

**LIMERICK CLARE**  
**energy agency**

**University of Limerick,  
Plassey,  
Limerick,**  
Tel: +353 -61- 234296  
Fax: +353 -61-202572  
Email: [info@lcea.ie](mailto:info@lcea.ie)

## **Limerick Clare Climate Change Strategy**





### Investors

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County Limerick



#### **University of Limerick,**

Plassey,  
County Limerick



### Report Authors and researchers

#### **Tipperary Energy Agency Ltd.**

Church St.  
Cahir,  
County Tipperary  
T: 052 43090  
W: [www.tea.ie](http://www.tea.ie)



### Report Commissioned & Edited By

#### **Limerick Clare Energy Agency**

Foundation Building  
University of Limerick  
Limerick.



T: 061 234296

E: [info@lcea.ie](mailto:info@lcea.ie)

W: [www.lcea.ie](http://www.lcea.ie)





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## **Executive Summary**

### Introduction

The aim of the Climate Change Strategy for Limerick and Clare is to clearly identify the solutions to the challenge of reducing energy related emissions and to outline the actions to be taken to meet the requirements under the Kyoto Protocol. Estimates of the impact of these actions in terms of CO<sub>2</sub> reductions have been made and areas for future work identified.

The general approach that has been taken is to group the actions and measures which should be implemented in a similar fashion as that adopted in the National Climate Change Strategy. This allows for National comparisons. It was hoped that the National Climate Change Strategy consultation process would have been on-going in parallel with this study but this has not occurred.

### Study Approach

The approach taken in the study was to present the data by County in separate Tables and Figures. This allows for analysis of energy and emissions within each County and also on a Study Area basis. It is hoped that in the future data for North Tipperary can be added to this data to provide a complete analysis for the Mid West Region of Ireland.

The general approach that has been taken is to group the actions and measures which should be implemented in a similar fashion as that adopted in the National Climate Change Strategy. This allows for National comparisons. It was hoped that the National Climate Change Strategy consultation process would have been on-going in parallel with this study but this has not been possible.

Actions and measures have been grouped into standard and extraordinary measures. Standard measures are defined as those which can be implemented based on current political, social and regulatory frameworks. Extraordinary measures are those measures which would require significant changes in approach and structures locally, regionally and nationally.

The Limerick Clare Energy and Emissions Balance used a top down approach in terms of estimating Total Final Consumption and CO<sub>2</sub> emissions by fuel and by sector in the study area. This approach was beneficial in determining the scale of the problem which needs to be addressed in the region and the relevant trends. The Climate Change Strategy is generally based on a bottom up approach which involves analysis of the existing work, actions and projects within the region in relation to energy efficiency and renewable energy and estimating the CO<sub>2</sub> emission reduction impacts these will have.

Moneypoint ESB power station, the largest electricity producer in the country and Aughinish Alumina, Irish Cement and Shannon Airport, make up some of the highest energy users in the country, are all located in the study region. The four sites have been estimated to be responsible for over 12,300,000 Tonnes of CO<sub>2</sub> per annum. All these sites except Shannon Airport are dealt with under the National Emissions Trading scheme and therefore the LCEA will have a limited input to action in this area. To avoid the data from these large sites skewing the data from other sectors it is not presented with the County data. This allows for a more focused approach on the other sectors and end users within the region.

It is acknowledged that the approach taken has had to include a number of assumptions and methodologies which affect the accuracy of the data presented. However, it is



important to note that access to relevant data at a County level is limited and a balance between accuracy, resources and impact had to be achieved by the project partners.

### Key Results

Analysis has been completed for Clare County, Limerick County and Limerick City. Clare County and Limerick County energy related emissions amount to 85% of total emissions for the study area. The Energy and Emissions Balance indicated the level of excess above the Kyoto target by 2010 to be:-

- County Clare: 489,000 tonnes CO<sub>2</sub>
- County Limerick: 562,000 tonnes CO<sub>2</sub>
- Limerick City: 150,000 tonnes CO<sub>2</sub>

The analysis conducted has indicated that, based on a range of standard measures, the Kyoto targets will not be met. For each area, the gap between meeting the Kyoto Requirements is projected to 25% below the Kyoto Target.

Table 1 below illustrates the quantity of energy related emissions (,000 tonnes of CO<sub>2</sub>) in the study area. The table shows that by 2010 the study area could be 1,203,000 tonnes of CO<sub>2</sub> over the Kyoto target, and should this progress on a “Business As Usual” basis to 2015 the level of excess could be 1,478,000 tonnes. The financial implications for the study area are also identified. The reductions that are sought in order to avoid this excess are shown in Table 2.

