



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN LIMERICK CITY



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

LIMERICK CITY

CONTENTS

INTRODUCTION & OVERVIEW	5
1. Introduction & Overview	6
1.1 The Need for an Energy & Low Carbon Strategy	7
1.2 The Low Carbon Society & Economy	7
1.3 Definitions	7
STRATEGIC VISION & FRAMEWORK	9
2. Strategic Vision & Framework	10
2.1 Limerick City Development Plan, 2010 - 2016	10
2.2 Community, Conservation & Commerce	12
2.3 Integrated Approach	12
POLICY CONTEXT	13
3. Policy Context; Global, European, National, Regional & Local	14
3.1 Global Policy Context	14
3.2 European Union Context	15
3.3 National Policy Context	18
3.3.2 White Paper on Energy, 2014	18
3.4 Regional Policy Context	20
3.5 Local Policy Context	20
PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE	21
4. Profile of Limerick City	22
4.1 Limerick City Energy Analysis by Fuel & Sector	23
4.2 Limerick City – Principal Energy Data; Evolution 1990 – 2020	25
4.3 Limerick City – Principal Energy Emissions Data; 1990 - 2020	26
4.4 National Energy Efficiency Action Plan 2 - Savings sought Limerick City - Burden Sharing	28
SUSTAINABLE ENERGY & CLIMATE ACTION PLAN	31
GLOSSARY	40

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SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

INTRODUCTION & OVERVIEW	4
1. Introduction & Overview	5
1.1 The Need for an Energy & Low Carbon Strategy	6
1.2 The Low Carbon Society & Economy	6
1.3 Definitions	6

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

1. INTRODUCTION & OVERVIEW

Limerick City and County is the first of the amalgamated local authorities under the Local Government Reform Act of 2014. Limerick City and County were officially amalgamated with the local elections of June 2014, creating a unified political and executive structure to administer the social and economic needs of Limerick City and County.

Limerick has a long tradition of meeting the country's strategic energy needs. The cornerstone of Rural Electrification was established at Ardnacrusha on the river Shannon that flows through Limerick City. The 89 Mega Watt hydro power plant at Ardnacrusha has been providing power to Ireland's electricity grid since 1929.

Today Limerick has expanded its portfolio of over 250 MW of renewable energy generation capability to include:-

- Wind:
- Anaerobic Digestions
- Landfill Gas to Energy
- Biomass district heating
- Electric Heat Pump District Heating
- Tidal & Wave energy

Limerick City and County is now positioned to make the logical transition to a Low Carbon Society and Economy.

Vital elements of the county's position on low carbon energy are:-

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

This document sets out to establish a framework within which strategic national and local targets on energy & energy related carbon emissions can be addressed in a Sustainable Energy Action & Climate Plan. The objectives of the plan are in two main Topics of Energy Efficiency & Conservation and Energy Security & Supply. Under these main topics we have identified five themes that relate directly to the National Energy Efficiency Action Plans. Utilising the themes used in the national documents and analysis enable us to identify how we may participate fully in the local burden sharing of a national target. The topics and themes are set out in the table below.

TOPICS	#	THEMES
Energy Efficiency & Conservation	1.	Public Sector
	2.	Business & Commercial
	3.	Buildings
	4.	Mobility & Transport
Energy Security & Supply	5.	Energy Generation, Distribution & Storage

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

1. INTRODUCTION & OVERVIEW *(continued)*

1.1 The need for an Energy & Low Carbon Strategy

The City & County Development Strategies are being reviewed as part of the cycle of development plans that expire in 2017.

Limerick City & County have come through a period of considerable social, economic and environmental change. One example of this change has been the environmental and socio-economic costs of extreme weather events associated with climate change, following the flooding in the winters of 2009 to 2014.

Economically Limerick is beginning to recover from the global recession and is putting in place an economic master plan "Limerick 2030" which seeks to establish Limerick place at the heart of an economic counter balance to the economic strength of the east coast. The €250 million euro plan entitled 'Limerick 2030 – An Economic and Spatial Plan for has the potential to deliver 5,000 new jobs and sets out a number of objectives which will considerably change the infrastructure of the city centre and deliver a whole new vision for Limerick as a leading centre for commercial investment

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. All developed countries, including those with large reserves of fossil fuels, are concerned with their economic development being so dependent 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 still being formalised. What is clear is that we must meet the needs of our citizens and enable the creation of wealth from energy efficient systems based on indigenous renewable energy.

END OF SECTION

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

STRATEGIC VISION & FRAMEWORK	9
2. Strategic Vision & Framework	10
2.1 Limerick City Development Plan, 2010 - 2016	10
2.2 Community, Conservation & Commerce	12
2.3 Integrated Approach	12

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

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, most notably the United National Framework

2.1 Limerick City Development Plan, 2010 - 2016

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

LIMERICK CITY DEVELOPMENT PLAN OBJECTIVES, OVERALL VISION:

Policy EDS.1

It is the policy of Limerick City Council to co-operate with all agencies in the region to facilitate the implementation of the economic and investment strategy, in co-operation with other institutions and the private sector, placing particular emphasis on seeking to secure the economic development of the City.

