County Clare Integrated Strategy

on

Energy & Climate Change

2010 - 2012

Clare County Development Board

October 2010

Acknowledgements

The County Clare Integrated Strategy on Energy & Climate Change was prepared under the Community & Enterprise Directorate of Clare County Council, in consultation with various stakeholders in the county and under the guidance of the Integrated Energy & Climate Change Steering Committee.

The Integrated Energy & Climate Change Steering Committee represents:-

- Clare Accessible Transport
- Clare Chambers of Commerce
- Clare County Council
- Clare Community Forum
- Clare Local Development Company
- Electricity Supply Board
- Irish Farmers Association
- Limerick Clare Energy Agency
- Shannon Development
- Teagasc

The input of everybody that contributed during the consultation process and the development of the Objectives and Action Plan is gratefully acknowledged.

Forward

In 2009, Clare County Development Board carried out a review of its strategy "Shaping the Future" and identified agreed priority areas for the period mid 2009 to end 2012.

Following consultation with the members of the six Implementation Groups / Sub Committees, and two workshops with the Board members it was agreed that a number of strategies would be developed. As a result , the new strategy for the Clare CDB will comprise of a suite of integrated, interagency strategies, focusing on a number of key priority areas as identified by the members. These areas include Social Inclusion, Environment, Rural Development, Tourism, Quality of Life, Climate Change and Energy. A number of integrated inter agency strategies have recently been developed by the Clare CDB and are currently being implemented.

As a result of this process, this strategy, the **County Clare Integrated Strategy on Energy & Climate Change 2010-2012** is one of the strategies developed in response to the priorities identified by the Clare County Development Board.

Similar to the other strategies, a multi agency Steering Committee led by the Limerick Clare Energy Agency was responsible for the development of the strategy. This steering committee represented relevant agencies delivering services on a countywide basis. The Action Plan supporting the Strategy identifies clear objectives with supporting actions, timeframes, and measurable outcomes, with clear responsibility agreed with the most relevant agency for delivering on these actions.

On behalf of the lead agency responsible for developing this action I would like to express my thanks to all those involved in the process for their positivity, commitment and support.

Message From: Chair of Clare County Development Board

This document sets out the importance that County Clare places on its environment and the heritage of renewable energy production. This comes at a time when the country is searching for solutions to many social and economic issues. Ireland's economy is suffering badly in the global recession and County Clare has been affected. The county has also felt the financial affects of climate change during severe flooding and freezing weather last winter. Despite having abundant renewable energy resources the county and country is also heavily dependant upon imported fossil fuels to support our society and economy.

The combined effects of fossil fuel dependence, high CO_2 emissions and increasing costs for fuel will have the affect of arresting the countries and counties ability to create wealth and support our society, as well as continuing to damage our environmental heritage. One solution to this scenario has been identified and is being actively pursued by every country: The Low Carbon Society & Economy. Such an economy is defined by its use of local renewable energy resources. As such the economic activity is underpinned by secure clean energy. The technology to support this economy will also see the creation of skilled job creation and energy that can be exported around the world.

In 1920's the world was in a depression, Europe had ended a bitter world war, but Ireland as a fledgling state was building Europe's largest civil engineering project at Ardnacrusha. This renewable energy project enabled the county and country to become a modern economy, and provided light and power to rural Ireland. Today we are again facing very difficult times, but County Clare is very well placed to play an essential part in enabling Ireland to move to the new Local Carbon Society and Economy.

Councillor Joe Arkins

Cathaoirleach, Clare County Development Board.

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Introduction & Overview

1. Introduction & Overview

County Clare has a long and proud tradition of meeting the countries strategic energy needs. Since 1929 the 89 Mega Watt Ardnacrusha hydro electric plant, corner stone of the Rural Electricification Scheme, to the 915 Mega Watt Money point power station. Then as now the counties intrinsic resources enable the nation to make a quantum leap into a new era. The county is now positioned to make that next leap to the Low Carbon Economy.

Vital elements of the counties position on low carbon energy are:-

- Identification of local needs & potential
- Identification of local contribution to national needs
- Strategic targets to establish the counties ability to meet local & national needs

County Clare has produced a number of examples of Strategic planning, including the County Clare Wood Energy Project and the latest of which is the Clare Wind Energy Strategy. This document sets out to establish a framework within which strategic national and local targets on energy & climate change can be met. The objectives of the strategy are in 5 – main themes, the number of related actions is shown in brackets.

A. Energy Security, Conservation & Efficiency (1,2)
B. Renewable & indigenous energy (3,4,5)
C. Low Carbon Economy – Reduce CO2 Emissions (6,7,8)
D. Research & Development capacity in Alternative Energy (9)
E. Transport energy efficiency, conservation & renewable energy (10)

The objectives and actions agreed to address these themes are detailed in Sections 5 and 6 respectively. Success in attaining these objectives will enable County Clare to meet its goal of being a low carbon economy by 2017.

1.1 The Need for an Energy & Climate Change Strategy

The draft County Development Strategies are being drafted this year in the middle of the Kyoto Period and at a time of global recession. The environmental and socio-economic costs of extreme weather events associated with climate change have already been experienced in County Clare, following the flooding in the winter of 2009 to 2010.

The global recession has been acutely felt in Ireland and County Clare. The county has seen job losses in high value industries, and tourism. Many companies that are experiencing difficulty have cited high energy costs as a significant contributing factor.

1.2 The Low Carbon Society & Economy

The global environmental and socio-economic effects of dependence on fossil fuel energy have been identified as having significant negative effects. Geologists have agreed that the consumption of fossil fuels is close to the rate of production, characterised in the expression “Peak Oil”. All developed countries, including those with large reserves of fossil fuels, are concerned with their economic development being so dependant upon diminishing fossil fuel resources. All of the developed countries have identified a common solution: The Low Carbon Society and Economy. This socio-economic model has been recognised in several European municipalities and regions, especially in the Scandinavian counties. In these countries the abundant natural and indigenous energy resources such as hydro, wood, wind, wave and energy crops, are harnessed to meet the energy needs of the region. This has given the local indigenous Small & Medium Enterprises a distinct marketing advantage, and also attracted large multi national businesses to establish a base in a area of secure low carbon energy resources.

1.3 Definitions

The characteristics of a Low Carbon Economy and Society are being presently formalised. What is clear is that the potential to harness indigenous renewable energy are an essential element.

Strategic Vision & Framework

2. Strategic Vision & Framework

A strategic vision and framework for delivery is essential for the expedient delivery on targets for renewable energy & climate change. The changes required have been set out repeatedly by various international bodies, mot notably the United National Framework

2.1 County Development Plan, 2011 - 2017

The underlying principal and objective of all actions in relation to energy & climate change in county Clare, are based upon the objectives of the County Development Plan 2011 – 2017. the draft objectives pertaining to energy and climate change are tabled below: -

Table 2.1 Clare County Development Plan 2011 - 2017, Climate Change Objectives

(Draft) County Development Plan Objectives:
CDP 9.13 - Climate Change
a) To have regard to the National Climate Change Strategy 2007-2012 and Limerick Clare Climate Change Strategy 2006 and any up dated versions
b) To facilitate measures which seek to establish a low carbon economy and society by 2020.
c) To facilitate measures which seek to reduce emissions of greenhouse gases.
d) To adopt sustainable planning strategies through integrating land use and transportation and by facilitating mixed use developments as a means to reducing greenhouse emissions.

Table 2.2 Clare County Development Plan 2011 - 2017, Energy Objectives

(Draft) County Development Plan Objectives:

CDP 10.1 - Development of Low Carbon Economy

a) To promote County Clare as a low carbon County by 2017 as a means of attracting inward investment to the County and the Mid-West region

b) To facilitate the development of energy sources which will achieve low carbon outputs

CDP 10.2 - Renewable Energy

a) To encourage and to favorably consider proposals for renewable energy developments and ancillary facilities in order to meet National, Regional and County renewable energy targets, and to facilitate a reduction in CO2 emissions and the promotion of a low carbon economy.

b) To support and facilitate the development of new alternatives and technological advances in relation to renewable energy production and storage, that may emerge over the lifetime of the Clare County Development Plan 2011-2017.

c) To prepare a County Renewable Energy Strategy over the lifetime of the Development Plan, which will build on and support the County Wind Energy Strategy and when adopted, the National Renewable Energy Action Plan.

CDP 10.3 - Wind Energy Development

a) To promote and facilitate wind energy production in the County. Proposals for the development of infrastructure for the production and distribution of electricity through the harnessing of wind energy will be determined by reference to the County Wind Energy Strategy.

b) To strike an appropriate balance between facilitating wind energy development and protecting the residential amenity of neighboring property in respect of noise, proliferation and visual impact.

Table 2.2 Clare County Development Plan 2011 - 2017, Energy Objectives

(Draft) County Development Plan Objectives:

CDP 10.4 – Wave / Tidal Energy

To promote and facilitate wave and tidal energy production and to seek to undertake a study during the lifetime of the Plan to investigate ocean/wave energy production in County Clare with a long term objective of facilitating

CDP 10.5 - Hydro-electric Energy

To facilitate the development of appropriately scaled hydroelectric power generation, in particular when developed in combination with other forms of energy infrastructure, such as wind farms.

CDP 10.6 - Bioenergy

To support and encourage the development of the bioenergy sector and facilitate its development for energy production, heat storage and distribution.

CDP 10.7 – Energy Security

To promote and facilitate the achievement of a secure and efficient energy supply and storage for County Clare

CDP 10.8 – Electricity Network

a) To facilitate improvements in energy infrastructure and encourage the expansion of the infrastructure within the County.
b) To facilitate future alternative renewable energy developments and associated utility infrastructure throughout the County.
c) To collaborate with Eirgrid in accordance with the Grid 25 Strategy to facilitate the delivery of quality connection, transmission and market services to electricity generators, suppliers and customers utilizing the high voltage electricity system in County Clare.

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Table 2.2 Clare County Development Plan 2011 - 2017, Energy Objectives

(Draft) County Development Plan Objectives:

CDP 10.8 – Electricity Network (continued)

d) To collaborate with Eirgrid over the lifetime of the Plan to ensure that the County's target of 550MW renewable energy generation is achieved and can be accommodated on the electricity network in County Clare.

CDP 10.9 – District Heating Systems

To facilitate district heating systems in new developments and retrofitting of existing buildings throughout the County.

CDP 10.11 – Gas Network

To facilitate the delivery and expansion of the Natural Gas infrastructure throughout the County and have regard to the location of existing gas infrastructure pipeline in the assessment of planning applications.

CDP 10.12 – Energy Storage

To support and facilitate the development of secure, appropriately scaled, energy storage facilities, particularly pumped freshwater hydro storage, at suitable locations throughout the County.

CDP 10.11 – Energy Efficiency

To reduce the County's dependence on imported fossil fuels and to develop a low carbon economy by:

a) Promoting innovative new building design and retrofitting of existing buildings, that demonstrates a high level of energy conservation, energy efficiency and use of renewable energy sources in accordance with national regulations and policy requirements.

b) Promoting the development and use of alternative energy vehicles in line with national policy the concept of smarter travel and encourage and facilitate the development of ancillary infrastructure.

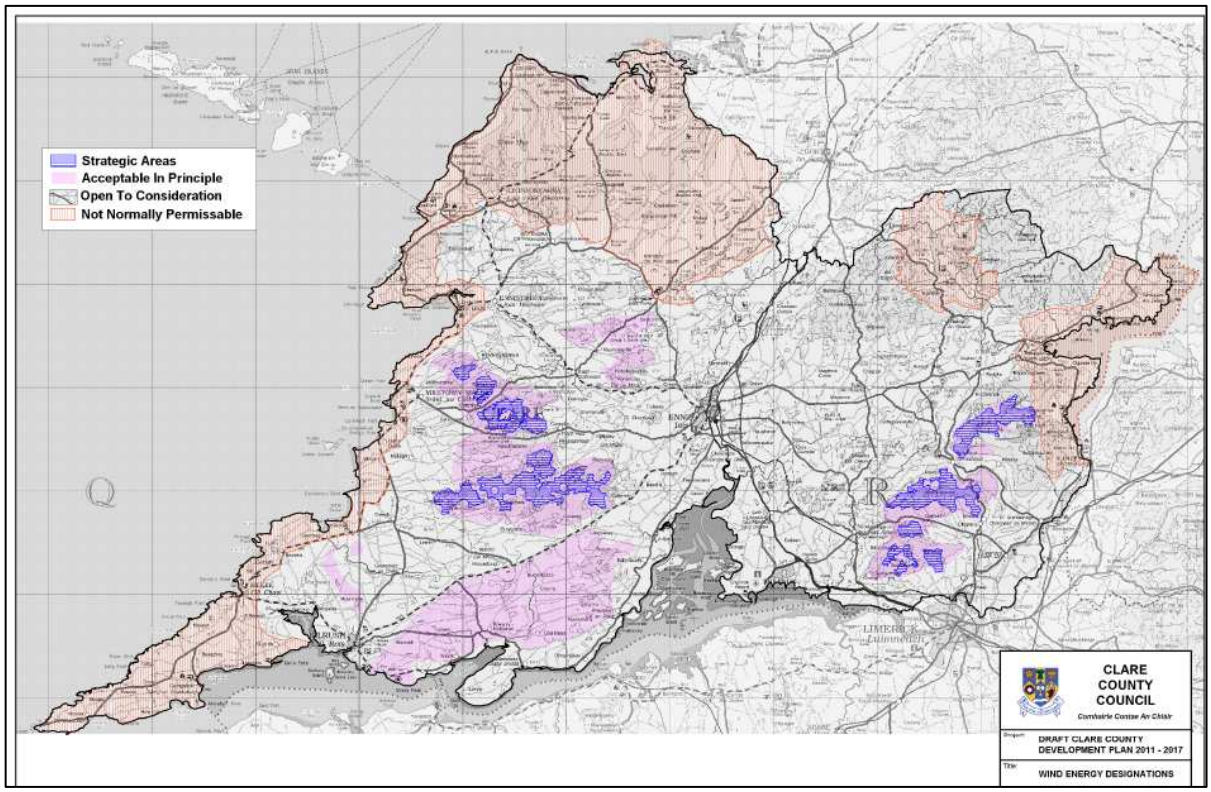
Table 2.2 Clare County Development Plan 2011 - 2017, Energy Objectives

(Draft) County Development Plan Objectives:
CDP 10.12 – Electric Powered Vehicles To facilitate the provision of future installations for powering electric vehicles at appropriate developments.