**Table 1: Energy Emissions (CO<sub>2</sub>) and potential cost for study area**

	Clare County			Limerick County			Limerick City		
	Emissions kT-CO <sub>2</sub>	Kyoto Target Excess kT-CO <sub>2</sub>	Annual Carbon Levy millions	Emissions kT-CO <sub>2</sub>	Kyoto Target Excess kT-CO <sub>2</sub>	Annual Carbon Levy millions	Emissions kT-CO <sub>2</sub>	Kyoto Target Excess kT-CO <sub>2</sub>	Annual Carbon Levy millions
<b>1990</b>	828.3	0	0	989	0	0	418.6	0	0
<b>1995</b>	914	0	0	1,094	0	0	466	0	0
<b>2000</b>	1,172	236.8	0	1,374	257.2	0	541	68.9	0
<b>2002</b>	1,222	286.5	0	1,437	320	0	537	64.3	0
<b>2004</b>	1,206	270.9	0	1,421	304.2	0	531	58.2	0
<b>2005 est.</b>	1,235	299.3	€ 8.0	1,456	338.5	€ 9.1	543	70.4	€ 1.9
<b>BAU 2010</b>	1,425	489.6	€ 17.1	1,680	562.8	€ 19.7	623	150.8	€ 5.3
<b>BAU 2015</b>	1,531	595.5	€ 26.8	1,806	688.3	€ 31.0	667	194	€ 8.7
<b>Kyoto Target</b>	936			1,118			473		



**Table 2 Summary of CO<sub>2</sub> Reductions in Study Area.**

'000 tonnes CO <sub>2</sub>	Clare		Limerick		Limerick City	
	2010	2015	2010	2015	2010	2015
Energy Production & Supply	208.4	306.9	255.3	353.7	45.0	54.0
Transport	50.7	66.5	58.2	76.9	24.0	28.8
Built Environment	38.4	51.9	35.5	45.5	15.0	18.0
Industry/Commercial Services	47.0	49.2	55.4	58.0	22.5	27.0
Agriculture	12.0	22.2	16.1	29.4	7.5	9.0
Waste	5.4	5.4	19.3	19.3	4.5	5.4
Total	361.8	502.1	439.7	582.8	118.5	142.2
Target	489.0	595.0	562.0	688.0	150.0	194.0
Gap to Target	127.2	92.9	122.3	105.2	31.5	51.8

Table 2 shows that significant progress toward meeting out Kyoto target can be achieved using standard measures. However in order to avoid the financial implications outlined above some extra ordinary measures must be employed. For each sector in Table 2 specific actions such as renewable energy development, transport initiatives, energy efficiency measures etc. were assessed to determine their impact in terms of CO<sub>2</sub> reductions.

### Common Issues

It is clear that locally, regionally and nationally extraordinary measures will be required to reduce CO<sub>2</sub> emissions and to meet our international commitments under the Kyoto Protocol. The standard measures which have been discussed within this report clearly are not enough. The significant savings in terms of CO<sub>2</sub> projected going forward are expected to arise as a result of private investment in the renewable energy sector. While the private sector can make an impact there is an immediate need for clearly structured and well supported national and regional programmes to meet the challenges of the Kyoto targets.

Some common issues identified within the study area are:-

- A key restriction for the development of renewable energy electricity projects continues to be access to the National Grid for sale of electricity. Continued pressure needs to be applied to facilitate the connection of future projects to the grid.
- The transport sector was shown to account for the highest level of CO<sub>2</sub> emissions. The potential for achieving real reductions in this sector is confined by the growing ownership of cars and increased freight due to economic growth, and in the rural areas by the lack of infrastructure. However, it is perhaps the single most important area where, given appropriate services, individuals can make significant reductions by:



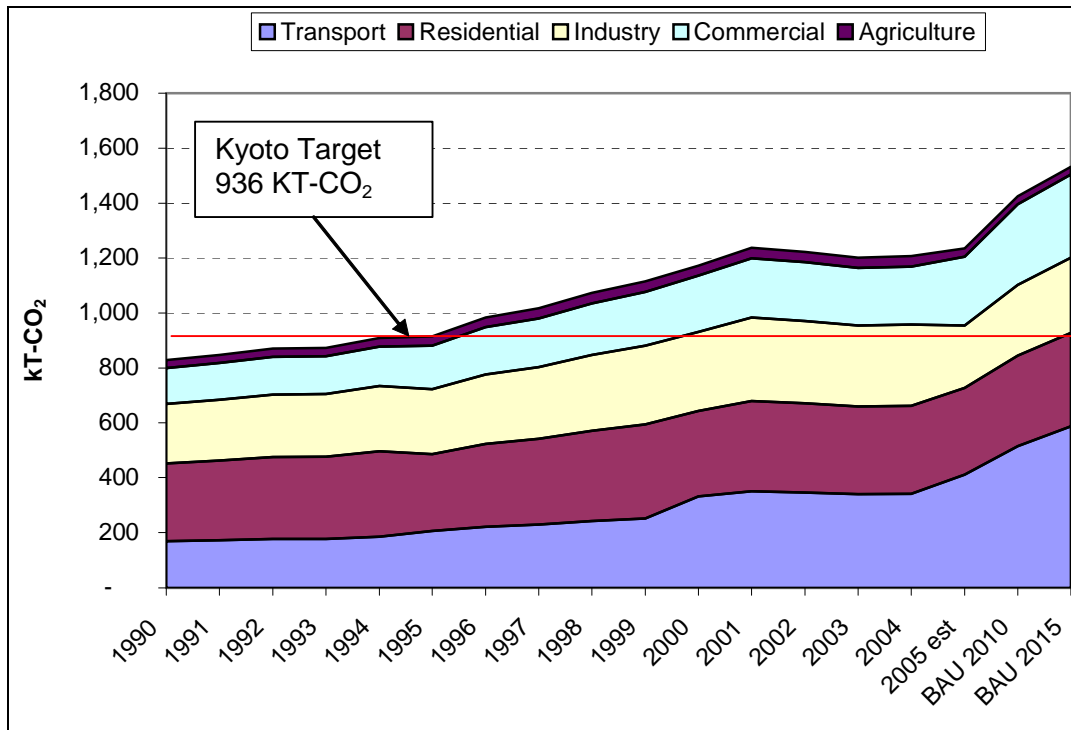
- Increased use of energy efficient modes of transport (walking, cycling, bus etc.)
  - Purchase of energy efficient vehicles
  - Switching to the use of green fuels
  - Car pooling
- The supply infrastructure for wood heating projects will present common issues not only in Clare and Limerick but nationally. The work and experience from the Clare Wood Energy Project should be used to provide a model in the region for future developments
- While the building regulations have improved dramatically nationally and the implementation of the Energy Performance of Buildings Directive is welcome it is vital that these are implemented fully to achieve the full potential savings.
- The Industrial Sector has already achieved significant reductions in energy consumption per unit of production. However, increased use of green energy through development of biomass and solar heating projects presents a particular opportunity in the region. This also applies to the Commercial Sector. A target campaign of energy awareness, monitoring and targeting and energy auditing within these sectors is a priority for the future.
- Some provision has been allowed for the development of Tidal in the region but for the full potential to be realised significant investment will be required.
- The clearest signal from the analysis to date is that all sectors will have to make a contribution to reducing emissions and no one sector or action will meet the requirements in terms of CO<sub>2</sub> reductions.

## County Clare

The following table and chart illustrates the dramatic increase in energy related emissions in the county since 1990. The chart is analysed by economic sector.

**Table 3 County Clare, Evolution of Energy Emissions (CO<sub>2</sub>) 1990 – 2015**

kT CO <sub>2</sub>	1990	1995	2000	2002	2004	2005 est	BAU 2010	BAU 2015
<b>Transport</b>	168.7	205.9	332.2	346.3	341.9	410.4	515.6	586.5
<b>Residential</b>	283.7	280.5	311.6	324.8	320.6	316.9	328.8	341.7
<b>Industry</b>	216.4	235.4	288.1	300.3	296.4	227.3	259.2	273.0
<b>Commercial</b>	131.0	159.6	204.8	213.4	210.7	250.0	292.0	302.0
<b>Agriculture</b>	28.5	32.6	36.2	37.7	37.2	30.7	29.9	28.4
<b>Total</b>	828.3	914.0	1172.8	1222.5	1206.9	1235.3	1425.6	1531.5



**Chart 1 County Clare, Evolution of Energy Emissions (CO<sub>2</sub>) 1990 - 2015**

- The Transport sector has shown the highest increase in level of emissions since 1990 with a 143% increase to 2005. This mirrors the increased use of oil as a fuel also.
- Emissions from the residential sector have remained relatively constant with an 11% increase since 1990. This reflects the increase energy efficiency of buildings and heating systems used
- There was a 60% increase in emissions from the Commercial sector since 1990 in the County.

The gap to the 2010 target in County Clare is projected to be 123,000 Tonnes of CO<sub>2</sub>. As can be seen from Table 6.2 the main contributor to the reductions in the County is from the Energy Production and Supply Sector. Some key findings from this sector include:

- By 2010 it is expected that 71MW of large scale wind will be installed in the County, increasing to 87MW by 2015
- Renewables (large, medium and small scale) will make the greatest contribution in terms of CO<sub>2</sub> reductions as they result in no or minimal CO<sub>2</sub> emissions compared to fossil fuels.
- Wood biomass from forestry thinnings should take a significant step forward in 2007 as a result of the Clare Wood Energy Project. This model should present opportunities for replication in the future.