LIMERICK CITY DEVELOPMENT PLAN OBJECTIVES, SUSTAINABILITY & RENEWAL:

Policy EDS.9

It is the policy of Limerick City Council to prepare plans for urban renewal and sustainable development for areas in need of renewal and regeneration especially urban renewal of the City Centre and to pursue the implementation of that plan with the utmost vigour.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, ENERGY INFRASTRUCTURE:

Policy EDS.10

It is the policy of Limerick City Council to support the development of a high quality energy and broadband network for the city and the region.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, TRANSPORT VEHICLES:

Policy TR.25 Promotion of Alternative Energy Sources for Vehicles

It is the policy of Limerick City Council to promote and to encourage the supply of facilities for the supply of energy to vehicles from proven alternatives to fossil fuels. In this respect this may involve the provision of on street charging points for electric vehicles or facilities for the discharge of Bio-Fuels.

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

2. STRATEGIC VISION & FRAMEWORK *(continued)*

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, RENEWABLE ENERGY:

Policy EM.14

It is the policy of Limerick City Council to support the development and use of renewable energy within the City.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, CLIMATE CHANGE:

Policy EM.15

It is the policy of Limerick City Council to adopt and implement the policy framework as set out in the Climate Change Strategy within the lifetime of this Development Plan.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, LOW ENERGY BUILDINGS:

Policy EM.16

It is the policy of Limerick City Council to encourage the use of energy saving measures and sustainable/renewable energy technologies in new developments where appropriate. Limerick City Council will promote and encourage the development of 'low energy buildings' as standard throughout the City.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, ENERGY EFFICIENT DESIGN:

Policy EM.17

It is the policy of Limerick City Council to encourage energy efficiency through the design of buildings, layout and orientation on site.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, PUBLIC AWARENESS:

Policy EM.18

It is the policy of Limerick City Council in partnership with other relevant agencies to increase public awareness of energy best practice.

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

2. STRATEGIC VISION & FRAMEWORK *(continued)*

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, MUNICIPAL BUILDINGS:

Policy EM.19

It is the policy of Limerick City Council to seek to improve the energy efficiency of its existing building stock.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, BUILDING SUSTAINABILITY:

Policy EM.20

It is the policy of Limerick City Council to prepare a sustainability checklist outlining best practice in achieving energy efficiency and sustainability in design and construction during the lifetime of the Development Plan and to incorporate these into the development management system.

LIMERICK COUNTY DEVELOPMENT PLAN OBJECTIVES, RESEARCH & DEVELOPMENT :

Policy EM.21

It is the policy of Limerick City Council to pursue initiatives which promote innovation in the fields of energy conservation and renewable energy resources and research.

The direction & development of all economic and social activity flows from the objectives stated above. These objectives identify Limerick City's role in the provision of a Clean – Green Economy, that serves the social needs of its citizens.. The ultimate aim is to enable entrepreneurs to generate wealth from secure and sustainable, low carbon indigenous energy

2.2 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 local authorities 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 at all levels of conurbation, town, city, county and country.

2.3 Integrated Approach

The measures identified seek to address the energy related climate change issues that are 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.

END OF SECTION

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

	POLICY CONTEXT	13
3. Policy Context; Global, European, National, Regional & Local		14
3.1 Global Policy Context		14
3.2 European Union Context		15
3.3 National Policy Context		18
3.3.2 White Paper on Energy, 2014		18
3.4 Regional Policy Context		20
3.5 Local Policy Context		20

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL

3.1 Global Policy Context

Climate Change has become one of 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 greenhouse 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 (UNFCCC) and the Conference of Parties (parties to the Kyoto Protocol).

Table 3.1 Timetable of Global Action on Climate Change

YEAR	EVENT	PROTOCOL MILESTONE
2015	COP 21; CMP11. Paris	Limitation of increase in global average surface temperature to 2 °C.
	COP18; CMP8. Dohar, Qatar	Kyoto Period extension proposed to 2020
2010	COP 16; CMP 6. Cancun, Mexico	29 th November to 10 th 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	COP 3 (Kyoto, Japan)	Kyoto Protocol Adopted
1995	COP1 (Berlin)	Berlin Mandate on Conference of Parties
1992	Rio De Janeiro, Brazil.	"Rio Earth Summit". Declaration on Environment & Development. Local Agenda 21
1990	Edinburgh, Scotland New York, USA	IPCC and second WCC call for global treaty on climate change. September, United Nations General Assembly negotiations on a framework convention
1988	New York, USA	I.P.C.C. Established by World Meteorological Organisation and UN.
1979	Geneva, Switzerland.	First World Climate Conference (WCC)
1972	Stockholm, Sweden.	Conference on Human Environment

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL

(continued)

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 CO₂ 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 recent key Directives and Polices related to energy and climate change 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-ECI-National Renewable Energy Templates
- COM (2005) 628 final: Biomass Action Plan

3.3 National Policy Context

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

- National Renewable Energy Action Plan, 2012
- Offshore Renewable Energy Development Plan, 2014
- National Energy Efficiency Action Plan, 2014
- White Paper on Energy, 2015.
- Climate Action & Low Carbon Change Act, 2015

3.3.1 National Climate Change Strategy, 2014

This document sets out Ireland's target greenhouse gas reductions. The following **Table 3.2** summarises 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

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL

(Continued)

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

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL (Continued)

The reductions by sector are summarised below: (Continued)

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

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

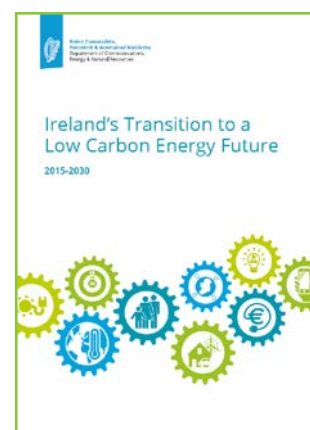
3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL

(Continued)

3.3.2 White Paper on Energy, 2014

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.
- 33% of electricity from renewables by 2020. (increased to 40% 2008)
- 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).