The direction & development of all economic and social activity flows from the objective stated above. This objective places county Clare at the forefront of the Clean – Green Economy. The ultimate aim is to enable entrepreneurs to generate wealth from secure and sustainable, low carbon indigenous energy

2.2 Clare County Wind Energy Strategy, 2009 - 2011

County Clare has produced Ireland first Wind Energy Strategy. This focused approach to renewable energy development has already been acclaimed nationally and in the European Union.



Source: Draft County Clare Wind Energy Strategy, 2011 - 2017

The principal objectives of the Draft Clare Wind Energy Strategy 2011 – 2017 are given below:-

WES One: Development of Renewable Energy Generation

It is the objective of the Council to support, in principle and in appropriate scales and locations, the development of wind energy resources in County Clare. It is an objective of the Council to ensure the security of energy supply by accommodating the development of wind energy resources in appropriate areas and at appropriate scales within the County.

WES Two: Development of Low Carbon Economy

County Clare will seek to promote itself as moving towards becoming a low carbon County by 2017 as a means of attracting inward investment to the County and the wider Mid West region.

WES Three: County Partnership Approach

Clare County Council will seek to promote wind energy in appropriate sites in the County and will work with agencies such as the Clare County Development Board, Clare Enterprise Board, Limerick Clare Energy Agency, Shannon Development, I.D.A and Enterprise Ireland to encourage investment in research and technology associated with wind farms and other renewable energy technology.

WES Four: Response to National Policy

The White Paper on Energy has set a target of 40% of electricity to be generated from renewable sources by 2020. In the Midwest Regional Climate Change Strategy, County Clare is identified as having a potential 600MW energy produced from renewables by 2020. Clare County Council will aim to achieve a ***minimum target of 550MW*** from wind energy by the conclusion of this Strategy.

WES Five: Promotion of Community Involvement

Clare County Council will seek to promote community involvement and require community benefit where possible in proposed Wind farm developments.

WES Six: Infrastructure Development Proposals

Proposals for the development of infrastructure for the production, storage and distribution of electricity through the harnessing of wind energy will be considered in appropriate sites and locations, subject to relevant policy, legislation and environmental considerations.

2.3 Community, Conservation & Commerce

Several organisations have identified the need to provide a Low Carbon Economy in a manner that protects the global and local environment. It is recognised that many commercial scale projects may entail an initial period of social, economic and environmental disturbance. This initial disruption must be balanced against the long term value of the projects and the contribution they can make to the establishment of secure and low carbon energy resources, thus conserving the socio economic viability of local communities. It will be an important part of the steering committees work to ensure that local communities are appropriately consulted on their community, conservation and commercial needs, with a view to determining how commercial energy projects can be of direct benefit to those local communities as well as the county and country at large.

2.4 Integrated Approach

The measures identified to tackle climate change issues are often intrinsically linked to the need to establish secure indigenous energy resources, based on low or zero carbon fuels. Therefore it makes sense to promote and develop these two complimentary strategies in an integrated manner.

Policy Context

3. Policy Context; Global, European, National, Regional & Local

3.1 Global Policy Context

Climate Change has become one the key international issues resulting in a global effort to influence change, whether through increased exposure by the world media to the climatic effects attributed to climate change or via international gatherings of Governments to negotiate the mechanisms of change. The United Nations (UN) is central to the development and implementation of actions at a global level to reduce green house gas emissions and monitor climate change. The following table summarises some of the most recent actions taken by the Inter-governmental Panel on Climate Change (IPCC) including the United Nations Framework on Climate Change (UNFCC) and the Conference Of Parties (parties to the Kyoto Protocol).

Table 3.1 Timetable of Global Action on Climate Change

Year	***Event***	***Protocol Milestone***
2010	COP 16; CMP 6. Cancun, Mexico	29th November to 10th December
2009	COP 15; CMP 5. Copenhagen	EU increases CO_2 reductions and takes a global lead in climate change.
2007	IPC report on the scientific evidence of Climate Change	World scientists agree that human activity is responsible for the increased rate of global warming
2006	COP 12 and COP/MOP 2 (Nairobi,	Initiate discussions on post Kyoto Agreements
1997	December, COP 3 (Kyoto,	Kyoto Protocol Adapted
1991	First meeting of INC	
1990	IPCC and second WCC call for	
1988	IPCC Established	
1979	First World Climate Conference	

3.2 European Union Context

The European Union has been to the forefront of negotiations on Climate Change, Greenhouse Gas reductions and has agreed internationally binding reductions in Greenhouse gases, to be achieved by 2020.

In addition the EU has identified energy security as a key priority, and has established the 20% targets by 2020:-

- 20% reduction in energy consumption
- 20% reduction in CO_2 emissions
- 20% increase in renewable energy

3.2.1 Kyoto Protocol

The Kyoto Protocol came into legal force in February 2005. The Protocol sets targets for 39 developed countries and the European Union (EU) as a whole. Under the Kyoto Protocol the European Union agreed to an 8% reduction in greenhouse gas emission, based on 1990 data, by 2012. Following the COP meeting in Copenhagen, 2009, The European Union revised its commitment to greenhouse as reduction by increasing the target reduction to 20% reduction on 1990 levels by 2020.

3.2.2 Energy Efficiency & Renewables Energy

The European Union has also been very proactive internationally on the issues of energy security, renewable energy. Some of the key Directives and Polices related to energy and climate change taken since 2005 are:

- EU Directive 2009-28-EC promotion of renewable energy &Mandatory Targets
- EU Directive 2009-30-EC specification on transport fuels, lower ghg
- EU Directive 2009-72-EC rules on internal electricity market
- EU Decision 2009-548-ECl-National Renewable Energy Templates
- COM (2005) 628 final: Biomass Action Plan
- COM (2005) 265 final: Green Paper on Energy Efficiency or Doing More with Less

3.3 National Policy Context

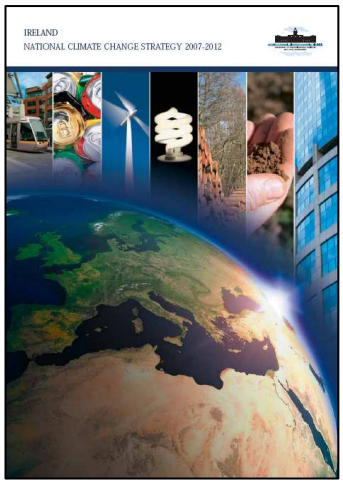
Ireland's main policy documents on Energy & Climate Change are:

- White Paper on Energy 2007
- National Energy Efficiency Action Plan, 2009
- National Renewable Energy Action Plan, 2010
- National Climate Change Strategy, 2007.
- Climate Change Bill, 2010

3.3.1 National Climate Change Strategy, 2007

This document sets out Ireland's target greenhouse gas reductions. The following table summaries the reductions sought:-

	Mt CO_2 equivalent
Emissions without any measures	79.829
Existing measures	8.66
Projected emissions after existing measures	71.169
Less: Kyoto target	63.032
Distance to target	**8.137**
Additional measures	4.953
Flexible mechanisms	3.607
Total additional effect	**8.56**



The reductions by sector are summarised below.

Energy (Ch 3)

- 15% of electricity to be generated from renewable sources by 2010 and 33% by 2020 (increased to 40% in 2010)
- Biomass to contribute up to 30% of energy input at peat stations by 2015
- Support for Combined Heat and Power projects
- National Ocean Energy Strategy

Transport (Ch 4)

- Modal shift to public transport as a result of *Transport 21* investment
- Rebalancing of VRT and motor tax, supported by improved mandatory labelling
- Introduction of biofuels obligation scheme in 2009

- CIE to be required to move to biodiesel blend
- National efficient driving awareness campaign
- Sustainable Transport Action Plan to be published in late 2007
- Support for inclusion of aviation in EU Emissions Trading Scheme

Residential Sector (Chapter 5)

- Revised Building Regulations in 2008 to aim for 40% improvement on current thermal performance standards
- Building Energy Rating certification introduced from 2007
- Grants for renewable energy heating under Greener Homes Scheme
- Levy on incandescent bulbs to encourage shift to low-energy bulbs
- Smart meters to be supplied to all electricity customers
- Energy efficiency measures to be funded in social housing programmes

Business (Chapter 6)

- Building Regulations and Building Energy Rating
- Energy Agreements Programme
- Bioheat and CHP programmes
- Support for eco-efficient technology and practices

Agriculture, Land-use and Forestry Sectors (Chapter 7)

- REPS 4 scheme will support carbon sequestration and reduction of emissions from fertilisers
- Support for improved manure management
- Feasibility of anaerobic digestion to be explored
- Top-up to EU premium for energy crops
- New supports for afforestation
- Biomass Harvesting Scheme

Waste Sector (Chapter 8)

- Use of waste biomass in energy production
- Support for waste-to-energy projects under REFIT scheme

Public Sector (Chapter 9)

- Energy Efficiency Programme with target of 33% energy savings across public sector by 2020

- Biomass heating in schools
- All street lighting and traffic lights required to be energy efficient
- All public sector fleets to be required to move to biofuel blend
- Carbon offsetting of all official air travel

Cross-sectoral (Chapter 10)

- €15m multi-annual Climate Change Awareness campaign
- Examination of incentives and disincentives
- Assessment of potential for domestic offset schemes
- Major funding for research programmes

Adaptation (Chapter 11)

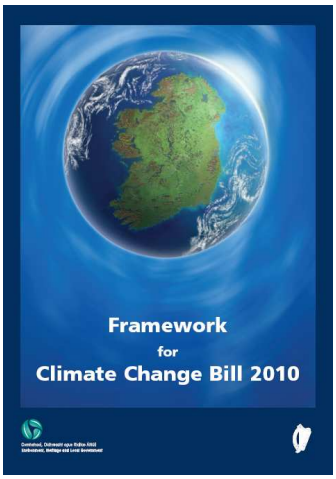
- Flood risk strategy being developed
- Overall national adaptation strategy to be developed by 2009

Implementation and review (Chapter 12)

- Commission on Climate Change to provide high-level advice to Government on progress and to increase awareness in all sectors
- High Level Group on Climate Change to coordinate implementation
- Guidance on cost-benefit appraisal of emission reductions
- Implementation Status Report, including further measures, to be published each year and presented to Joint Oireachtas Committee
- Periodic review by Cabinet Committee
- Third National Climate Change Strategy to focus on post-Kyoto commitments

3.3.2 Climate Change Bill 2010

In addition an ambitious Climate Change Bill 2010 proposes to establish new targets on greenhouse gas emissions together with legislation. The objective of the legislation is to underpin the core national priority of addressing climate change in the pursuit of a sustainable, low carbon economy, while ensuring the maintenance of a vibrant and viable economy in Ireland.



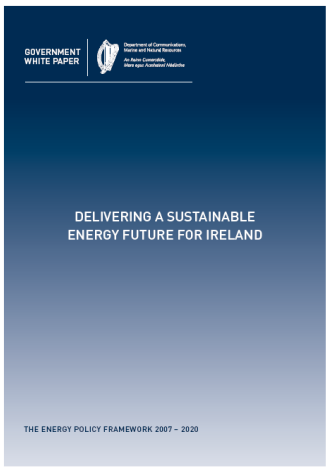
Targets of the Bill

- A 2050 target of at least an 80% reduction in net emissions (on 1990 levels)

- An emissions reduction trajectory of an average of 3% per year until 2020

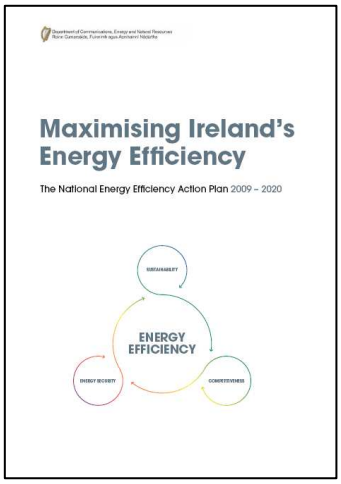
3.3.3 White Paper on Energy, 2007

The White Paper on energy sets out targets for energy efficiency and increased renewable energy. A summary of the targets is given below:-



- Biomass firing at Moneypoint generating station by 2010.
- 30% co-firing of 3 state owned peat plants by 2015, Edenderry immediately.
- 15% of electricity from renewables by 2010.
- 33% of electricity from renewables by 2020. (increased to 40% 2008)
- 400 MW from Combined Heat & Power (CHP) by 2010 Particular emphasis on Biomass.
- 800 MW from Combined Heat & Power (CHP) by 2020.
- 500 MW of installed ocean energy by 2020.
- 5% renewables for heat market by 2010.
- 12% renewables for heat market by 2020.
- 5.75% Biofuels penetration by 2010.
- 10% Biofuels penetration by 2020.
- National Biofuels obligation for fuel suppliers of 5% by 2009.
- 100% Pure Plant Oil (PPO) used in Local Authority & Public Bodies vehicle fleets.
- 20% energy savings on electricity & heat by 2020.
- 30% energy savings on electricity & heat by 2020, indicated if international agreement reached on Post – Kyoto measures.
- 33% electricity & heat savings from Public Sector.
- Promotion of IS 393 Energy Management Standard for SME's.
- Review National Building Regulations (next review 2008).

3.3.4 National Energy Efficiency Action Plan, 2009



The National Energy Efficiency Action Plan sets out to identify the energy and CO2 savings required to enable Ireland to achieve its commitments under the EU Directive 2003 - 739 EC; End-use efficiency and Energy Services (approved 13th December 2005)

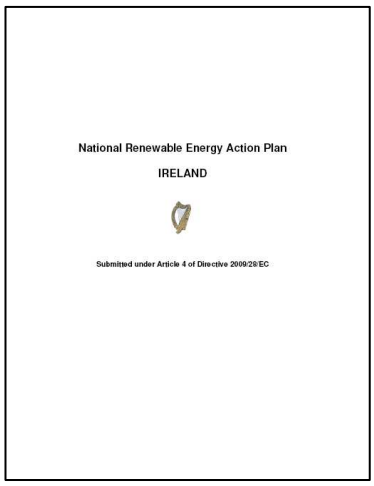
Under this directive Ireland must contribute to Europe's target of 20% reduction of energy consumed by 2020, based on the average consumption during 2001 – 2005, and calculated in primary energy. Thus increases in energy efficiency coupled with fuel switching to low carbon fuels will be very important.

The savings are apportioned to the various economic sectors. The Public Sector is required to make 33% reductions by 2020 and to act as a lead.