- The potential for the development of CHP within the County will be restricted by the limited natural gas network and limited installations with sufficient heat demand, but specific action should be taken to maximise its use

Within the built environment the significant reductions are due to savings achieved as a result of legislation and improved building regulations. It is estimated that there will be over 21,000 new houses built in County Clare between 2002 and 2015. Potential savings achievable by these houses compared to ones built prior to the 2002 building regulations are approximately 20,000 Tonnes by 2010.

Forestry thinnings from the private sector in Co. Clare has a potential wood energy supply of 80,000 Tonnes of wood chips. Realising only 10% of this for wood energy use in 2010 could provide 27 GWh<sub>th</sub> of energy per annum in the region. If the Coillte forestry were also to be used as a resource (approximately 23,000 ha in 2004) the wood energy resource would be almost doubled. Already 6 potential sites have been identified for development of wood heating projects..

The agricultural sector in Co. Clare currently has limited production of arable crops and this is unlikely to change dramatically in the future. It is likely therefore that resources for liquid biofuels will be imported into the County. However, the County could benefit from experience in Co. Limerick in relation to the growing of Miscanthus as an energy crop.

By exceeding its 2010 limit in terms of CO<sub>2</sub> emissions related to energy the County could face a relative carbon levy of €17M in 2010. If the savings identified in the report are achieved this could reduce to €4.3M.

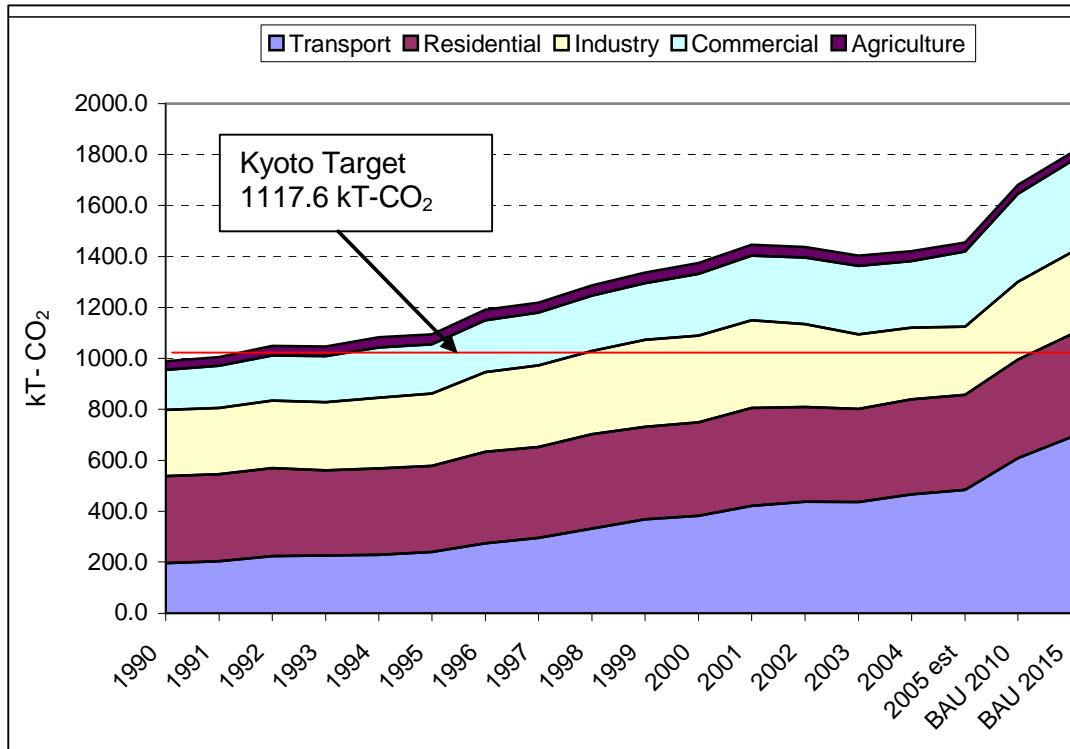
The indicative abatement cost to achieve these reductions has been estimated to be in the region of €450/Tonne.

## County Limerick

The following table and chart illustrates the dramatic increase in energy related emissions in the county since 1990. The chart is analysed by economic sector.

**Table 4 County Limerick, Evolution of Energy Emissions (CO<sub>2</sub>) 1990 – 2015**

kT CO <sub>2</sub>	1990	1995	2000	2002	2004	2005 est	BAU 2010	BAU 2015
<b>Transport</b>	194.9	239.6	381.4	437.3	465.1	483.8	607.8	691.6
<b>Residential</b>	342.3	338.9	367.0	372.4	374.6	373.6	387.6	403.0
<b>Industry</b>	260.5	284.3	341.5	326.0	281.9	267.9	305.5	321.9
<b>Commercial</b>	157.5	192.4	242.3	260.4	261.2	294.7	344.3	356.1
<b>Agriculture</b>	33.9	39.1	42.6	41.5	39.0	36.2	35.3	33.4
<b>Total</b>	989.0	1,094.3	1,374.8	1,437.6	1,421.8	1,456.1	1,680.5	1,805.9



**Chart 2 County Limerick, Evolution of Energy Emissions (CO<sub>2</sub>) 1990 – 2015**

- The Transport sector has shown the highest increase in level of emissions since 1990 with a 148% increase to 2005, and predicted increase of 255% by 2015.
- Emissions from the residential sector have remained relatively constant with an 10% increase since 1990. This reflects the increase energy efficiency of buildings and heating systems.
- The Commercial sector has shown a 87% increase in emissions since 1990.