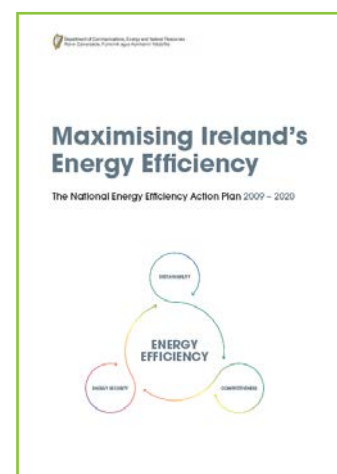


3.3.3 National Energy Efficiency Action Plan,

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.



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL (Continued)

Table 3.3 Irelands Energy Efficiency Action Plan Target reductions

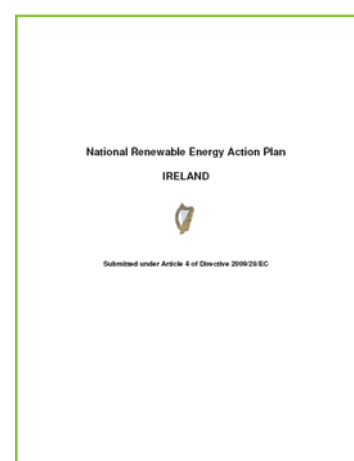
Sector	NEEAP target ²	NEEAP CO ₂ ²	NEEAP target ²
	20% - 2020	Reduction 2020	Sector %
	GWh ³	kt-CO ₂	%
Public Sector	3,400	856	9.7%
Business	6,480	1,661	18.6%
Residential Sector	18,370	4,928	52.7%
Transport Sector	5,450	1,473	15.6%
Electricity Supply Sector	1,185	595	3.4%
Thermal Supply Sector	-	-	0.0%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

3.3.4 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.



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

3. POLICY CONTEXT; GLOBAL, EUROPEAN, NATIONAL, REGIONAL & LOCAL

(Continued)

3.4 Regional Policy Context

Limerick City 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 Limerick City & Council in their respective Development Plans, as outlined in Section 2.1 above. However the cities energy consumption and its associated climate change implications will be significantly dependent upon the actions of very large energy users and carbon emitters such as Money point power generation station, Shannon Airport, Irish Cement, etc. as well as the accumulated effects of the industrial, commercial, agricultural, residential and transport energy consumers.

3.5.1 Local Economic & Community Plans

“The purpose of the Local Economic Community Plan (*LECP*)¹, as provided for in the Local Government Reform Act 2014, is to set out for a six-year period, the objectives and actions needed to promote and support the economic development and the local and community development of the relevant local authority area, both by itself directly and in partnership with other economic and community development stakeholders”.

The LCEA proposes that the high level goals in the LECP should reflect the Objectives in the City & County Development Plans to establish a Low Carbon Society and Economy in Limerick City. The LCEA has worked with economic and community groups to identify appropriate objectives and actions that will support Limerick's transition to a Low Carbon future.

END OF SECTION

¹ DCENR, “Guidelines on Local Economic & Community Plans”, 2015

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE	21
4. Profile of Limerick City	22
4.1 Limerick City Energy Analysis by Fuel & Sector	23
4.2 Limerick City – Principal Energy Data; Evolution 1990 – 2020	25
4.3 Limerick City – Principal Energy Emissions Data; 1990 - 2020	26
4.4 National Energy Efficiency Action Plan 2 - Savings sought Limerick City - Burden Sharing	28

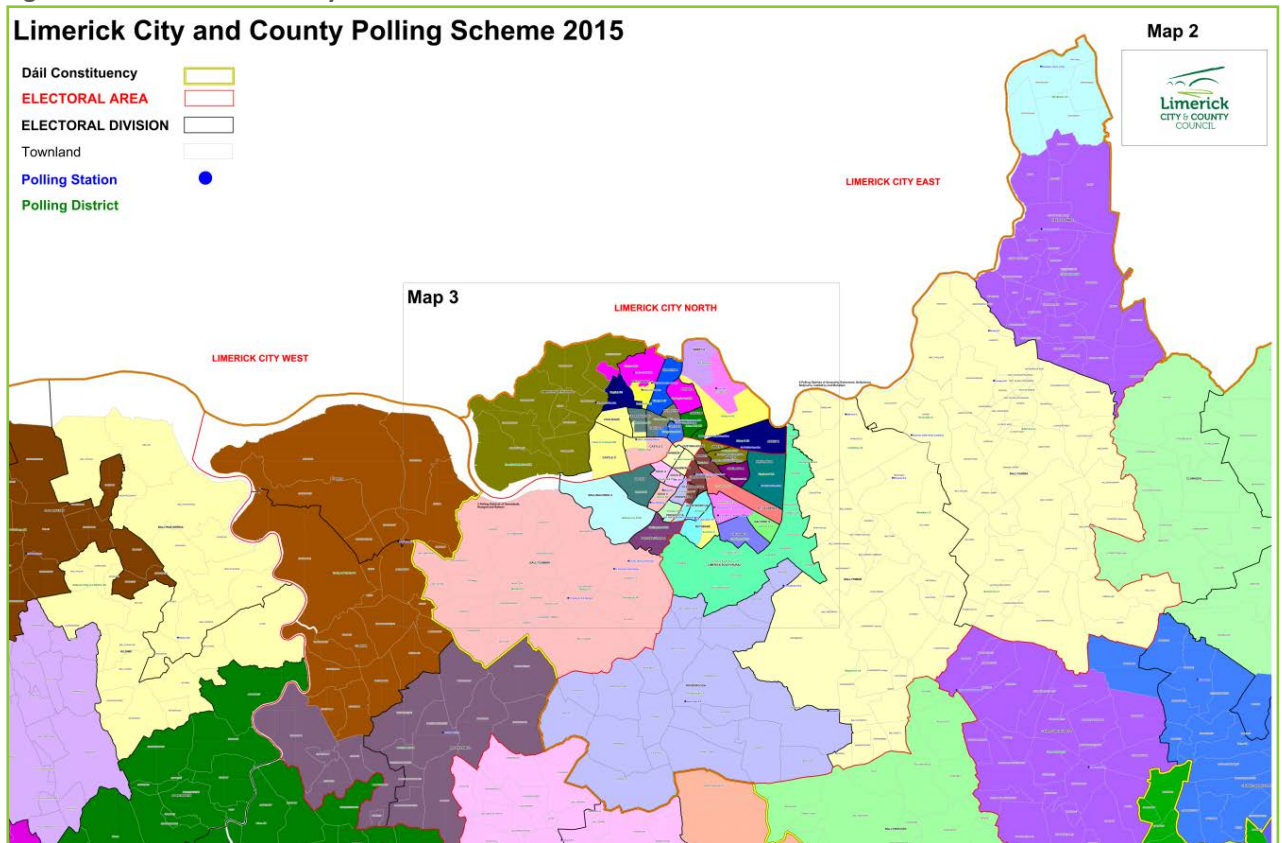
SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE

4. Profile of Limerick City

Limerick City is situated on the west coast of Ireland in the province of Munster, covering an area of some 2,086 hectares.

Figure 4.1 Limerick City Political



The city’s population has been relatively consistent in relation to the national at 2.5%, and is presently approximately 58,500 people. The population figures for the city reflect the economic and social change that has occurred over the years.

Table 4.1 Limerick City Population

LIMERICK CITY POPULATION ANALYSIS						
Year	1971	1981	1991	2002	2006	2011
Population	57,161	60,736	52,083	54,023	52,539	57,106
% - Previous		6.3%	-14.2%	3.7%	-2.7%	8.7%
% - National	3.9%	3.5%	2.9%	2.7%	2.5%	2.5%

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

4.1 Limerick City Energy Analysis by Fuel & Sector

The following tables set out the energy requirements for County Clare analysed by fuel type and economic sector. The tables also show the predicted energy demands in 2020 under a Business As Usual (Baseline) or with energy efficiency and renewable energy measures achieved (NEEAP/NREAP)

Table 4.2 Limerick City Energy Consumption - 1990 - 2020 by Fuel

Fuel	1990	2010	2020 Baseline	2020 NEEAP/NREAP
Electricity	187.2	323.6	322.8	314.2
Natural Gas	112.8	253.2	277.3	220.8
Oil	646.5	1,002.1	1,106.2	937.1
Coal	156.4	57.7	30.5	28.9
Peat	134.1	37.1	20.3	18.7
Renewables	21.2	57.2	55.2	139.1
Grand Total	1,258.2	1,731.0	1,812.2	1,658.8

Table 4.3 Limerick City Energy Consumption – 1990 - 2020 by Sector

Sector	1990	2010	2020 Baseline	2020 NEEAP/NREAP
Agriculture	0.0	0.0	0.0	0.0
Commercial	180.4	205.7	153.0	124.0
Industry	361.4	436.8	481.5	474.4
Residential	399.9	477.1	463.0	370.4
Transport	316.5	611.5	714.7	690.0
Grand Total	1,258.2	1,731.0	1,812.2	1,658.8