Table 3.4 Energy Efficiency Action Plan Target reductions

Sector	NEEAP target[2] 20% - 2020 GWh[3]	NEEAP CO_2 [2] Reduction 2020 kt-CO_2	NEEAP target[2] Sector % %
Public Sector	3,400	856	9.7%
Business	6,480	1,661	18.6%
Residential Sector	18,370	4,928	52.7%
Transport Sector	5,450	1,473	15.6%
Electricity Supply Sector	1,185	595	3.4%
Thermal Supply Sector	-	-	0.0%
Cross Sectoral Actions	-	-	0.0%
Agriculture & Forestry	-	-	0.0%
Research & Development	-	-	0.0%
Totals	***34,885***	***9,513***	**100.0%**

3.3.5 National Renewable Energy Action Plan



The National Renewable Energy Action Plan sets out to identify the renewable energy potential in Ireland and the steps being taken to enable Ireland to achieve its commitments under the EU Directive 2009 - 28 EC; Promotion of Renewable Energy & Mandatory Targets. Under this directive Ireland must contribute to Europe's target of 20% of energy production from renewable resources by 2020, based on the average consumption during 2001 – 2005 and calculated in primary energy. To assist in the development of this action plan national governments were required to complete a renewable energy template. This template identifies the various renewable energy resources and analyses the energy use for electricity, heat and transport.

3.4 Regional Policy Context

County Clare is part of the Mid West Region of Ireland. The Clare and Limerick Climate Change Strategies were used as the template for the expanded Mid West Regional Climate Change Strategy, 2008. The development of renewable energy projects in the Mid West Region will also comply with the Mid West Area Spatial Plan, and the Regional Planning Guidelines.

3.5 Local Policy Context

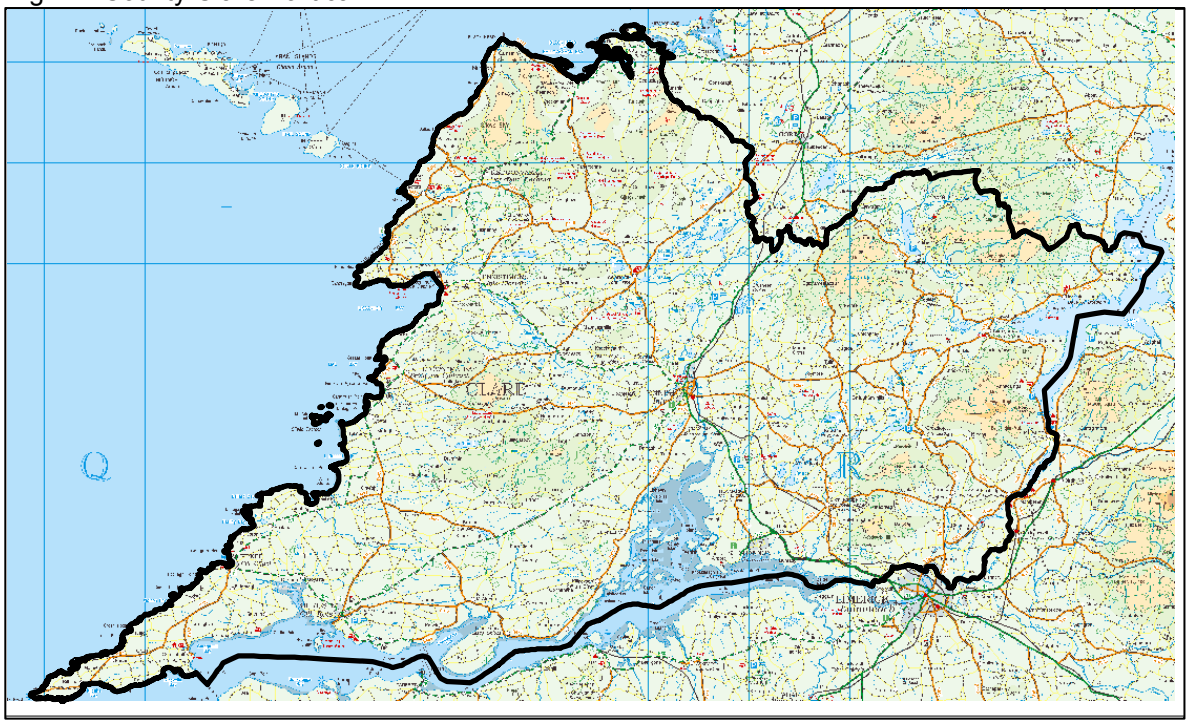
Local Policy on energy and climate change is determined in the first instance by Clare County Council in the County Development Plan, as outlined in Section 2.1 above. However the counties energy consumption and its associated climate change implications will be significantly dependant upon the actions of very large energy users such as Money point power generation station, and Shannon Airport as well as the accumulated effects of the industrial, commercial, agricultural, residential and transport energy consumers.

Profile of County Clare Energy & Climate Change

4. Profile of County Clare

Clare is situated on the west coast of Ireland in the province of Munster, covering an area of some 318,784 hectares (787,715 acres. The County's coastline is 360km in length and it has world class natural energy resources of wind, wave and tidal.

Fig. 4.1 County Clare Political



The counties population has been relatively consistent in relation to the national at 2.5%, and is presently approximately 105,500 people. The county capital is Ennis, located in the centre of the county with a population of approximately 20,100.

Table 4.1 County Clare Population.

Population	**CSO Census 1971**	**CSO Census 1981**	**CSO Census 1991**	**CSO Census 2002**	**CSO Census 2006**
Clare	75,008	87,567	90,918	103,277	105,571
% of National	*2.52%*	*2.54%*	*2.58%*	*2.64%*	*2.49%*
National	2,978,248	3,443,405	3,525,719	3,917,203	4,239,848

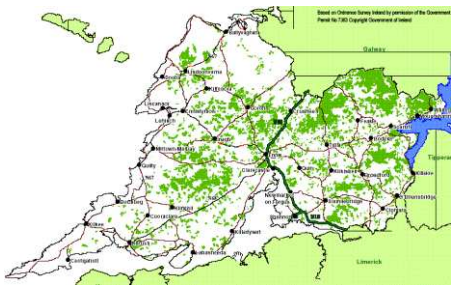
Source: Central Statistics Office, Census

4.1 County Clare Energy Production

County Clare's heritage of electricity generation, storage and distribution has been the corner stone of revolutionary change in Ireland since the construction of Ardnacrusha power station (once the largest civil engineering project in Europe) which moved Ireland from a low value agrarian society to the economy of the 20th Century. Today that heritage has the potential to move Ireland again into the 21st Century Low Carbon Economy, underpinning Ireland's fragile energy security and establishing low carbon wealth creation. The county has renewable energy resources from:-

- Biomass (wood and short rotation coppice crops)
- Wind, with world class wind energy resources
- Wave & Tidal resources are also world class
- Hydro from rivers and also possible pumped hydro storage

4.1.1 Biomass Energy Production



Clare has total area of 43,694 Ha under forestry in 2000 (Dept of Agriculture 2001) This equates to approximately 14% of the land area which is above the national average of 9.9% (Clare CDB 2001) 47% of this forestry is privately owned with the balance 53% in public ownership. Broadleaf trees make up 15% of the total area (Dept. of Agriculture 2001)

County Clare also has suitable land for the production of energy crops such as:-

Short Rotation Coppice – Willow

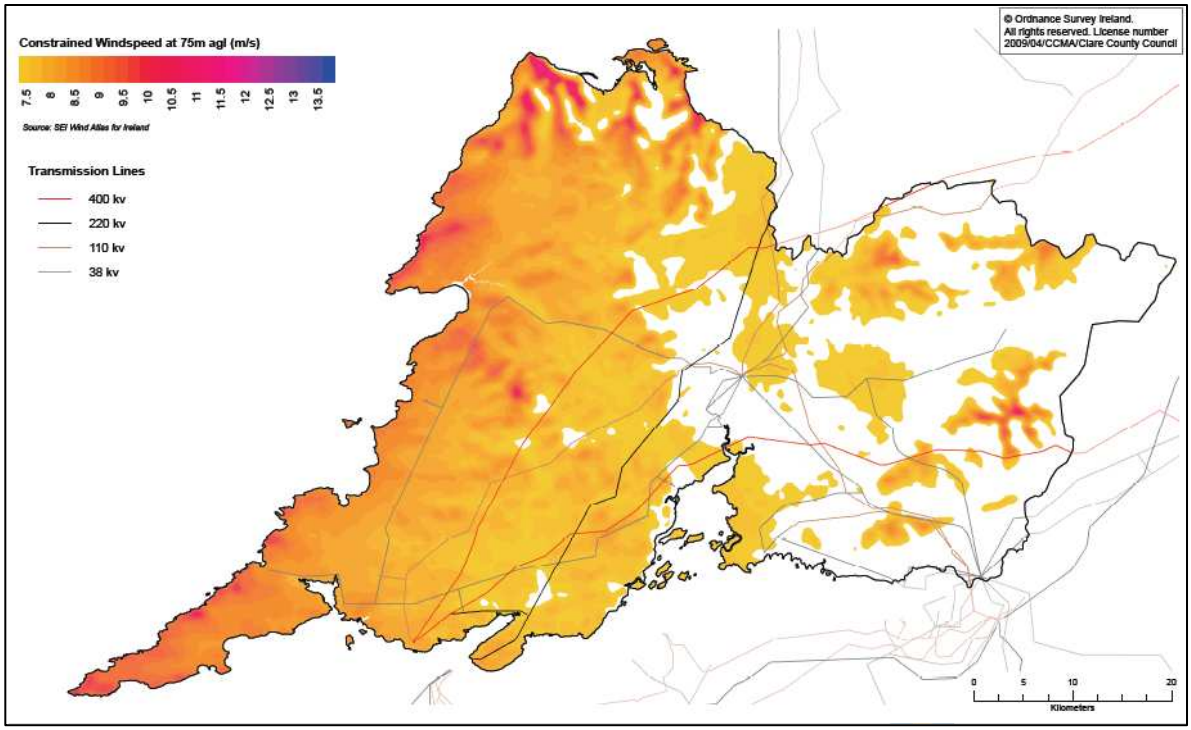
Miscanthus (elephant grass)

Grass (for the production of bio – gas)

4.1.2 Wind Energy Production

The county has world class wind energy resources. Clare county Council has recognized this by developing a Clare Wind Energy Strategy with a minimum target of 550 MW to be connected by 2017. The map below shows the wind power potential in relation to the electricity grid network.

Fig. 4.1 County Clare Wind Energy Potential and Electricity Grid.



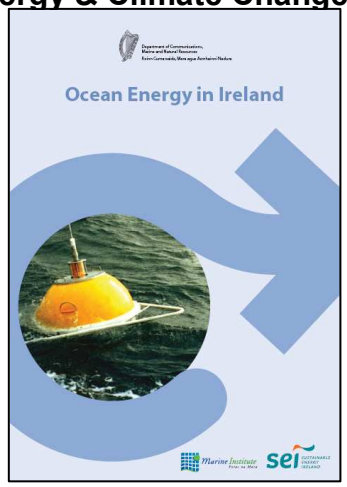
Thought the county has the best grid infrastructure in Ireland, access to the grid has been identified as a considerable barrier to the timely delivery of the Clare Wind Energy Strategy. Access to the grid has been based on a system of collective development known as “gating”. Presently the Ireland is in the process of working through “gate 3”. The table below shows the present status of wind energy projects in the county.

Category	Operational	Planning Approved	Gated*	Min Target
	MW	MW	MW	MW
Wind-Comm	32.10	268.919	127.419	550
Wind Micro gen	1.00			
Totals	***33.10***	***268.92***	***127.42***	***550.00***

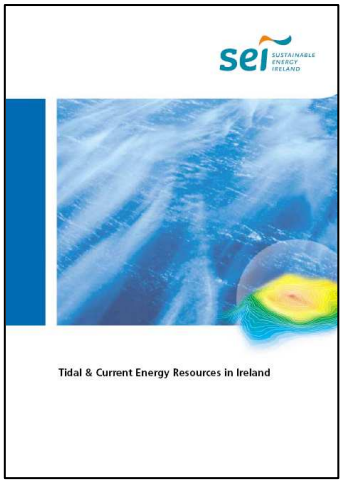
It will be a priority of the steering committee to assist these projects to acquire connections and also to identify the potential for manufacturing and service jobs associated with the turbines and towers.

4.1.3 Wave & Tidal Resources

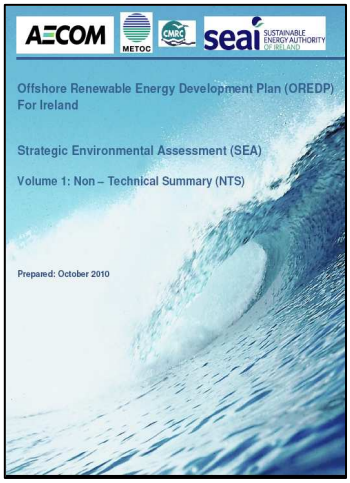
Ireland has a national target of 500 MW of ocean energy by 2020. Several studies have been conducted since 2005 into the potential for ocean energy and every one has identified the resources of wave and tidal energy in County Clare.



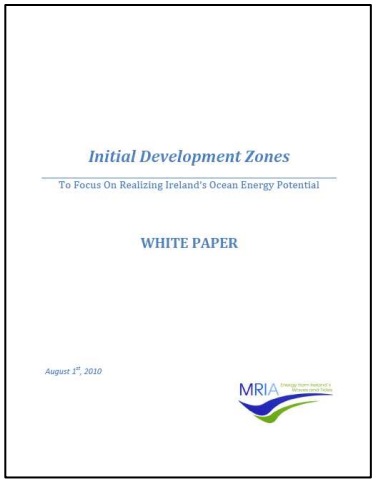
Several engineering and energy utility companies have conducted their own studies in County Clare, and one industry group called the Marine Renewables Industry Network has identified the county as one of 4 development areas for immediate attention.