The gap to the 2010 target in County Limerick is projected to be 562,000 Tonnes of CO<sub>2</sub> and this is projected to reduce to 69,000 Tonnes by 2015. Energy Production and Supply will result in the greatest CO<sub>2</sub> reductions, another indicator that this sector is responding to the need to develop alternatives in this area.

Some key findings for County Limerick include:

- By 2010 it is expected that 94MW of large scale wind installed in the County, increasing to 115MW by 2015
- A number of small scale hydro projects have been completed in the area and specific expertise in the field of energy from poultry wastes has been developed.
- The development of Miscanthus as an energy crop is being driven Nationally from Limerick. Already 150 ha have been planted and this is expected to increase significantly in the future.

Over 10,000 new houses will be developed in the county between 2002 and 2010. Assuming all are built to the 2002 Building Regulations this would result in CO<sub>2</sub> savings of 16,000 Tonnes by 2010. Proper enforcement and inspection will become ever more important to ensure that the regulations are complied with.



The agricultural sector in Co. Limerick has a shown considerable interest in the development of Miscanthus as an energy crop. Similar to the wood energy project in County Clare a key barrier will be the issue of fuel supply infrastructure. In addition, support will be required to overcome the high initial investment costs for the crop.

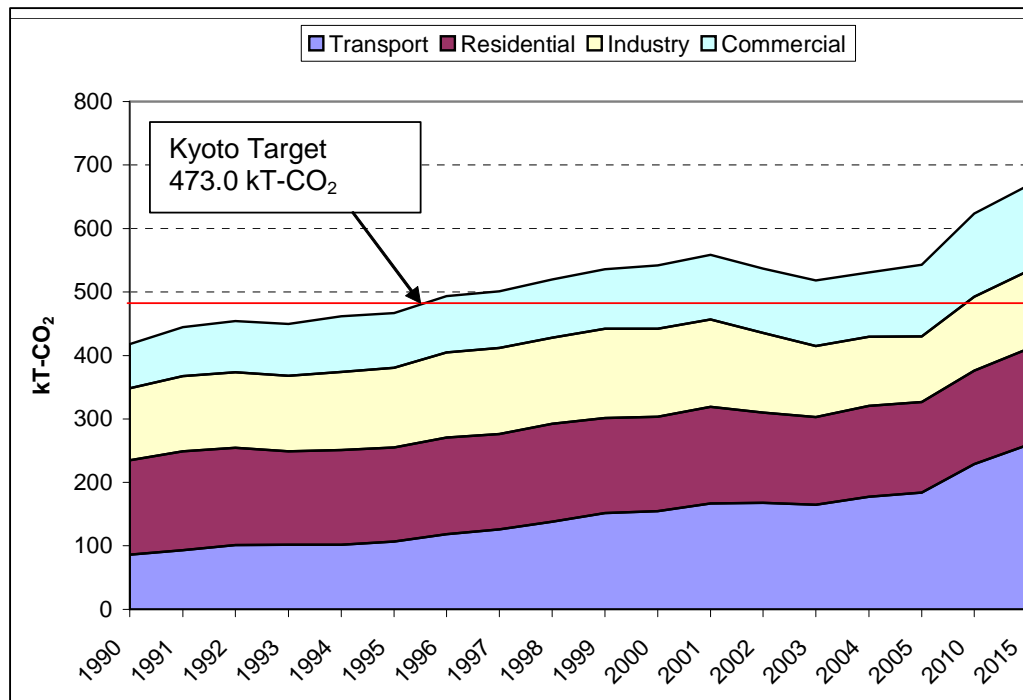
By exceeding its 2010 limit in terms of CO<sub>2</sub> emissions related to energy the County could face a relative carbon levy of €20M in 2010. If the savings identified in the report are achieved this could reduce to €3.8M. The indicative abatement cost to achieve these reductions has been estimated to be in the region of €417/Tonne.

### Limerick City

The following table and chart illustrates the dramatic increase in energy related emissions in Limerick City since 1990. The chart is analysed by economic sector.