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

Figure 4.2 Energy by Fuel

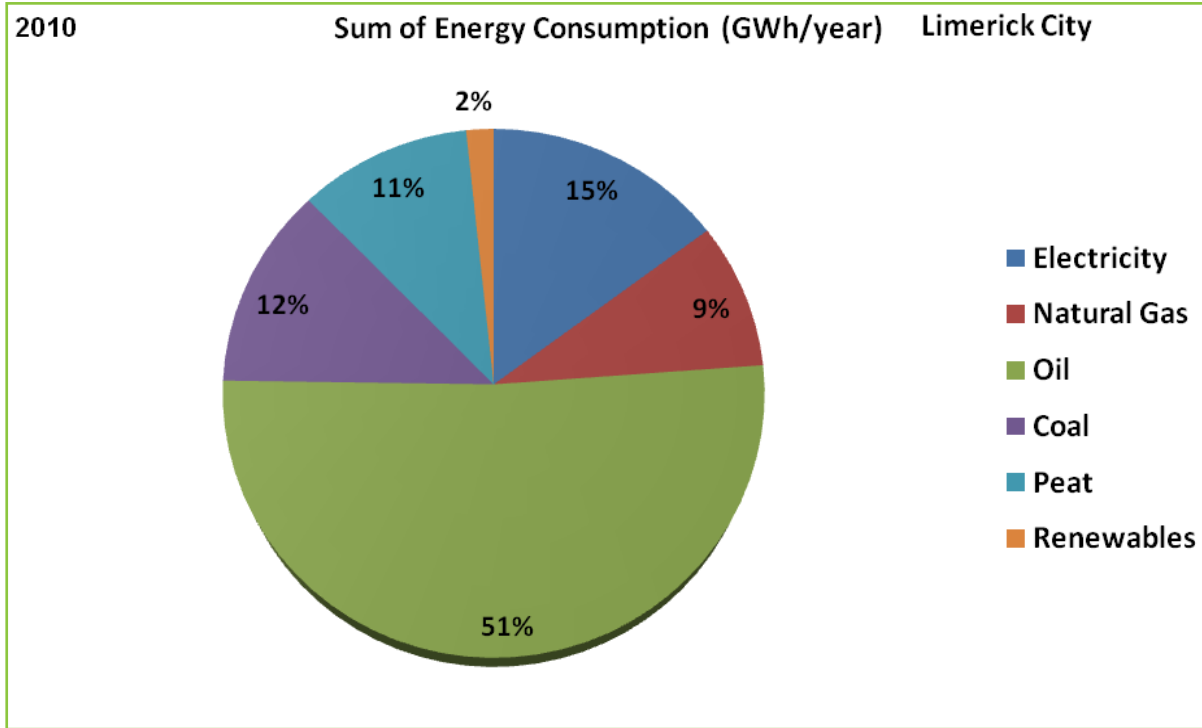
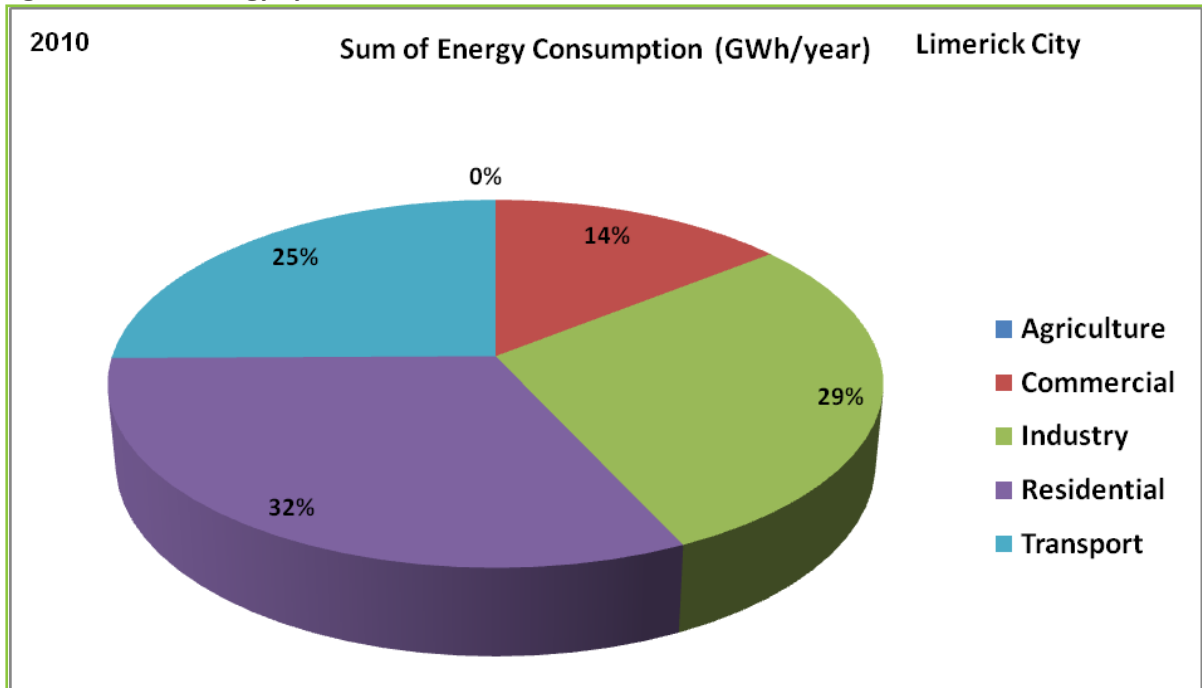


Figure 4.3 Energy by Sector



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

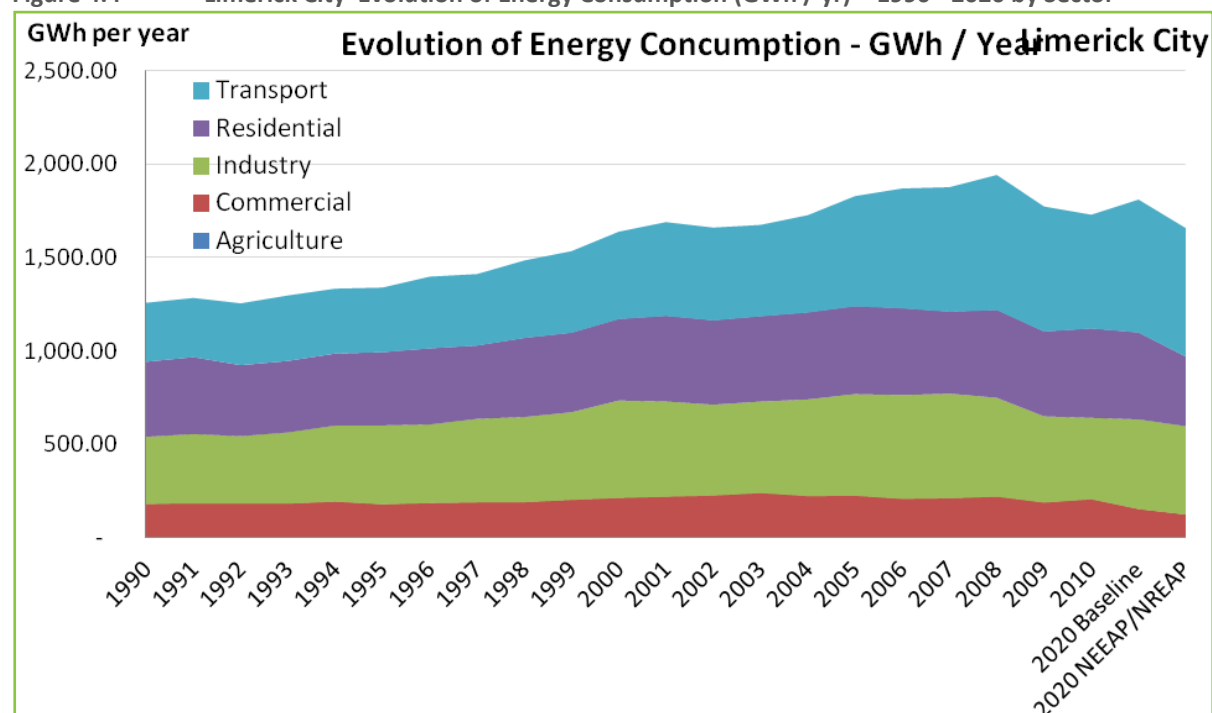
4.2 Limerick City – Principal Energy Data; Evolution 1990 - 2020