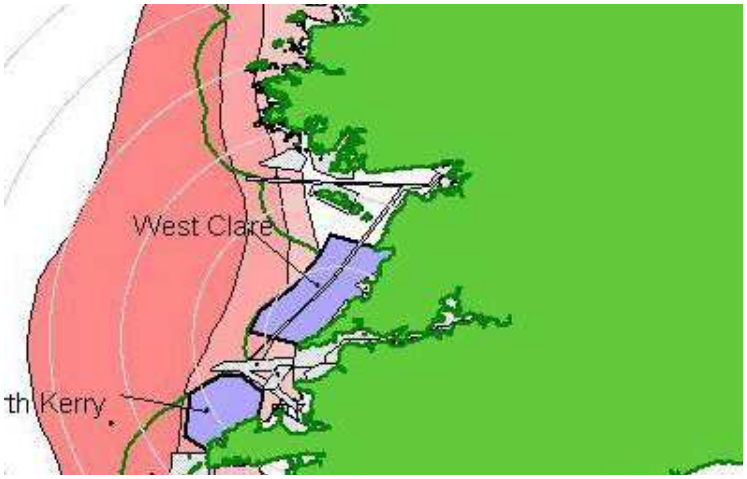


The Department of Communications, Energy & Natural Resources has opened a public consultation period until January 18th 2011, seeking to establish a national ocean energy strategy. It is anticipate that the national strategy will be formalised by the end of March 2011.



County Clare will endeavour to ensure that the economic and social added value of this new energy resource is established locally with the associated manufacturing and service industries.

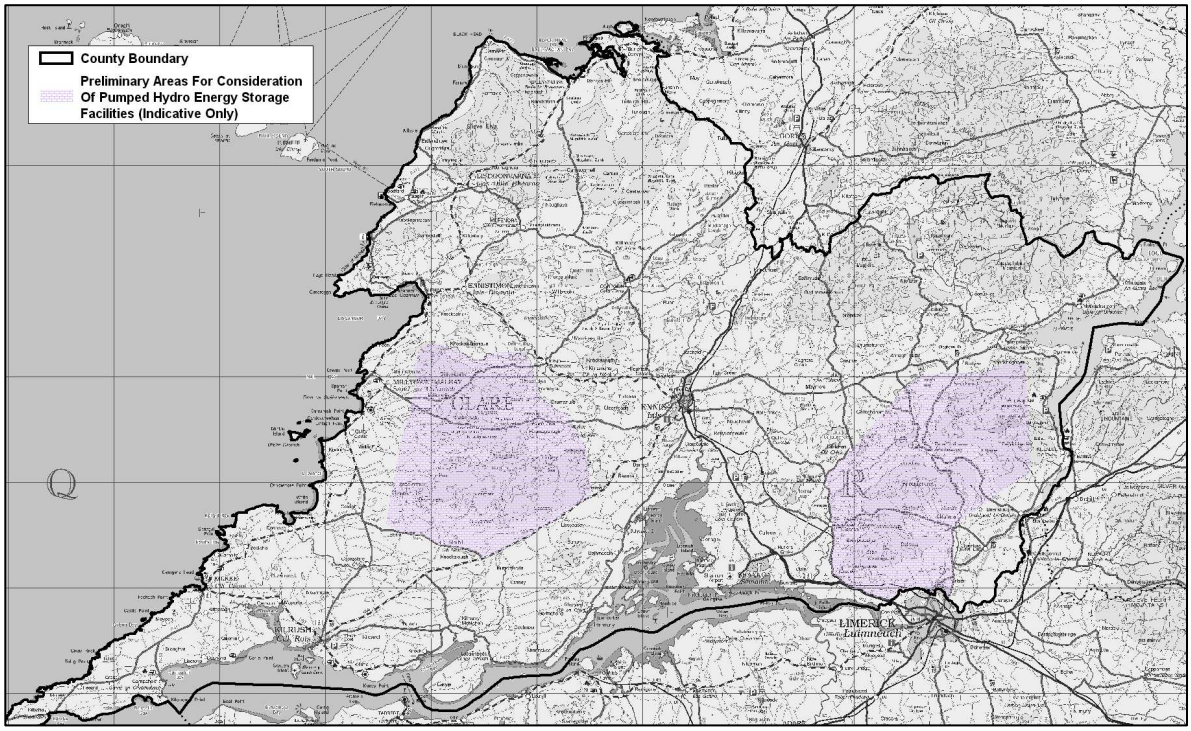




4.1.4 Hydro Electric Potential

Hydro electric power is not new to County Clare, as it was at Ardnacrusha that Ireland established the basis of the Rural Electricification scheme that was responsible for moving Ireland from a low value agrarian society in the 1930's to the high value economy of the 2,000's. Ardnacrusha was at the time the largest civil engineering project in Europe, producing 89 MW of electricity from clean low carbon resources. Today Ardnacrusha can only meet less than 2% of Ireland energy needs.

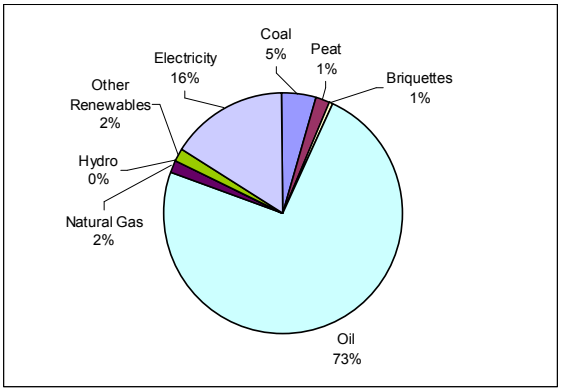
Another Hydro electric technology is Pumped Hydroelectric Energy Storage (PHES). PHES is the largest and most mature form of energy storage available in the world, with over 90 GW installed in approximately 240 facilities. Clare County Council has identified two main areas within the county (shown below as shaded) that may be suitable for such technology.

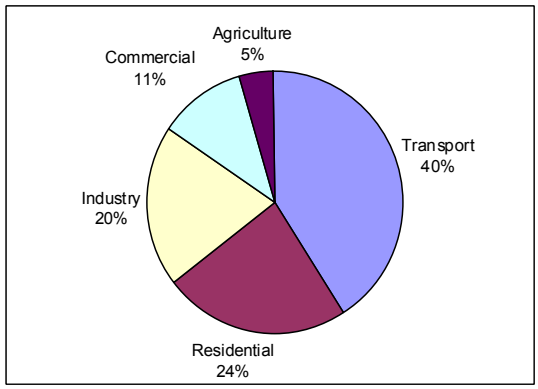


Source: Draft County Development Plan, 2001 – 2017, Volume 1.

4.2 County Clare Energy Analysis by Fuel Consumed

Fuel - GWh	1990	2000	2004	2005Est	BAU 2010
Coal	258.5	170.6	183.0	165.8	101.2
Peat	172.6	55.0	55.1	50.5	32.7
Briquettes	50.0	37.8	27.9	25.6	16.6
Oil	1,420.4	2,544.8	2,800.7	2,883.0	3,422.6
N.atural Gas	-	3.5	65.0	83.9	109.7
Hydro					
Other RES	34.0	45.9	65.8	65.6	64.6
Electricity	320.7	549.2	608.9	631.4	757.2
TFC	**2,256.2**	**3,406.8**	**3,806.3**	**3,905.7**	**4,504.6**





Clare Energy Mix by Fuel

Electricity

	Installed	Installed	Planned &	Generation
Coal /oil	915			
Hydro-river		89	0	100 MW
Hydro -				250 MW
Wind		32	182	550 MW+
Wave				100 MW +
Tidal				50 MW+
Totals	**915**			**1,050**

Thermal

12% thermal energy target is equivalent to 86,000 tonnes of wood chip at 35% MC Without market stimulus Clare will be 20,000 tonnes short. With market stimulus Clare can meet a 12% target but needs to install 95 MW of biomass boilers (presently have 1.5 MW). District heating and Combined Heat & Power (CHP) potential also exists.

4.3 County Clare Energy Analysis by Sector

Table 10.4: Total Final Consumption by Sector, Clare County, (1990 – 2015)

GWh	1990	2000	2002	2005	BAU 2010	BAU 2015
Transport	634.2	1,255.2	1,464	1,578.1	2,007.4	2,181.2
Residential	646.9	789.2	818.9	902.3	997.7	1,075.1
Industry	567	788.5	778.9	823.5	803.3	894.3
Commercial	265.8	392.2	397.7	432.9	527.7	574.1
Agriculture	142.3	184	181.1	168.8	168.5	161.4
Total	2,256.2	3,409.1	3,640.6	3,905.7	4,504.6	4,886.1

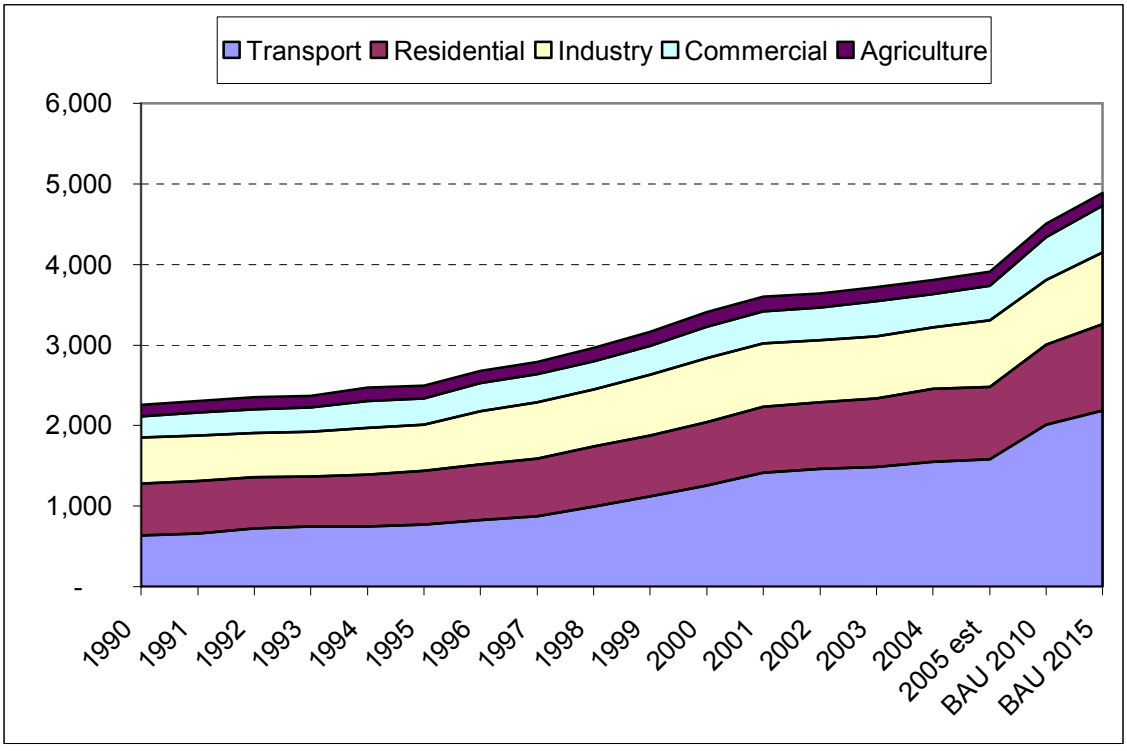


Chart 10.7: Total Final Consumption by Sector, Clare County, (1990 – 2015)

The analysis of consumption by Sector indicates the following key issues:

- The TFC for the county grew by 73% since 1990 and the business as usual forecast indicates the TFC will double from 2256 GWH to 4504 GWh in 2010.

- Transport will account for the greatest growth in consumption by 2015, with a predicted increase of over 240% above 1990 levels.

- The increased level of housing is reflected in the fact that the residential sectors share of TFC has grown by 40% since 1990 and is predicted to increase by another 26% by 2015.

- The commercial sector has shown a higher increase in consumption when compared to the Industrial sector since 1990 (63% for commercial compared to 45% for industry) which would mirror the National trend of a move to more service based employment.

- County Clare's energy intensity is 1,351 kWh / €,000 (Gross Value Added). This is well above the national average of 1,032 kWh / €,000. This indicator must be improved.

Consultation Process & Steering Committee

5. Consultation Process

For the purpose of expediency the consultation process for the identification of Objectives and Action Plan was limited to the members of the Steering Committee members and invited stakeholders.

5.1 Steering Committee

The steering committee members are:-

Clare Accessible Transport

- Clare Chambers of Commerce
- Clare County Council
- Clare Community Forum
- Clare Local Development Company
- Electricity Supply Board
- Irish Farmers Association
- Limerick Clare Energy Agency
- Shannon Development
- Teagasc

5.2 Terms of Reference

5.2.1 Terms of reference for the agency-based Steering Committee

A steering committee will be established that will serve as the driving force behind the development of the strategy.

It is proposed that the Steering Committee will include agencies currently delivering key / core services on a countywide basis with an energy, development and environment remit.

The representatives on the Steering Committee from each agency will provide key linkages with those delivering the services to the various target groups. This agency-based approach will also ensure “buy in” to both the strategy and the actions developed under the strategy

5.2.2 Purpose of the Steering Committee

- Identify key issues/ areas to be included in and addressed within the Strategy.
- Act as a key link with others in their parent agency and the Steering Committee.
- Agree both the consultation process itself and the extent of the process with wider community in Co. Clare.
- Agree timeframe for the completion and launch of the Strategy.
- Provide a forum for review and monitor of progress of the actions within the strategy going forward

Each member of the Steering Committee:

- Will be the link between the Steering Committee and the area that they represent.

- Will be responsible for identifying key issues from their representative group / agency.
- Will be responsible for forwarding recommendations to the Steering Committee from their relevant agency and representative cohort group.
- Ensure buy-in by parent agency in relation to actions agreed under the operation plans developed under the strategy

5.2.3 Operational details

- Chair – Limerick Clare Energy Agency
- Meetings shall be held monthly from December 2009 through to April 2010.
- Venue – Clare County Council offices
- Quarterly meetings for monitoring and review of progress will be held for the period of 2010 – 2012.

5.2.4 Reporting structure:

An update on progress will be provided at all CDB meetings scheduled in 2010 by the Chair of the Steering Group.

Clare County Council Community & Enterprise will assist the Steering Group in developing the strategy by attending meetings, providing research assistance where available and appropriate and liaising on the development and implementation of the strategy with the Director of Community and Enterprise and Clare County Council.

Themes & Objectives

The objectives of the strategy are in 5 – main themes, the number of related actions is shown in brackets.

- **F.** Energy Security, Conservation & Efficiency (1,2)
- **G.** Renewable & indigenous energy (3,4,5)
- **H.** Low Carbon Economy – Reduce CO2 Emissions (6,7,8)
- **I.** Research & Development capacity in Alternative Energy (9)
- **J.** Transport energy efficiency, conservation & renewable energy (10)

5.2.1 Objectives of the Strategy

A. Energy Security, Conservation & Efficiency

Objective 1. Reduce the economic and social dependence on imported fossil fuels, by meeting various national policies

Objective 2. Increase energy conservation & efficiency practices in all sectors of the economy through the promotion of energy benchmarking and energy efficiency technologies. Promote & develop the skills of individuals and organisations required to achieve this objective.