**Table 5 Limerick City, Evolution of Energy Emissions (CO<sub>2</sub>) 1990 – 2015**

kT-CO <sub>2</sub>	1990	1995	2000	2002	2004	2005 est	BAU 2010	BAU 2015
<b>Transport</b>	86.1	106.4	154.5	167.3	177.4	183.9	228.9	258.5
<b>Residential</b>	148.4	148.8	148.9	143.1	143.6	142.8	147.2	151.9
<b>Industry</b>	113.8	125.5	138.8	125.7	109.0	103.4	116.7	122.0
<b>Commercial</b>	70.2	86.2	99.7	101.2	101.2	113.3	131.1	134.6
<b>Total</b>	418.6	466.8	541.9	537.3	531.2	543.4	623.8	667.0



**Chart 3 Limerick City, Evolution of Energy Emissions (CO<sub>2</sub>) 1990 - 2015**



- The Transport sector has shown the highest increase in level of emissions since 1990 with a 114% increase to 2005, and predicted increase of 200% by 2015.
- The residential sector has seen little or no change in the total emissions in the City since 1990. This is the only sector to see such a trend with the City and surrounding Counties. This reflects increased energy efficiencies within the housing stock and increased use of Natural Gas within this sector.
- The Commercial sector has shown a 61% increase in emissions since 1990.

Limerick City was projected to exceed its Kyoto Target by 150,000 Tonnes of CO<sub>2</sub> in 2010. The range of potential measures possible in the City could reduce this to 45,000 Tonnes by 2010. Limerick City presents different issues in terms of implementing a Climate Change Strategy when compared to the County Areas.

Some key recommendations include: -

- Particular focus on transport is clearly important for the City area. Further innovation in terms of car-pooling, park and ride, increased services and mobility management is needed.
- The built environment within the City, given its higher density, presents opportunities for the development of district heating, communal energy systems etc.
- The focus in terms of renewable energy development will have to be moved from the area of wind, as is the case in the County areas, to biomass, solar and other technologies which are integrated into buildings in particular.
- Combined Heat and Power developments need to be increased

## Conclusions

It has been shown that significant progress can be made within the study region towards meeting the Kyoto targets. However, based on a wide range of standard measures, the total CO<sub>2</sub> savings identified will still be approximately 25% below that required.

The Energy Production and Supply sector is currently carrying the greatest share of CO<sub>2</sub> savings. Further action is required in the other sectors in the near future. In particular the Transport sector will require collective and individual action to achieve savings.

Individual responsibility for energy consumption and emissions will be an important component factor in reaching our Kyoto Targets. Every individual is responsible for the energy that they use at home, at work and in transport. The following table sets out the reductions of CO<sub>2</sub> sought as an individual responsibility.

**Table 6 CO<sub>2</sub> reductions per capita in Limerick & Clare study area.**

Indicator	Clare County	Limerick County	Limerick City
CO <sub>2</sub> Emissions / Capita T CO <sub>2</sub> / person	4.7	4.6	2.8





## 1.0 Regional Climate Change Strategy

### 1.1 Introduction

Climate change has been identified as one of the key challenges facing humanity in the 21<sup>st</sup> Century. National Governments and International organisations have set it as a key priority. A range of National and International studies have been completed to determine the impact of climate change and to propose solutions and measures.

This report is written in response to the Irish National Climate Change Strategy and specifically seeks to identify the measures that can be taken in the counties of Limerick & Clare. The Limerick Clare Energy Agency has commissioned this climate change study.

### 1.2 Climate Change Strategy Structure & Methodology

The general approach taken has been to adopt a similar model and structure to that taken Nationally. This is beneficial in that it allows for the use of National data for benchmarking and analysis while also allowing the Strategy to feed into future National policies.

This report is based on the data and analysis from the Limerick Clare Energy and Emissions Balance (EEB). The EEB produced data on the past, current and predicted energy use by fuel and by sector in the study area. It also analysed the energy related CO<sub>2</sub> emissions by fuel and by sector for the area, again based on past data, current status and future predictions. This important document utilises suitable indicators for energy and environmental performance to be set and identifies the scale of the problem to be addressed. This analysis was completed for Clare County, Limerick County & City.

The format of this report is presented in summary format for the combined study area with detailed analysis being provided for Limerick County, Limerick City and Clare County. Specific technical and economic information in relation to technologies, methodologies and measures is provided as a reference for project developers in the Appendices.

Within each study are the following sections have been address

- Energy Production and Supply
- Transport
- Built Environment
- Industry and Commercial Services
- Agriculture and Forestry
- Waste

For the purposes of this study CO<sub>2</sub> Abatement via sinks has been ignored. This is due to a focus on actions and measures which result in direct reduction in CO<sub>2</sub> emissions. It is acknowledged that Nationally sinks will play a part in meeting the Kyoto target. Further research should be completed in relation to sinks in the study area given the higher than average levels of forestry in the region.

Actions and measures have been grouped into standard and extraordinary measures. Standard measures are terms as those which can be implemented based on current political, social and regulatory frameworks. Extraordinary measures are those measures which would require significant changes in approach and structures locally, regionally and nationally.