The following table and chart illustrates the evolution of energy consumption in Limerick City from 1990 to date.

Table 4.4 Limerick City Evolution of Energy Consumption (GWh / yr) – 1990 - 2020 by Sector

Years	Agriculture	Commercial	Industry	Residential	Transport	Grand Total
1990	-	180.38	361.36	399.94	316.55	1,258.23
1995	-	178.72	423.52	390.08	347.43	1,339.75
2000	-	212.50	522.62	434.83	469.98	1,639.93
2005	-	224.49	544.72	469.07	592.29	1,830.57
2010	-	205.66	436.81	477.05	611.48	1,731.00
2020 Baseline	-	152.97	481.51	463.04	714.71	1,812.24
2020 NEEAP /NREAP	-	123.96	474.41	370.38	690.04	1,658.78

Figure 4.4 Limerick City Evolution of Energy Consumption (GWh / yr) – 1990 - 2020 by Sector



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

4.3 Limerick City – Principal Energy Emissions Data; 1990 - 2020

The following table and chart illustrate the evolution of energy related CO₂ emissions by sector from 1990 to 2020. The figures for 2020 are shown as:-

- 2020 Baseline = Emissions associated with a “business as usual” scenario
- 2020 NEEAP = Emissions associated with a the achievement of energy efficiency and renewable energy targets

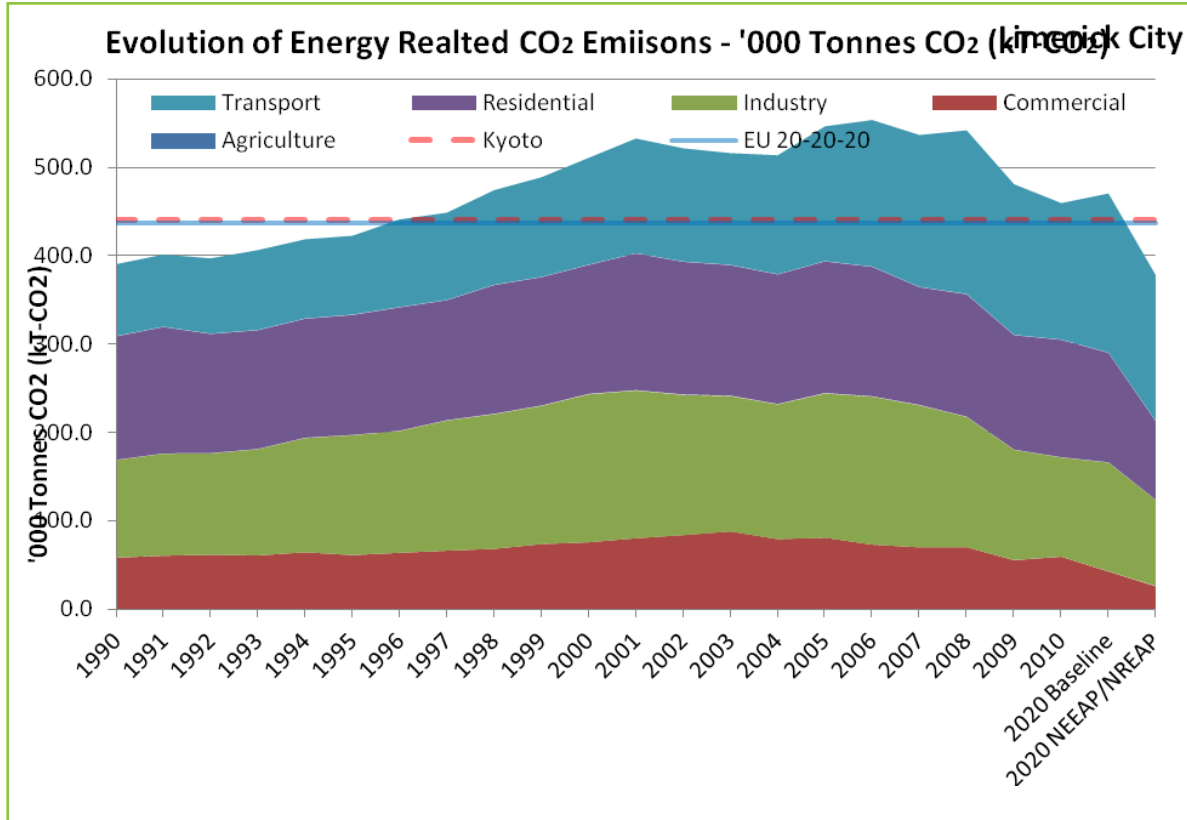
Table 4.5 Limerick City Evolution of Energy Emissions (,000T / CO₂) – 1990-2020 by Sector