B. Renewable & Indigenous Energy

Objective 3. Promote & develop the use and integration of renewable energy technologies in all sectors of the economy. Promote & develop the skills of individuals and organisations required to achieve this objective.

Objective 4. Promote & develop an indigenous heat energy market that will enable the county to provide at least 12% of the counties space heating demand from indigenous renewable resources, by 2020. Promote & develop the skills of individuals and organisations required to achieve this objective.

Objective 5. Develop an indigenous electric energy market that will enable the county to provide at least 40% of the counties electricity demand from indigenous renewable resources, with an initial target of 550 MW from wind resources, by 2020. Promote & develop the skills of individuals and organisations required to achieve this objective.

C. Low Carbon Economy – Reduce CO_2 Emissions

Objective 6. Establish & promote County Clare as a county that has a strong and secure energy infrastructure, capable of providing low / zero carbon energy to existing commercial & industrial sectors, and those wishing to locate in the county. The development of carbon reduction, capture, storage and carbon trading would is encouraged to support his objective.

Objective 7 Establish a Low Carbon Commerce Centre(s) within the County and to identify potential possible areas for such development.

Objective 8 Reduce the energy & CO2 emissions associated with economic and social activity, below the national average.

D. Research & Development Capacity in Alternative Energy

Objective 9 Establish capacity for Research & Development in Alternative Energy Technologies within the county. Promote & develop the skills of individuals and organisations required to achieve this objective.

E Transport Energy Efficiency, Conservation & Renewable Energy

Objective 10 Promote & develop the use of alternative energy fuels and technologies in the provision of transport services.

Details of the Objectives and actions can be seen in Section 6 below.

Action Plan

6. The Action Plan is divided into the themes and objectives of the Integrated Strategy

THEME 1. Energy Security, Conservation & Efficiency

Objective 1. Reduce the economic and social dependence on imported fossil fuels, by meeting various national policies

ACTIONS:

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Qtr	Year	Qtr	Year	
1	Identify Large Energy Users / Audit of existing fuel needs	**LCEA**; .CLDC, Shannon Dev.	MWRA, Atlantic way, SEAI	3	10	4	10	Data base of large energy users and their energy needs
2	Energy Audits for SME's	**LCEA; .**CLDC, Shannon Dev.	Enterprise Ireland. NSAI, SEAI	1	11	4	12+	On going provision of audits to SME's with assistance from a variety of bodies.
3	Energy efficiency training for employees	**Chambers,** Shannon Development, Community, CAT, LCEA	Enterprise Ireland. NSAI, SEAI	1	11	4	12+	Seminar / workshops on energy efficiency training. Templates / software to enable companies to prepare plans.
4	Energy Balance 2010 for Clare, including Renewable Energy Strategy	**LCEA**, CLDC	Atlantic Way, UL - NUIG - LIT - GMIT	4	10	3	11	A revised Energy & Emissions Balance, with forecast to 2020 incorporating an action plan for increased use of renewables
5	Climate Change Strategy 2010 for Clare	**LCEA,** CLDC	Atlantic Way, UL - NUIG - LIT - GMIT	4	10	3	11	A revised Climate Change Strategy, with forecast to 2020 incorporating an action plan

6	Low carbon efficient electricity generation at money point by 2012	**ESB.**	Clare County Council – IFA - Teagasc	4	12	?	?	Feasibility study of Biomass co-firing at Money Point. Possible use of local biomass as part of supply. Local supply to be quantified.

THEME 1. Energy Security, Conservation & Efficiency

Objective 2. Increase energy conservation & efficiency practices in all sectors of the economy through the promotion of energy benchmarking and energy efficiency technologies. Promote & develop the skills of individuals and organisations required to achieve this objective.

ACTIONS:

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Energy Mgt. Certification of SME's	**LCEA** Shannon Dev Community group CLDC	NSAI EI SEAI	2	10	4	12+	Energy Management Certificate Programme Introduce ISO 16000 to SME's Manual on Energy Mgt.
2	"Green" Ennis & its businesses 1. E Mgt. Certificates 2. Green Business 3. Demonstration retail – Energy Efficiency 4. Green Print	**Chambers** Clare Accessible Transport LCEA	EI BRE – Ireland Ennis Town Council Tidy Towns Committee Renewable Energy Skills	2	11	4	12+	Green Business Certificate Programme Green Hospitality Programme Marketing programme Pilot on a street / shopping centre

THEME 2. Renewable & Indigenous Energy

Objective 3. Promote & develop the use and integration of renewable energy technologies in all sectors of the economy. Promote & develop the skills of individuals and organisations required to achieve this objective

ACTIONS:

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Establish a wave & tidal energy sites (test / production)	**LCEA** ESB Shannon Dev Clare Co Co	Marine Institute UL - NUIG - LIT - GMIT SEAI Shannon Energy Valley Spirit of Ireland	1	11	4	12+	Identify suitable sites with community input / benefit Identify appropriate foreshore - landfall Coordinate with Eirgrid Encourage marine energy industry submissions Identify service centre for marine energy
2	Promote Off shore wind energy test sites / production	**LCEA;** Clare Co Co, Chambers,	Shannon Foynes Port Authority	4	10	4	12+	Marine Energy Potential Study Marine Energy Convention in Clare Clare Co Co planning strategy
3a	Promote / develop Renewable Energy Skills Training	**RE Skillsnet;** Chambers Community group LCEA	Teagasc, Shannon Development LIT – UL – NUIG - GMIT FAS	2	10	4	12+	Establish training courses in renewable energy Establish FETAC courses on renewables Establish business training modules on renewables

THEME 2. Renewable & Indigenous Energy

Objective 3. Promote & develop the use and integration of renewable energy technologies in all sectors of the economy. Promote & develop the skills of individuals and organisations required to achieve this objective

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Qtr	Year	Qtr	Year	
ACTIONS (continued):								
3b	Establish the feasibility of a regional renewable energy advice office / showroom. Equipment & controls would be on view.	**LCEA;** Chambers CLDC	IMECO	4	11	4	12	A independent advice office for consumers Feasibility study on RE advice centre
4	Integrate Renewable Technologies & energy into public buildings – (minimum targets?)	**LCEA;** Clare Co Co Community group Shannon Dev	DoEH&LG DEC&NR SEAI - OPW ESCO	4	10	4	12+	Database of large public buildings Promotion of RE technologies to public buildings Increase in use of RE technologies in Public build
5	Integrate renewables into SME's & large energy users	**LCEA;** Chambers CCWEP Shannon Dev	DoEH&LG DEC&NR SEAI - OPW	4	10	4	12+	Database of SME's Promotion of RE technologies to SME's Increase in use of RE technologies in SME's

THEME 2. Renewable & Indigenous Energy

Objective 4. Promote & **develop an indigenous heat energy market** that will enable the county to provide at **least 12% of the counties space heating demand from indigenous renewable** resources, by 2020. Promote & develop the skills of individuals and organisations required to achieve this objective

ACTIONS:

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Qtr	Year	Qtr	Year	
1	Increase public awareness of renewable heat	**LCEA** CCWEP - CLDC, Shannon Dev Community group Teagasc	Heat entrepreneurs RE Skillsnet, Suppliers, IFA	4 4 4	10 10 10	4 4 4	12+ 12+ 12+	Marketing campaign for renewable heat Know the grower scheme (similar to food) Schools etc invited to see RE heat projects
2	Establish Renewable Heat Energy Quality Supply Chain, Production, Delivery, Testing, Harvesting, ESCO, etc.	**CCWEP;** Chambers Community group LCEA – IFA - Teagasc CLDC, Teagasc	Heat entrepreneurs RE Skillsnet; SEAI NSAI; Biomass Suppliers UL - NUIG - LIT - GMIT	2 2	10 10	4 4	12+ 12+	Financial Appraisal / Booklet for heat buyers Pilot - Fuel quality test / certification
3	Establish training / Mentoring for renewable heat entrepreneurs	**RE Skillsnet,** LCEA; CLDC IFA; Teagasc, CCWEP - CLDC,	UL - NUIG - LIT - GMIT FAS	4 4	10 10	4 4	12+ 12+	Training modules in Renewable Energy Mentoring network for ESCo's
4	Establish a Renewable Thermal Energy Strategy for County Clare, building on the existing Clare Wind Energy Strategy	**LCEA**; CLDC, Clare County Council IFA - TEAGASC	Chambers CCWEP	4	10	4	11	A County Council Strategy on Renewable Energy Part of the County Development plan

THEME 2. Renewable & Indigenous Energy

Objective 5. Develop an indigenous electric energy market that will enable the county to provide **at least 40% of the counties electricity demand from indigenous renewable** resources, with an initial **target of 550 MW** from wind resources, by 2020. Promote & develop the **skills** of individuals and organisations required to achieve this objective.

Actions

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Qtr	Yr	Qtr	Yr	
1	Increase public awareness of renewable electricity & positive effect on climate change	**LCEA** Shannon Dev Community group CLDC, Teagasc, IFA	IWEA , Chambers NPWS, ISSA An Taisce; Suppliers	4	10	4	12+	Series of seminars / conference Schools etc invited to see RE electric projects Market local RE education / training providers Collection & Circulation of related information to policy & decision makers
2	Planning for renewable electricity – Stakeholder workshops.	**LCEA;** Clare County Council, Chambers Community Group CLDC; IFA Teagasc Chambers	ESB Coops, Fisheries, NPWS, An Taisce Eirgrid, ESB networks	3	10	4	12+	Series of seminars Improved working relationships

THEME 2. Renewable & Indigenous Energy

Objective 5. Develop an indigenous electric energy market that will enable the county to provide **at least 40% of the counties electricity demand from indigenous renewable** resources, with an initial **target of 550 MW** from wind resources, by 2020. Promote & develop the **skills** of individuals and organisations required to achieve this objective.

Actions (continued)

No	ACTION	LEAD & Partners	Other Supporters	Start Time Q.	Start Time Yr	End Time Q.	End Time Yr	Outcome's)
3	Integrate Renewable Electricity / CHP into public buildings – (minimum targets?)	**LCEA** Clare County Council Shannon Dev	SEAI DoEH&LG, Community group	2	11	4	12+	Database of large public buildings Promotion of RE technologies to public buildings Increase in use of RE technologies in Public build
4	Promote the Integration renewables electricity into SME's & large energy users	**LCEA;** Chambers, Shannon Development	SEAI Spirit of Ireland Shannon E Valley Atlantic Way	1	11	4	12+	Workshops, Marketing, awards scheme
5	Establish training for renewable Electric entrepreneurs	**RE Skillsnet;** LCEA CLDC	Shannon Development UL - NUIG - LIT - GMIT FAS	2	11	4	12+	Establish training courses in renewable electricity Establish FETAC courses on renewable electricity Promote training modules on renewable electricity
6	Establish a Renewable Electric Energy Strategy for County Clare, building on the existing Clare Wind Energy Strategy	**LCEA**; Clare County Council CLDC	Teagasc, IFA, Community Groups,	4	10	4	11	A County Council Strategy on Renewable Energy Part of the County Development plan

THEME 3. Low Carbon Economy

Objective 6. Establish & promote County Clare as a county that has a **strong and secure energy infrastructure, capable of providing low / zero carbon energy** to existing commercial & industrial sectors, and those wishing to locate in the county. The development of carbon reduction, capture, storage and carbon trading would is encouraged to support his objective

Actions

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Ensure the electricity transmission & distribution infrastructure is capable of supporting the counties RE targets	**Clare County Council** Chambers; Community group LCEA	ESB Eirgrid ESB networks	4	10	4	12+	Review of the county infrastructure Community support or otherwise on a case by case basis Discussions with Networks and Eirgrid.
2	Promote - Establish renewable electric generation & storage capacity to meet the counties RE targets	**LCEA** - CLDC Clare County Council Shannon Dev Community group; ESB - IFA	Atlantic Way Spirit of Ireland Shannon Energy Valley	3	10	1	11	Pumped Hydro Electric Potential Study Strategic Environmental Assessment of suitable sites Strategy on PHES / Storage in County Development Plan Community support or otherwise on a case by case basis
3	Promote / Establish District Heating. / CHP	**LCEA** Clare County Council Shannon Development Community group	Atlantic Way Shannon Energy Valley	1 4	11 11	3 4	12+ 12+	Feasibility study of 2-3 key areas District heating / CHP installation Community support or otherwise on a case by case basis

THEME 3. Low Carbon Economy

Objective 6. Establish & promote County Clare as a county that has a **strong and secure energy infrastructure, capable of providing low / zero carbon energy** to existing commercial & industrial sectors, and those wishing to locate in the county. The development of carbon reduction, capture, storage and carbon trading would is encouraged to support his objective

Actions (continued..)

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
4	Promote / Establish carbon capture, storage & trading	**ESB** Shannon Dev	UL - NUIG - LIT - GMIT SEAI ESB	2	11	4	12+	Feasibility study of carbon capture, storage Technology / capacity in Co. Clare Community support or otherwise on a case by case basis
5	Establish the information technology infrastructure to support Smart Grid and the use of renewable technologies	**ESB** Shannon Dev Clare County Council	UL - NUIG - LIT - GMIT SEAI ESB	4	10	4	12+	Feasibility study Pilot project's) Community support or otherwise on a case by case basis

THEME 3. Low Carbon Economy

Objective 7: Establish a **Low Carbon Commerce Centre's)** within the County and to identify potential possible areas for such development.

Actions

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Establish a business incubator / cluster of energy commerce / sustainability	**Clare County Council** LCEA Chambers Community group Shannon Development	UL - NUIG - LIT - GMIT BRE-Ireland	2	11	4	12+	Cluster of energy related businesses
2	Establish a sustainability centre / business zone– with its energy requirements met from renewable energy & low carbon	**Clare County Council;** LCEA Chambers; Shannon Development CLDC	Atlantic Way; BRE-Ireland	1	11	4	12+	Identify 2/3 suitable sites Feasibility study of site / zone Commercial / industrial cluster served by low carbon indigenous energy

THEME 3. Low Carbon Economy

Objective 8. Reduce the **energy & CO2 emissions** associated with economic and social activity, below the national average.