The estimated CO<sub>2</sub> savings have been calculated for each section based on standard measures. In addition, indicative investment costs have been developed to allow an initial estimate of Indicative Abatement Cost (€/T) to be calculated.

### 1.3 Aim and Objectives

The Aim of the Strategy is to propose solutions to reduce the CO<sub>2</sub> emissions identified within the Limerick Clare Energy & Emissions Balance. The solutions will enable the study region to meet its commitments under the Kyoto Protocol and to propose measures and actions to address this.

The Objectives of the Strategy are to

- Identify the scale of the climate change problem and suitable actions which can be taken in the study area
- Act as a basis for which all relevant stakeholders can support the development of sustainable energy in the study area
- Provide a basis for future policy in the study area
- Link with and possible influence future policy in the area of climate change.

### 1.4 Investing in The plan

Tackling climate change will require a multi-sectoral approach and strong co-operation from all stakeholders. This report should assist this process.

The Limerick Clare Energy Agency (LCEA) is an example of how coordinated action can support the development of sustainable energy. The Limerick Clare Energy Agency was established by Limerick and Clare County Councils. It is supported by:-

- West Limerick Resources
- Clare Rural Resources Ltd
- Ballyhoura Rural Development

The LCEA will continue to work with a wide range of partners and organisations to ensure that appropriate resources and invested in the actions identified within the strategy. Local, Regional and National support will be required to meet the targets set out in the document.



## 2.0 Energy / Environmental Regulation

### 2.1 International Commitments

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 (CO<sub>2</sub>) 50% of all emissions
- Methane (CH<sub>4</sub>) 18% of all emissions
- Nitrous oxide (N<sub>2</sub>O) 6% of all emissions
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF<sub>6</sub>)

The Protocol sets targets for 39 developed countries and the European Union (EU) as a whole. Overall a target reduction of 5% compared to 1990 emissions within these countries will be achieved. This will be measured in the 2008-2012 period.

**Table 2.1: Kyoto Commitments**

*Source: UNFCCC (2006)*

Country/Region	Commitment	
European Union	8%	Reduction
United States	7%	Reduction
Canada, Japan, Hungary	6%	Reduction
Croatia	5%	Reduction
New Zealand, Russia, Ukraine,		1990 levels
Norway,	1%	Increase
Australia,	8%	Increase
Iceland	10%	Increase
<b>Total Kyoto Commitment</b>		<b>5.2%Reduction</b>

### 2.2 EU Directives

In an international context the EU has taken a positive and proactive approach to the issue of Climate Change . Examples of key Directives and Polices related to energy and the environment include:

- 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)
- COM (2002) /91/EC: Directive on the Energy Performance of Buildings
- COM (2001) 77/EC: Directive on Electricity Production from Renewable Energy Sources
- COM (2001) 508 Final: The European Climate Change Program (ECCP I)/



- COM (2000) 769: Green Paper: Towards a European strategy for the security of energy supply
- COM (1997) 599 final: White Paper: Energy for the future - renewable sources of energy
- Council Directive 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels

## 2.3 Irish Legislation / Regulation

The Irish Government must transpose all EU Directives into Irish Law appropriately and in addition it has specific requirements under the Kyoto Protocol. The Irish National Climate Change Strategy was launched in 2000 as Ireland's response to the Kyoto Protocol. Other relevant legislation and regulations include

- Green Paper on Sustainable Energy: Department of Communications, Marine and Natural Resources (1999)([www.dcmnr.gov.ie](http://www.dcmnr.gov.ie))
- Irish Building Regulations (2002-2006): Department of Environment, Heritage and Local Government ([www.environ.ie](http://www.environ.ie)).
  - Part L Conservation of Fuel and Energy,
  - Part F Heating Producing Appliances,
  - Part J Ventilation.
- National Spatial Strategy (2002): Department of Environment, Heritage and Local Government ([www.irishspatialstrategy.ie](http://www.irishspatialstrategy.ie) )

Examples of actions that have been taken at a National level include: -

- Full market access for renewables and CHP to the grid
- Increase in afforestation grants to increase levels of forestry
- Establishment of Sustainable Energy Ireland as a Statutory body
- Establishment of Commission for Energy Regulation and liberalisation of electricity and gas markets
- Improved building regulations for residential and non-residential sector
- Draft Action Plan for Energy Performance of Buildings Directive proposed
- Renewable Energy Fix Feed in Tarriff Scheme announced.
- Appointment of Environment Protection Agency (EPA) as coordinator of National Carbon Emissions Allocation Plan.

## 2.4 Local Government

The Local Authorities in the study area are: -

- Clare County Council
- Limerick County Council
- Limerick City Council

The local authorities are required to take account of the relevant European and National legislation when framing their development plans. Sustainable Development, support for renewable energy and other aspects are all integrated into the relevant Development Plans in the study area.