Evolution of Energy - CO ₂ Emissions (KT-CO ₂) 1990 - 2020						
Year	Agriculture	Commercial	Industry	Residential	Transport	Grand Total
1990	0.0	57.8	110.9	140.0	81.4	390.1
1995	0.0	60.6	136.3	136.0	89.4	422.3
2000	0.0	75.2	168.4	146.0	121.1	510.7
2005	0.0	80.3	164.1	149.2	152.7	546.3
2010	0.0	58.8	112.8	133.1	154.7	459.4
2020 Baseline	0.0	42.1	123.8	124.1	180.3	470.3
2020 NEEAP/NREAP	0.0	25.5	97.9	89.0	165.3	377.6

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

Figure 4.4 Limerick City Evolution of Energy Emissions (,000T / CO₂) – 2010-2020 by Sector



SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

4.4 National Energy Efficiency Action Plan 2 – Savings sought Limerick City - Burden Sharing

The following table sets out the. The amounts are apportioned from the National figures based on proportion of energy consumed.

Table 4.6 Savings for energy and energy related CO₂ emissions for Limerick City

NEEAP 3	Energy savings (GWh PEE)			%	CO2 savings (kt)		
	2010	2016	2020		2010	2016	2020
Public Sector	48.6			10%			
Public Sector Programme	1.1	9.7	18.8		0.26	2.24	4.22
Green Public Procurement (via ACA)	0.4	2.3	4.3		0.08	0.50	0.89
SEEEP and EERF (public sector)	1.4	1.4	1.4		0.32	0.30	0.30
Public Sector Building Demonstration Programme	2.1	2.1	2.1		0.50	0.48	0.47
CHP (public sector)	1.8	2.4	2.8		0.44	0.57	0.68
ReHeat (public sector)	1.7	1.9	1.9		0.39	0.45	0.45
Public transport efficiency	1.4	2.4	2.4		0.35	0.60	0.60
Better Energy (public sector)	-	7.5	15.0		-	1.71	3.35
Business	87.3			17%			
SEAI Large Industry Programmes	23.9	33.5	41.0		5.97	8.09	9.63
SEAI SME Programme	2.3	6.0	7.6		0.54	1.37	1.70
ACA (private sector)	0.8	5.6	10.4		0.20	1.20	2.10
SEEEP and EERF (private sector)	2.6	2.6	2.6		0.63	0.62	0.60
CHP (private sector)	4.2	5.6	6.5		1.02	1.35	1.56
ReHeat (private sector)	3.8	4.4	4.4		0.92	1.05	1.05
Better Energy (Commercial sector)	-	7.5	15.0		-	1.71	3.35

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

4.4 National Energy Efficiency Action Plan 2 – Savings sought Limerick city - Burden sharing

Table 4.6 Savings for energy and energy related CO₂ emissions for Limerick City *(Continued)*

NEEAP 3	Energy savings (GWh PEE)			%	CO2 savings (kt)		
	2010	2016	2020		2010	2016	2020
Buildings	228.8			45%			
2002 Building Regulations -Dwellings	19.2	19.2	19.2		4.68	4.68	4.68
2008 Building Regulations -Dwellings	1.3	18.2	31.7		0.32	4.43	7.71
2011 Building Regulations -Dwellings	-	5.7	12.5		-	1.40	3.05
Building Regulations - Nearly Zero Energy Dwellings	-	0.2	3.4		-	0.05	0.83
2005 Building Regulations - Buildings other than dwellings	2.8	4.5	4.5		0.68	1.08	1.07
2012 Building Regulations - Buildings other than dwellings	-	5.9	13.0		-	1.40	3.08
Energy efficient boiler regulation	3.0	12.0	18.0		0.74	2.93	4.40
Domestic Lighting (Eco-Design Directive)	3.0	18.0	18.0		0.71	3.89	3.63
Greener Homes Scheme (GHS)	1.8	1.8	1.8		0.42	0.42	0.42
Warmer Homes Scheme (WHS)	1.9	2.0	2.0		0.50	0.50	0.50
Home Energy Saving (HES) scheme	5.5	5.5	5.5		1.35	1.35	1.35
Smart Meter roll-out	-	5.6	9.4		-	1.20	1.89
Better Energy Homes (residential retrofit)	-	45.0	90.0		-	11.10	22.14

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

4. PROFILE OF LIMERICK CITY ENERGY & CLIMATE CHANGE *(Continued)*

4.4 National Energy Efficiency Action Plan 2 – Savings sought Limerick City - Burden Sharing *(Continued)*

NEEAP 3	Energy savings (GWh PEE)			%	CO2 savings (kt)		
	2010	2016	2020		2010	2016	2020
Mobility-Transport	80.0			16%			
Electric vehicle deployment	-	4.0	10.4		-	1.02	2.63
Vehicle registration tax (VRT) and annual motor tax (AMT) rebalancing	2.8	12.4	9.8		0.71	3.17	2.52
Improved fuel economy of private car fleet (EU Regulation)	2.9	23.6	45.2		0.72	6.03	11.54
More efficient road traffic movements	-	5.6	10.7		-	1.44	2.73
Aviation efficiency	3.8	3.8	3.8		0.98	0.98	0.98
Energy Supply	66.2			13%			
Electricity generation efficiency improvements	25.4	25.1	60.8		6.33	4.40	7.86
Transmission and distribution savings	4.1	4.9	5.4		0.99	1.07	1.10

4.5 National Energy Efficiency Action Plan 2 – Savings sought Limerick City - Burden Sharing *(Continued)*

NEEAP 3	Energy savings (GWh PEE)			%	CO2 savings (kt)		
	2010	2016	2020		2010	2016	2020
Totals	24.7	17.6	510.9	100%	30.69	74.70	114.98

END OF SECTION

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

5. SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

The Limerick City Sustainable Energy Action Plan was established in 2016 under the existing County Development Plan. The Steering Committee of the SEAP comprised of stakeholders from various areas including business, community, energy, local authority and transport.