Actions

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Public Sector CO_2 benchmarking	**LCEA** Clare County Council Community group	NSAI RWMO CCMA Atlantic Way	1	11	4	12+	Buildings DEC of public buildings Water services benchmarking L.A. Energy & CO2 reporting
2	SME CO_2 benchmarking utilising existing systems (Energy Management Certificates; Green Hospitality etc.)	**LCEA** Clare County Council Chambers Shannon Dev	EI; Burren Connect NSAI ; CLDC RWMO ISME – SFA Atlantic Way	1	10	4	12+	Energy & CO_2 Benchmarking system Workshops on energy & CO_2 savings for SME Peer mentoring programme Intern programme for energy surveys

THEME 4. Research & Development Potential

Objective 9. Establish **capacity for Research & Development** in Alternative Energy / sustainability Technologies within the county. Promote & develop the skills of individuals and organisations required to achieve this objective.

Actions

No.	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Promote innovation, research & development through funding of alternative energy projects	**LCEA** Shannon Dev CLDC	Enterprise Ireland VEC UL - NUIG - LIT - GMIT Atlantic Way	2	10	4	12+	Promotion & market RE - RD&D programme Number of small Energy related RD&D projects
2	Establish third level & Industry Expertise R&D presence, focusing on sustainability issues ***(linked to enterprise strategy)***	**Clare County Council** Shannon Dev LCEA Community group	UL - NUIG - LIT - GMIT	2	11	4	12+	Identify research sites & subjects in County Clare Identify researchers based / working in Clare Establish research links to 3rd level universities Establish research centre

THEME 5. Transport Energy Efficiency, Conservation & Renewables

Objective 10. Promote & develop the use of **alternative energy fuels** and technologies in the provision of **transport services**.

Actions

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
1	Attract car drivers towards more energy efficient transport, reducing single person journeys.	**Clare Accessible Transport** LCEA; Shannon Development; CLDC Clare County Council	Bus Éireann, Iarnród Éireann, Taxi, Independent Bus companies, DoT	4	10	4	12 +	Promotion of car pooling Promotion - Establish eco driving scheme Feasibility study
2	Review the Promotion of a Pilot Electric Vehicle bus (public transport)	**Clare Accessible Transport** ESB; LCEA	EU - DoT; SEAI; Ennis Town Council;	1	12	4	12 +	Identification of suitable route for electric bus Feasibility study of route's): Feasibility of Ennis Town Service Pilot project
3	Promote & develop the use of Electric vehicles – private transport	**ESB** Clare County Council; LCEA Clare Accessible Transport	UL - NUIG - LIT - GMIT	4	10	4	12 +	Identify suitable charging points Promotion of electric vehicles
4	Promote & develop the use of Alternative fuel (Hydrogen – bio fuel) vehicles – private transport	**LCEA;** Clare County Council; CLDC Clare Accessible Transport	UL - NUIG - LIT - GMIT	4	11	4	12 +	Identify suitable infrastructure Promotion of Alternative Energy vehicles

THEME 5. Transport Energy Efficiency, Conservation & Renewables

Objective 10. Promote & develop the use of **alternative energy fuels** and technologies in the provision of **transport services**.

Actions (continued..)

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
5	Audit of existing transport systems & commuter patterns	**Clare Accessible Transport** Clare County Council; LCEA CLDC Shannon Development	Atlantic Way; Central Statistics Office	4	10	4	11	Review research for County Development Plan Review CSO data on travel & transport Discussions with service providers
6	Promote Park & Ride facilities Feasibility study	**Clare Accessible Transport** Chambers, Shannon Development Clare County Council; Ennis Town Council	Bus Éireann, Iarnród Éireann, Taxi, Ennis Town Council; Community group	2	11	4	12 +	Identification of suitable sites Feasibility study of site's) Pilot project
7	Promote & Develop Car Pooling & Car Sharing Coordination centre	**Clare Accessible Transport** Clare County Council; Chambers Community group LCEA; Shannon Development	SEAI; Atlantic Way	2	11	4	12 +	Promotion of car pooling Feasibility study of needs & resources Pilot project

THEME 5. Transport Energy Efficiency, Conservation & Renewables

Objective 10. Promote & develop the use of **alternative energy fuels** and technologies in the provision of **transport services**.

Actions (continued..)

No	ACTION	LEAD & Partners	Other Supporters	Start Time		End Time		Outcome's)
				Q.	Yr.	Q.	Yr.	
8	Promote Public Transport Public Awareness	**LCEA;** Chambers Clare Accessible Transport Clare County Council Community group	Bus Éireann, Iarnród Éireann, Taxi, SEAI	4	10	4	12 +	Coordination with various service providers Marketing campaign targeted at various sectors
9	Energy Efficiency Travel training for employees	**LCEA;** Chambers, Clare Accessible Transport; Community group; Shannon Development Shannon Development	Bus Éireann,, Insurance Companies. Road Safety Authority Training providers.	4	10	4	12 +	Seminar / workshops on travel training. Templates / software to enable companies to prepare plans. Smarter travel scheme's; Incentive Schemes
10	Co-ordination of existing transport resources through 'one stop shop' call centre. IT resources needed	**Clare Accessible Transport** Community group	Bus Éireann, Iarnród Éireann, Taxi, Independent Bus companies, DoT	4	10	4	12 +	Feasibility study IT resources (hardware - software) Marketing campaign

Implementation, Monitoring & Evaluation

7. Implementation, Monitoring & Evaluation

7.1 National & Local Obligations

7.2 Management of Implementation, Monitoring & Evaluation

7.2.1 The Steering Committee

The Integrated Strategy on Energy & Climate Change will be overseen by the Steering Committee. The Limerick Clare Energy Agency will chair these meetings and also will lead on some actions.

The Steering Committee will work with all interested organisations in the county to deliver on the Objectives and Action Plan. Progress on the delivery of the strategy will be managed by:-

- Quarterly meetings of the Steering Committee members
- Establishment of priority sub committees as the need arises
- An electronic Tracking System will be put in place that will be available to all committee members to review and contribute to.
- Community meetings will be held to ensure the needs of locals are met, especially in any strategic areas for renewable energy projects.
- The strategy will be fully reviewed by June / September 2011

The Purpose of the Steering Committee is to:-

- Identify key issues/ areas to be included in and addressed within the Strategy.
- Act as a key link with others in their parent agency and the Steering Committee.
- Agree both the consultation process itself and the extent of the process with wider community in Co. Clare.
- Agree timeframe for the completion and launch of the Strategy.
- Provide a forum for review and monitor of progress of the actions within the strategy going forward

Each member of the Steering Committee:

- Will be the link between the Steering Committee and the area that they represent.
- Will be responsible for identifying key issues from their representative group / agency.
- Will be responsible for forwarding recommendations to the Steering Committee from their relevant agency and representative cohort group.
- Ensure buy-in by parent agency in relation to actions agreed under the operation plans developed under the strategy

Glossary

Acronym	Full Title / Description
An Taisce	National Trust for Ireland
Atlantic Way	Business network based in Shannon
BRE - Ireland	Building Research Establishment - Ireland
Bus Éireann	National inter city bus company
CAT	Clare Accessible Transport
CCMA	City & County Managers Association
CCWEP	County Clare Wood Energy Project
CER	Commission for Energy Regulation
Chambers	Chambers of Commerce group in county Clare
Clare Co Co	Clare County Council
CLDC	Clare Local Development Company
CMP	Conference of Member Parties (to Kyoto Protocol)
CO_2	Chemical notation for Carbon Di-Oxide
Community	Community group in county Clare
COP	Conference Of Parties to the Climate Change Convention
DCENR	Department of Communications Energy & Natural Resources
DOEH&LG	Department of Environment Heritage & Local Government
DOT	Department of Transport
EI	Enterprise Ireland
Eirgrid	Eirgrid - National Electricity Grid Company
Ennis TC	Ennis Town Council
ESB	Electricity Supply Board
ESBN	Electricity Supply Board Networks, local grid connections
ESCO	Energy Services Company
EU	European Union
FÁS	National Training and Employment Authority
GMIT	Galway Mayo Institute of Technology
GWh	Giga Watt Hour, unit of energy equal to 1,000,000 kWh (units of electricity)

Glossary Continued:

Acronym	Full Title / Description
Iarnród Éireann	National Rail company
IFA	Irish Farmers Association
IPCC	Inter-governmental Panel on Climate Change
ISME	Irish Small & Medium Enterprises (trade body)
IWEA	Irish Wind Energy Association
kWh	Kilo Watt Hour; unit of energy = a unit of electricity
LCEA	Limerick Clare Energy Agency
LIT	Limerick Institute of Technology
MWRA	Mid West Regional Authority
NPWS	National Parks & Wildlife Service
NSAI	National Standards Authority of Ireland
NUIG	National University of Ireland Galway
OPW	Office of Public Works
RE Skillsnet	Renewable Energy Skill network for heating
RSA	Road Safety Authority
RWMO	Regional Waste Management Office (Limerick, Clare, Kerry)
SEAI	Sustainable Energy Authority of Ireland
SEI	Sustainable Energy Ireland - now known as SEAI
SFA	Small Firms Association (trade body)
SFPA	Shannon Foynes Port Authority
Shannon Dev.	Shannon Development
Shannon Energy	Promoters of Renewable Electricity Generation, Storage &
Spirit of Ireland	Promoters of Renewable Electricity Generation, Storage &
TFC	Total Final Consumption, term for final use of energy
Teagasc	Irish Agriculture & Food Development Authority
UL	University of Limerick
UNFCC	United Nations Framework Convention on Climate Change
VEC	Vocational Education Committee

APPENDIX A – ENERGY & EMISSIONS POLICY CONTEXT DATA

A.1 Global Policy Context

The following table summarises some of the most recent actions taken by the Inter-governmental Panel on Climate Change (IPCC) including the United Nations Framework on Climate Change (UNFCC) and the Conference Of Parties (parties to the Kyoto Protocol).

Table A1.1 Timetable of Global Action on Climate Change

Year	*Event*	*Protocol Milestone*
2010	COP 16; CMP 6. Cancun, Mexico	29th November to 10th December
2009	COP 15; CMP 5. Copenhagen	EU increases CO_2 reductions and takes a global lead in climate change.
2008	COP 14; Poznań	Adaptation measures for Kyoto protocol & Ministerial meetings on Climate Change
2007	IPC report on the scientific evidence of Climate Change	World scientists agree that human activity is responsible for the increased rate of global warming
2006	COP 12 and COP/MOP 2 (Nairobi,	Initiate discussions on post Kyoto Agreements
2005	November/December COP 11 and COP/MOP 1 (Montreal,	February, Entry into Force of
2004	December COP 10 (Buenos	
2002	October and November COP 8	
2001	United states of America (USA)	
2001	October and November COP 7	Marrakesh Accord
2000	November, COP 6 (The Hague,	Talks based on the Plan Break
1998	November COP 4 (Buenos Aires,	Buenos Aires Action Plan
1997	December, COP 3 (Kyoto,	Kyoto Protocol Adapted
1995	March and April, COP 1 (Berlin,	March and April, Berlin Accord
1994	March, Convention enters into	
1992	May, INC adopts UNFCCC text	June, Convention opened for
1991	First meeting of INC	
1990	IPCC and second WCC call for	
1988	IPCC Established	
1979	First World Climate Conference	

A.2 European Union Context

As members the European Union, Ireland is legally bound to implement Directives issued by the EU Commission and cooperate with any international agreements entered into by the EU on behalf of its constituent members. The European Union has been to the forefront of negotiations on Climate Change, Greenhouse Gas reductions and has agreed internationally binding reductions in Greenhouse gases, to be achieved by 2020.

In addition the EU has identified energy security as a key priority, and has established the 20% targets by 2020:-

- 20% reduction in energy consumption
- 20% reduction in CO_2 emissions
- 20% increase in renewable energy

3.2.1 Kyoto Protocol

The Kyoto Protocol came into legal force in February 2005. The Protocol set binding agreements for the parties involved in terms of Green House Gas Emission reductions. The Kyoto Protocol deals specifically with the following gases.

- Carbon dioxide (CO2) 50% of all emissions
- Methane (CH4) 18% of all emissions
- Nitrous oxide (N2O) 6% of all emissions
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF6)

The Protocol sets targets for 39 developed countries and the European Union (EU) as a whole. Under the Kyoto Protocol the European Union agreed to an 8% reduction in greenhouse gas emission, based on 1990 data, by 2012. Measurement of compliance with this commitment takes place in the “Kyoto Period” of 2008 – 2012,

Following the COP meeting in Copenhagen, 2009, The European Union revised its commitment to greenhouse as reduction by increasing the target reduction to 20% reduction on 1990 levels by 2020.

