority Prevention Network		✓	✓	✓	✓	
	Green Retail			✓			
	R&D support		✓			✓	
	Green Offer (Clean Technology, Environmental Management Systems, Eco-Labeling, Carbon Management)		✓				
EI	Envirocentre.ie	✓	✓	✓	✓	✓	
	R&D support	✓					
	Capital & Training Grant	✓					
	Cleantech Support	✓					

SEAI (Sustainable Energy Authority of Ireland) EPA (Environmental Protection Agency) EI (Enterprise Ireland) IDA (IDA Ireland)



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