In addition, the relevant City and County Development Boards provide a mechanism to complete additional analysis and provide support for further actions in areas relevant to sustainable energy. The Mid West Regional Authority, through the implementation of the Regional Planning Guidelines is also supporting the sector.





## 3.0 Energy Emissions Financial Implications

### 3.1 Carbon Levies - National

The Limerick Clare Energy and Emissions Balance highlighted that Ireland is behind in terms of meeting its commitments under the Kyoto Protocol. Table 3.1 illustrates this fact highlighting that, for energy related emissions alone Ireland is currently (2005) 9,125 kilo tonnes above its Kyoto Target, and could be in the region of 17,000 kilo tonnes above by 2010.

The Environmental Protection Agency (EPA) have indicated that Irish consumers and businesses produced 68.46 million tonnes of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases in 2004, an increase of just less than 1 per cent on 2003. This is 23 per cent higher than the levels Ireland was producing in 1990. Under the Kyoto Protocol, Ireland is committed to keeping its emissions at 13 per cent above 1990 levels, or a cap of just over 63 million tonnes. Energy accounted for just over 23 per cent of emissions and transport at 18.4 per cent. The increase of greenhouse gases since 1990 has been driven to a large extent by the transport sector. Emission levels have more than doubled from 5.66 million tonnes a year to 12.1 million tonnes in 2004.

**Table 3.1: Ireland Financial Costs from Energy Related CO<sub>2</sub> Emissions**

*Source SEI (2006), ICF BOC (2005)*

Energy Related Emissions	Total Emissions (‘000 T CO <sub>2</sub> )	Projected Difference to Target (‘000 T CO <sub>2</sub> )	Projected Cost of CO <sub>2</sub> /ton Trading Price (€)	Annual CO <sub>2</sub> Costs (Million €)
1990 Levels	30,649	-	-	-
Kyoto Targets +13%	34,633	-	-	-
2004	43,174	8,541	15	€ 128
2005 Estimate	43,758	9,125	27	€ 246
2010 BAU <sup>1</sup>	51,451	16,818	35	€ 589

### 3.1 Carbon Levies – Study Region

Estimating the cost to the Ireland and within the study area of exceeding the Kyoto requirements is somewhat difficult to achieve given the lack of clarity with regard to the price of carbon as a traded commodity and also with regard to potential levels of fines under the Kyoto Protocol. However, using the current price of Carbon as traded under the EU Emissions Trading scheme provides some basis for analysis. In March 2006 the price for Carbon Credits was approximately €27 per tonne. An EPA commissioned report indicated that this could drop to €15 per tonne, while financial analysts have indicated that it could rise to €50 per tonne (ICF, 2005). The approach taken for this study and the Limerick Clare Energy & Emissions Balance has been to use the current price of €27 per tonne<sup>2</sup> for the 2005 estimate and to assume a value of €35 per tonne for the 2010 scenario. Based on this the Energy and Emissions Balance reported the financial implications or Carbon Levies within the study area. These are shown in Table 3.2.

<sup>1</sup> BAU – Business and Usual



**Table 3.2: Emissions and Potential Carbon Levies within Study Area**

	Clare County			Limerick County			Limerick City		
	Emissions (‘000 T- CO <sub>2</sub> )	Kyoto Target Exceedance (‘000 T-CO <sub>2</sub> )	Annual Carbon Levy (€millions)	Emissions (‘000 T- CO <sub>2</sub> )	Kyoto Target Exceedance (‘000 T-CO <sub>2</sub> )	Annual Carbon Levy (€millions)	Emissions (‘000 T- CO <sub>2</sub> )	Kyoto Target Exceedance (‘000 T-CO <sub>2</sub> )	Annual Carbon Levy (€millions)
<b>1990</b>	828.3	0	0	989	0	0	418.6	0	0
<b>Kyoto Target (1990 + 13%)</b>	936.0	0	0	1,117.6	0	0	473.0	0	0
<b>1995</b>	914.0	0	0	1,094.3	0	0	466.8	0	0
<b>2000</b>	1,172.8	236.8	0	1,374.8	257.2	0	541.9	68.9	0
<b>2002</b>	1,222.5	286.5	0	1,437.6	320.0	0	537.3	64.3	0
<b>2004</b>	1,206.9	270.9	0	1,421.8	304.2	0	531.2	58.2	0
<b>2005 est</b>	1,235.3	299.3	8	1,456.1	338.5	9.1	543.4	70.4	1.9
<b>BAU 2010</b>	1,425.6	489.6	17.1	1,680.5	562.8	19.7	623.8	150.8	5.3
<b>BAU2015</b>	1,531.5	595.5	26.8	1,805.9	688.3	31.0	667.0	194.0	8.7