3.2.2 Energy Efficiency & Renewables Energy

The European union has been very proactive internationally on the issues of energy security, renewable energy and climate change. Some of the key Directives and Polices related to energy and climate change taken since 2005 are:

- EU Directive 2009-28-EC promotion of renewable energy &Mandatory Targets
- EU Directive 2009-30-EC specification on transport fuels, lower ghg
- EU Directive 2009-72-EC rules on internal electricity market
- EU Decision 2009-548-ECl-National Renewable Energy Templates
- COM (2005) 628 final: Biomass Action Plan
- COM (2005) 265 final: Green Paper on Energy Efficiency or Doing More with Less
- COM (2003) 453 final 2003/0172: Proposal for a Directive on establishing a framework for the setting of Eco-design requirements for Energy-Using Products and amending Council Directive 92/42/EEC
- COM (2003) 739 final: Directive on End-use efficiency and Energy Services (approved 13th December 2005)
- EU Directive 2002 /91/EC: Directive on the Energy Performance of Buildings
- EU Directive 2001 77/EC: Directive on Electricity Production from Renewable Energy Sources
- COM (2001) 508 Final: The European Climate Change Program (ECCP
- COM (2000) 769: Green Paper: Towards a European strategy for the security of energy supply

APPENDIX B – CLARE ENERGY & EMISSIONS BALANCE 2006

B.1 Clare Energy Balance

B.1.1 Total Final Consumption and Emissions by Fuel

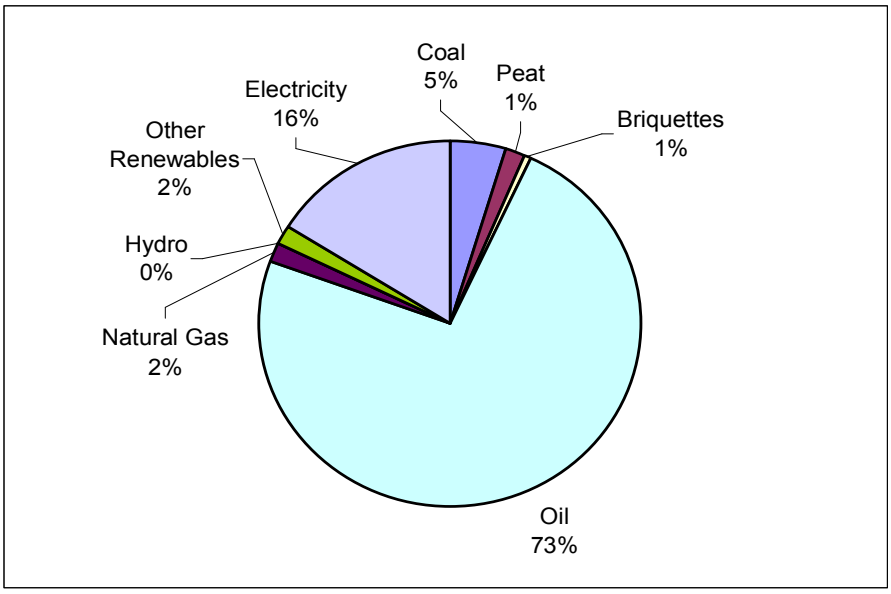


Chart B.1: Total Final Consumption by Fuel, Clare County, 2004

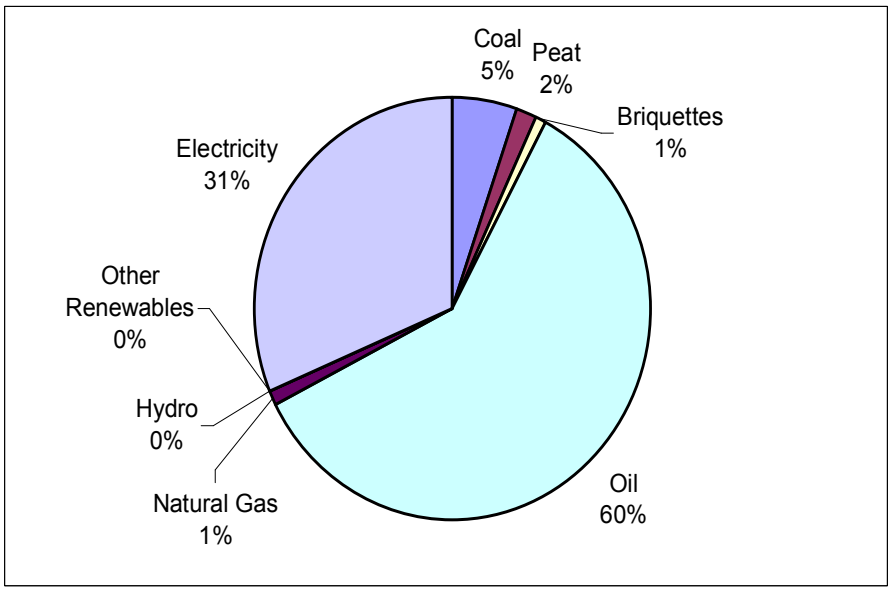


Chart B.2: CO_2 Emissions by Fuel, Clare County, 2004

- From the Charts above it can be seen that oil accounts for the largest proportion of TFC in County Clare, and also is the highest contributor in terms of CO_2 emissions.
- While Electricity only accounts for 16% of TFC it accounts for over 30% of emissions, due to its high emissions factor.
- Renewables and Hydro currently make a minor contribution to consumption with the balance being made up of solid fuels and natural gas.

B.1.2 Total Final Consumption and Emissions by Sector

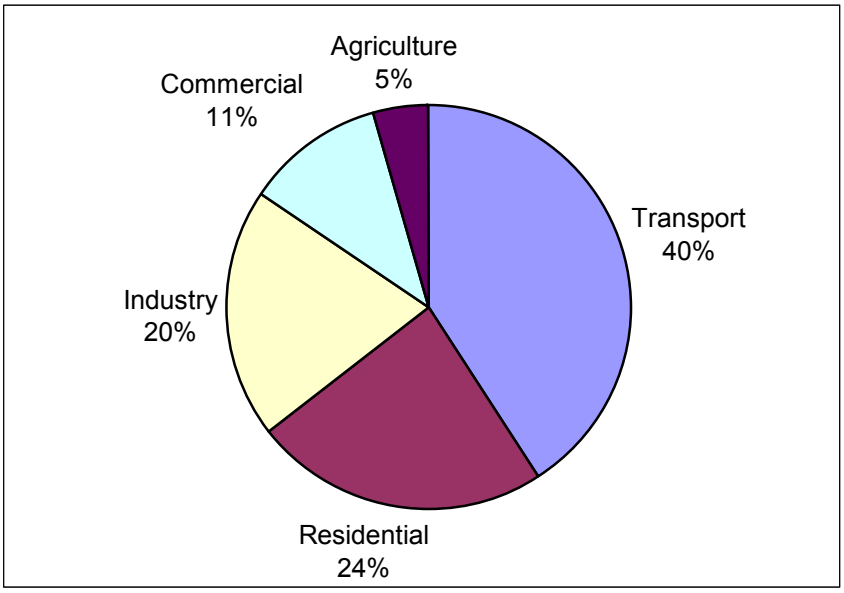


Chart B.3: Total Final Consumption by Sector, Clare County, 2004

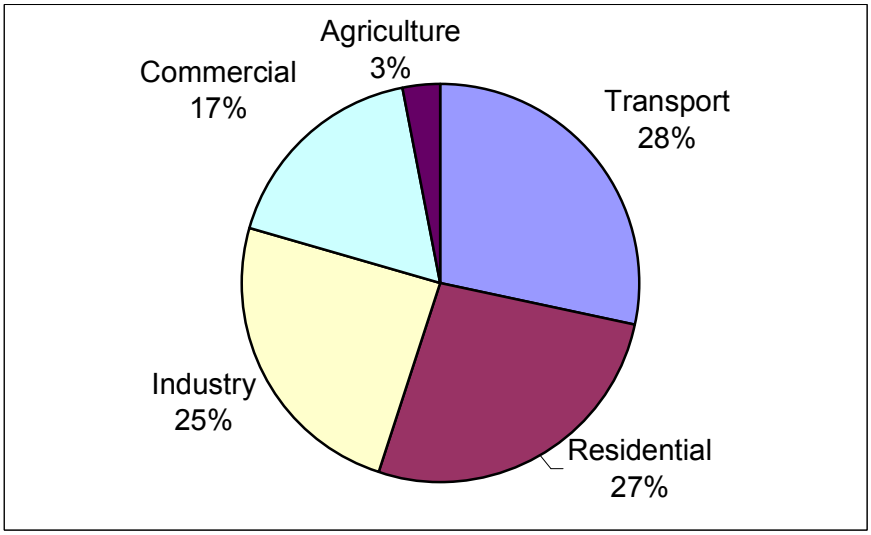


Chart B.4: CO_2 Emissions by Sector, Clare County, 2004

- Clearly the Transport Sector, in 2004, has the highest consumption in energy terms in the County, at 40%. It also currently accounts of 28% of CO_2 emissions.
- The Residential Sector is the next highest contributor in terms of emissions, at 27%, while it consumes 24% of TFC in the County.
- The Industrial Sector accounted for 20% of consumption in 2004 and one quarter of CO_2 emissions.
- The Commercial Sector currently only accounts for 17% of emissions
- Agriculture has the lowest consumption of energy and lowest emissions, in energy terms, within the County.

B.1.3 Environmental Indicators

Table B.1: Environmental Indicators for Clare County

	1991		2000		2004	
Indicator	**Ireland**	**Clare**	**Ireland**	**Clare**	**Ireland**	**Clare**
Population (000)	3,525.7	90.9	3,780.0	100.7	4,043.8	105.0
TFC Fuel Consumed (GWh)	85,662.7	2,302.2	123,593.0	3,406.8	136,718.0	3,806.3
Energy Related Emissions (kt-CO_2)	31,244.9	836.1	41,920.3	1,172.8	43,041.7	1,206.9
GVA (€million)	34,092.0	847.7	91,458.0	2,202.3	132,481.0	2,816.8
TFC/GVA (kWh/€thousand)	2,512.7	2,715.7	1,351.4	1,546.9	1,032.0	1,351.3
TFC/Capita (kWh/ Inhabitant)	24,296.5	25,321.3	32,696.6	33,830.8	33,809.3	36,236.5
CO_2 Emissions / Capita (T CO_2 / Inhabitant)	8.9	9.2	11.1	11.6	10.6	11.5

Table B.1 provides a concise summary of the status of energy consumption and emissions in the County. Key points of note are

- Annual Total Final Consumption (TFC) per Gross Value Added (TFC/GVA) is lower than the National Average.
- The TFC per capita in the County is above the National average, consistently since 1991.
- Emissions per capita are also higher than the National average. This is primarily influenced by the fuel mix with a very strong dependence on oil in the County.
- TFC and CO_2 emissions have increased by 65% and 44% respectively between 1991 and 2004, but GVA has increased by 232%.

B.2.1 Total Final Consumption by Fuel

Table B.2: Total Final Consumption, Clare County, (1990 – 2015)

GWh	1990	1995	2000	2002	2004	2005	BAU 2010	BAU 2015
Coal	258.5	118.3	170.6	165.6	183.0	165.8	101.2	79.1
Peat	172.6	148.5	55.0	54.3	55.1	50.5	32.7	21.7
Briquettes	50.0	38.0	37.8	35.2	27.9	25.6	16.6	11.0
Oil	1,420.4	1,746.1	2,544.8	2,708.0	2,800.7	2,883.0	3,422.6	3,787.9
Natural Gas	0.0	0.0	3.5	20.6	65.0	83.9	109.7	130.9
Hydro	34.0	40.8	45.9	51.8	65.8	65.6	64.6	63.6
Electricity	320.7	399.7	549.2	603.2	608.9	631.4	757.2	791.9
TFC	2,256.2	2,491.4	3,406.8	3,638.8	3,806.3	3,905.7	4,504.6	4,886.1

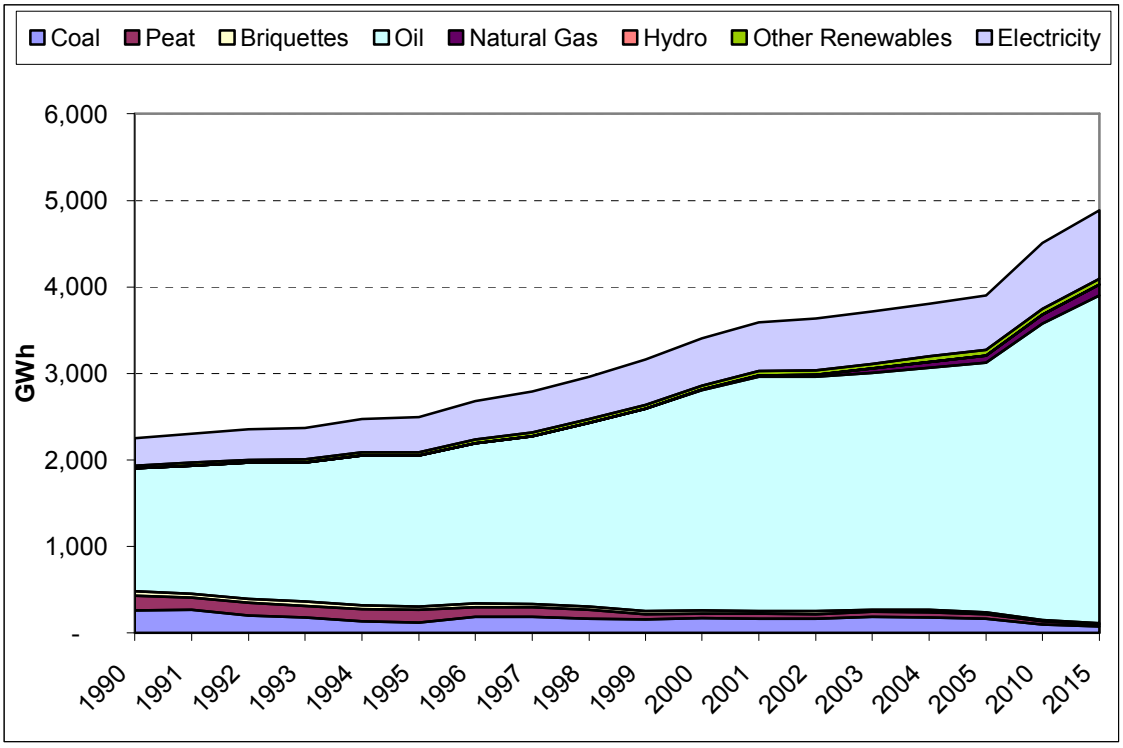


Chart B.5: Total Final Consumption by Fuel, Clare County, (1990 – 2015)

B.2.2 Total Final Consumption by Sector

Table 10.4: Total Final Consumption by Sector, Clare County, (1990 – 2015)

GWh	1990	1995	2000	2002	2004	2005	BAU 2010	BAU 2015
Transport	634.2	772.6	1,255.2	1,464	1,552	1,578.1	2,007.4	2,181.2
Residential	646.9	661.4	789.2	818.9	898.3	902.3	997.7	1,075.1
Industry	567	577.5	788.5	778.9	765.3	823.5	803.3	894.3
Commercial	265.8	324.7	392.2	397.7	417.7	432.9	527.7	574.1
Agriculture	142.3	155.2	184	181.1	173.2	168.8	168.5	161.4
Total	2,256.2	2,491.4	3,409.1	3,640.6	3,806.5	3,905.7	4,504.6	4,886.1

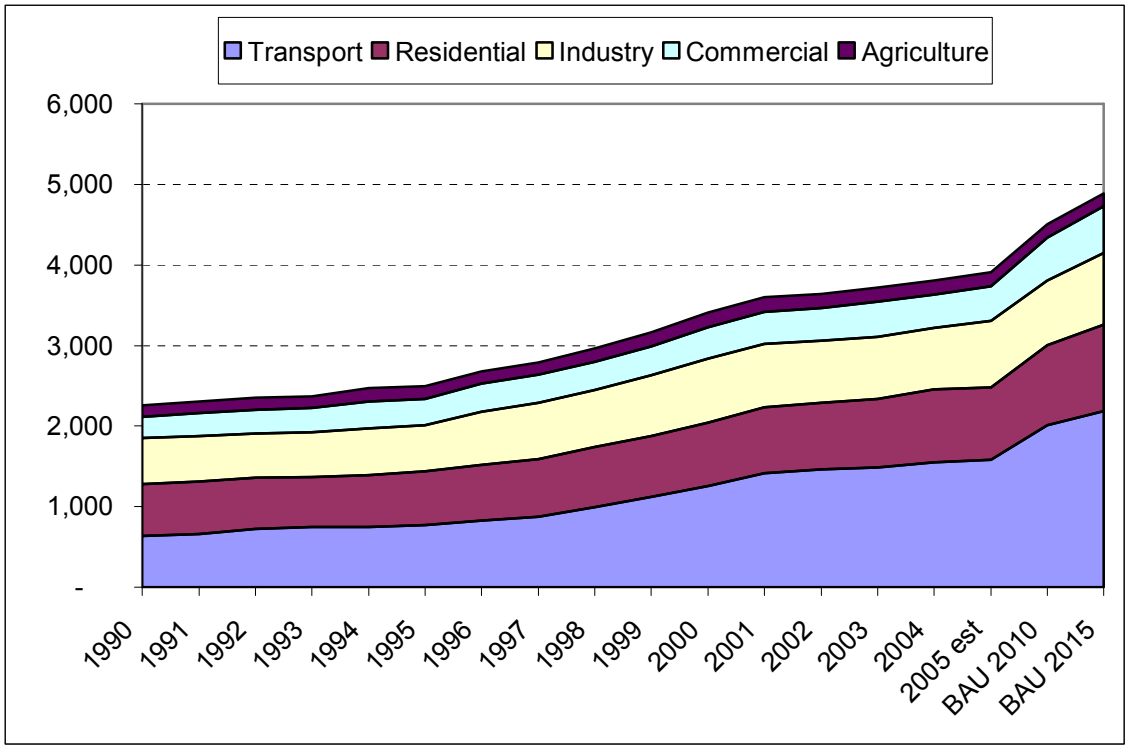


Chart B.7: Total Final Consumption by Sector, Clare County, (1990 – 2015)

B.3.1 CO_2 Emission by Fuel

Table 10.6: CO_2 Emissions by Fuel, Clare County, (1990 – 2015)

kT CO_2	1990	1995	2000	2002	2004	2005 est	BAU 2010	BAU 2015
Coal	88.0	40.3	58.1	56.4	62.3	56.5	34.5	27.0
Peat	64.6	55.6	20.6	20.3	20.6	18.9	12.3	8.1
Briquettes	17.8	13.5	13.5	12.5	9.9	9.1	5.9	3.9
Oil	363.5	447.6	654.3	696.5	721.1	740.1	878.6	972.4
Natural Gas	0.0	0.0	0.7	4.1	12.8	16.6	21.7	25.9
Hydro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other RES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	294.4	357.0	425.7	432.6	380.0	394.1	472.6	494.3
Total	828.3	914.0	1,172.8	1,222.5	1,206.9	1,235.3	1,425.6	1,531.5
Kyoto Target (1990 + 13%)	936.0	936.0	936.0	936.0	936.0	936.0	936.0	936.0

Analysis of CO_2 emissions related to fuel use in the County provides the following indicators:

- Oil and electricity account for the greatest proportion of Emissions and have shown the greatest increases. Emissions from oil use have doubled since 1990 from 363 kT CO_2 to 740 kT CO2 in 2005. Electricity, meanwhile accounted for 34% more emissions in 2005 than it did in 1990.
- Emissions from solid fuels have reduced significantly, in line with their decreasing use as fuels in the County.
- The introduction of Natural Gas into the County in 2000 saw emissions rise from 0.7 kT in 2000 to 16.6 kT in 2005.

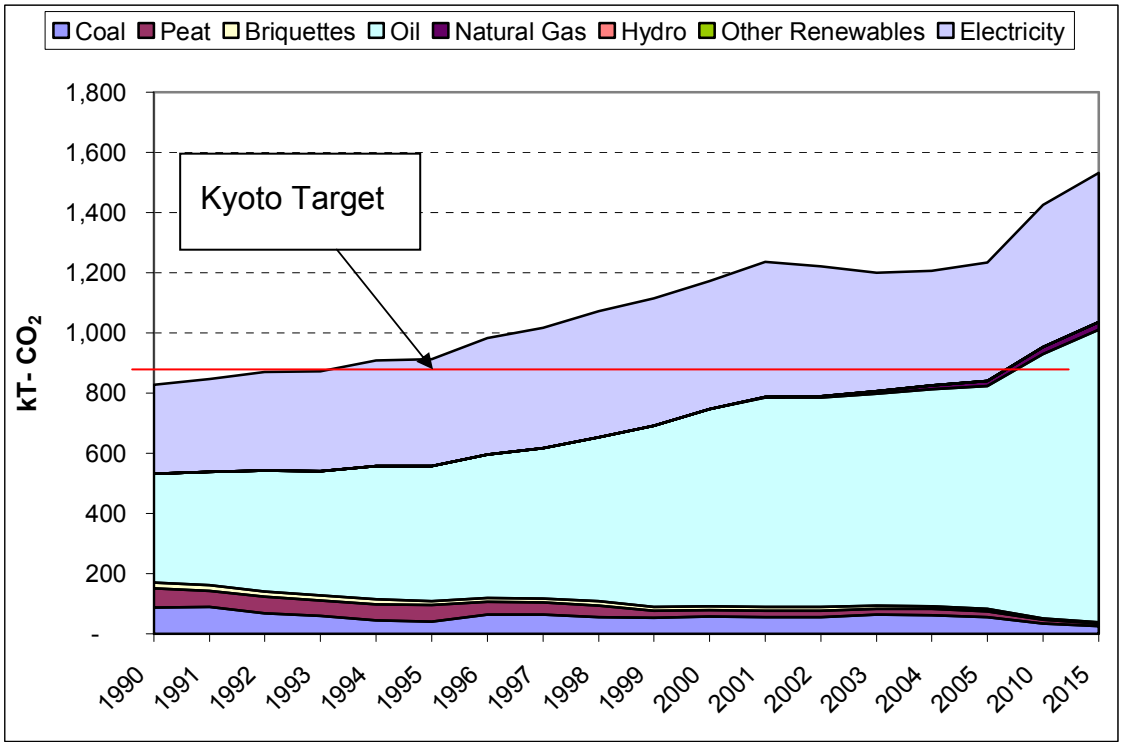


Chart B.9: CO_2 Emissions by Fuel, Clare County, (1990 – 2015)

10.3.2 Emission by Sector

Table B.8: CO_2 Emissions by Sector, Clare County, (1990 – 2015)

kT CO_2	1990	1995	2000	2002	2004	2005 est	BAU 2010	BAU 2015
Transport	168.7	205.9	332.2	346.3	341.9	410.4	515.6	586.5
Residential	283.7	280.5	311.6	324.8	320.6	316.9	328.8	341.7
Industry	216.4	235.4	288.1	300.3	296.4	227.3	259.2	273.0
Commercial	131.0	159.6	204.8	213.4	210.7	250.0	292.0	302.0
Agriculture	28.5	32.6	36.2	37.7	37.2	30.7	29.9	28.4
Total	828.3	914.0	1,172.8	1,222.5	1,206.9	1,235.3	1,425.6	1,531.5
Kyoto Target 1990 + 13%	936.0	936.0	936.0	936.0	936.0	936.0	936.0	936.0

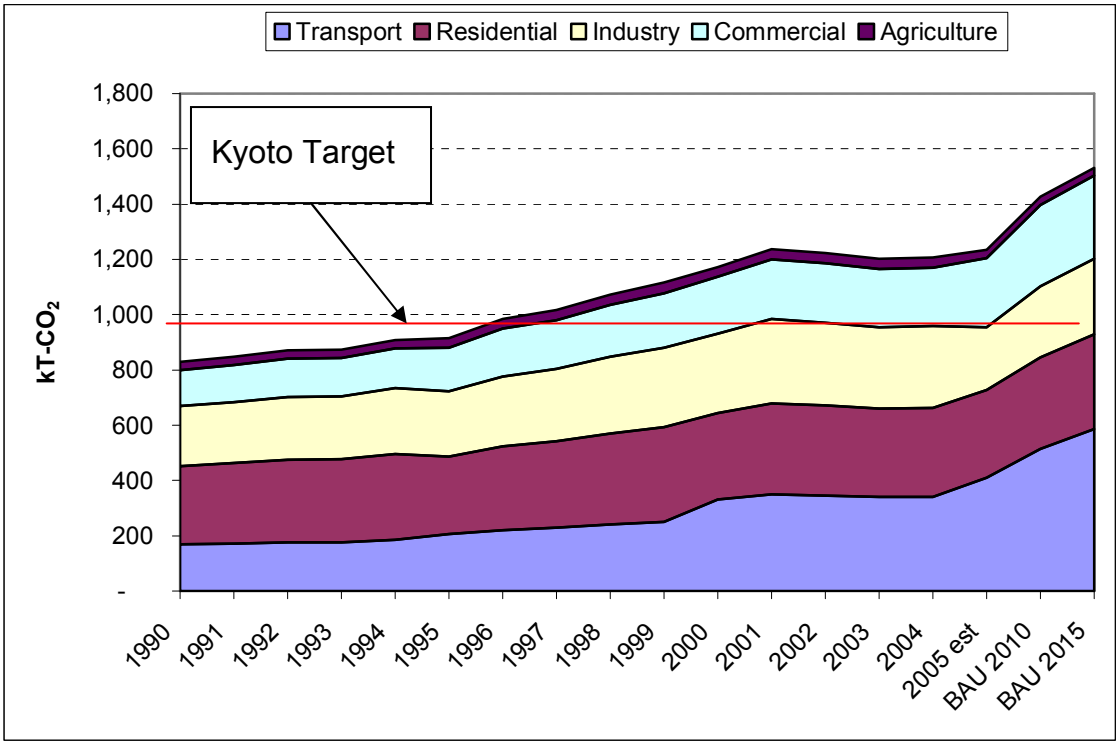


Chart 10.11: CO_2 Emissions by Sector, Clare County, (1990 – 2015)

B.4 Response to Kyoto

B.4.1 The size of the problem

Table B.10: Analysis of Compliance with Kyoto and Potential Costs, Clare County.

	Emissions kT CO_2	**Kyoto Target Exceedance** kT CO_2	**Projected Cost of CO2/ton Trading Price** (€)	**Annual Carbon Levy** (€millions)
1990	828.3	0.0	-	0.0
Kyoto Target (1990 + 13%)	936.0	0.0	-	0.0
1995	914.0	0.0	-	0.0
2000	1,172.8	236.8	-	0.0
2002	1,222.5	286.5	-	0.0
2004	1,206.9	270.9	-	0.0
2005 est	1,235.3	299.3	27	8.0
BAU 2010	1,425.6	489.6	35	17.1
BAU2015	1,531.5	595.5	45	26.8

It can be seen from the above Table that County Clare exceeded its Kyoto Target before 2000 and the BAU scenario would see it generating approximately 490 kT CO_2 above its Kyoto Limit by 2010. Based on a potential price of €35 per tonne of CO_2 this could equate to a Carbon Levy of over €17 million per annum.

APPENDIX C – CLARE CLIMATE CHANGE STRATEGY 2006

C.1 Summary of CO_2 Reductions

The Energy and Emissions Balance for Limerick and Clare analysed the energy production and use within Clare County and also assessed the associated CO_2 emissions. This assessment showed that oil and electricity were the dominant fuels, in terms of use and emissions levels. The transport sector was shown to be the sector which had the greatest growth in terms of emissions and fuel usage. Based on this and other data a set of Quantified Indicative Reductions were proposed for Clare County, as shown in the following Table.

Table C.1: Quantified Indicative Reductions – Clare County

Overall QIRS by sector	**Quantified Indicative Reductions Proposed** ('000 T-CO_2)
Energy Production & Supply	188
Transport	88
Built Environment & Residential	30
Industry, Commercial, & Services	72
Agriculture	80
Waste	28
Sinks (Land Use Change & Forestation)	25
Total	510

The following tables set out the actions that

C.2 Summary of Actions

Table C.2: Summary of CO_2 Reductions, Investment and Abatement Cost – Clare County

Sector	CO_2 Reduction (000 Tonnes)		Investment Cost (€ m)		Indicative Abatement Cost (€ / Tonne)	
	2010	**2015**	**2010**	**2015**	**2010**	**2015**
Energy Prod & Supply	208.4	306.9	130.8	197.4	627	643
Transport	50.6	66.6	7.0	12.0	138	180
Built Environment	38.4	51.9	25.4	41.8	662	806
Ind and Comm Services	47.0	49.2	7.0	7.0	148	142
Agriculture	12.0	22.2	6.6	6.8	549	304
Waste	5.4	5.4	1.0	0.1	186	-
Total	**361.8**	**502.1**	**177.7**	**265.**	**491**	**527**
Target	489	595				
Gap to Target	127.2	92.9				

Table C.2 summaries the data and results from the different sectors which were reviewed in Clare County. It can be seen that based on the standard measures which are proposed that the Kyoto Target will not be reached.

The Energy Production and Supply measures can make the biggest contribution in the short term. For the full Kyoto target to be reach greater contributions will be required from the other sectors, in particular transport.

C.3 Conclusions

C.3.1 Individual Responsibility

The Clare Energy and Emissions Balance calculated indicators for reductions which would be require per person to achieve the Kyoto Target. This have been updated to include the individual reductions required to meet the expected reductions projected in this study. These results are shown in the following Table.

Table 5.38: Individual Responsibility – Clare County

Indicator	1990	Kyoto Target (1990 + 13%)	2004	2010	Reduction Required To Reach Kyoto Target	Reduction Achieved through Standard Measures
Population (000)	91.0	-	105.0	112.7		
TFC (GWh)	2256.2	-	3,806.3	4504.6		
Energy Related Emissions ('000 T-CO_2)	828.3	936.0	1,186.1	1425.6	489	365
TFC/Capita (kWh/Person)	24,796.4	-	36,236.4	39,984.0		
CO2 Emissions / Capita (T CO_2/Person)	9.1	9.1	11.3	12.7	4.7	3.5

C.3.2 Carbon Levies

The Energy and Emissions Balance also calculated the carbon levies that could arise by failing to meet the Kyoto Requirements. These have been compared to the levy that might arise after the standard measures have been implemented in the following Table.

Table 5.39 : Carbon Levies in County Clare (Business as Usual and with Standard Measures)

Carbon Levy (€ / Tonne CO_2)	**2010**	**2015**
	€ 35.00	€ 45.00
Levy BAU (€)	€ 17,100,000	€ 26,800,000
Levy Standard Measures (€)	€ 4,500,000	€ 4,200,000