The steering committee identified five key themes and actions that would enable the development of a low carbon community and commerce in Limerick City.

The actions of the plan are in 5 – main themes, devised from two core principles in the City Development Plan 2010 - 2016.

Topics	#	Themes
Energy Efficiency & Conservation	1.	Public Sector
	2.	Business & Commercial
	3.	Buildings
	4.	Mobility & Transport
Energy Security & Supply	5.	Energy Generation, Distribution & Storage

The actions associated with the five themes are outlined below. Many / most of the actions will require the cooperation of a number of key stakeholders and community leaders. Where a lead stakeholder can be identified the Action Leader is identified in bold.

External funding / incentives or grants may also be an essential part of delivering many of the actions identified.

THEME 1: ENERGY EFFICIENCY & CONSERVATION - PUBLIC SECTOR

No.	Action	Company / Organisation / Individual	Start	End	Saving - MWh/yr	RE MWh / Year	Save CO ₂ T/yr
1	Establish Energy Management System - ISO 50001 in Local Authority	Limerick City & County Council / LCEA	Jan-16	Sep-17	15.9	-	5.0
2	Public Lighting upgrades	Limerick City & County Council / SEAI / TII/ LCEA	Jan-14	Dec-20	784.6	-	366.8
3	Water & Waste Water Services upgrade - Local Authority	Limerick City & County Council / LCEA	Jan-14	Dec-20	3.6	-	1.7
4	Water & Waste Water Services upgrade - Irish Water	Irish Water	Jan-14	Dec-20	290.7	-	118.9
5	Public Awareness / Behaviour Change Programmes	Limerick City & County Council / LCEA / RWMO	Jan-14	Dec-20	2.5		1.2
6	Better Energy Communities Programmes	Limerick City & County Council / LCEA / SEAI	Jan-14	Dec-20	9,000.0		2,007.0
7	Health Care - Efficiency Measures	HSE / SEAI	Jan-15	Dec-20	8,471.3		1,770.3
8	Justice & Prisons - Facilities	Dept. Justice / SEAI	Jan-14	Dec-20	3,765.0		843.0
	NEEAP / NREAP		Jan-14	Dec-20	26,266.5		5,821.1
	TOTALS				48,600.0		10,935.0

THEME 2: ENERGY EFFICIENCY & CONSERVATION - BUSINESS & COMMERCIAL

No.	Action	Company / Organisation / Individual	Start	End	Saving - MWh/yr	RE MWh / Year	Save CO ₂ T/yr
1	Development of Local / Regional Resource Mgt. Programmes	Limerick City & County Council / LDC / RWMO	Jan-16	Dec-20	2,250.00		401.40
2	EPA energy efficiency Programmes	EPA / Limerick City & County Council / RWMO	Jan-14	Dec-20	4,950.0		1,103.9
3	SEAI - Better Energy Communities Co-Ops Support	Limerick City & County Council / LDC / SEAI	Jan-14	Dec-20	1,500.0		234.2
4	Combined Heat & Power in Leisure Centres	Limerick City & County Council / LDC / SEAI	Jan-15	Dec-20	3,870.0		936.0
5	Establish Low Carbon centre based on 100% renewables	Limerick Enterprise Office / LDC / SEAI	Jan-17	Dec-20	750.0	750.0	167.3
6	Establish Smart Grid - IT solutions	ESB / Limerick City & County Council / LDC	Jan-17	Dec-20	600.0	600.0	110.4
7	Establish Community Energy Cooperatives for Pro-Sumers	Limerick Enterprise Office / LCEA/ LDC / ESB / LEO	Jan-17	Dec-20	900.0	900.0	220.8
8	SEAI / LEO / RWMO; SME supports	RWMO/ Limerick City & County Council / LCEA/ LDC / / LEO	Jan-14	Dec-20	5,302.5		1,186.5
9	Large Industry Peer led programmes	SEAI / Limerick City & County Council / LCEA	Jan-14	Dec-20	22,522.5		5,296.5
	NEEAP / NREAP other measures		Jan-14	Dec-20	44,655.0		10,323.2
	TOTALS				87,300.0	2,250.0	19,980.0

THEME 3: ENERGY EFFICIENCY & CONSERVATION – BUILDINGS

No.	Action	Company / Organisation / Individual	Start	End	Saving - MWh/yr	RE MWh / Year	Save CO2 T/yr
1	Upgrade to new Corporate Head Quarters - Merchants Quay	Limerick City & County Council / LCEA /	Jan-17	Dec-19	324.4	300.0	107.6
2	Refurbishment of Opera Quarter Buildings	Limerick City & County Council / LCEA /	Jan-17	Dec-19	454.1	150.0	199.9
3	Refurbishment of Granary Building	Limerick City & County Council / LCEA /	Jan-15	Dec-18	259.5	30.0	119.9
4	Re-Development of Hanging Gardens	Limerick City & County Council / LCEA /	Jan-17	Dec-19	194.6	60.0	116.9
5	Redevelopment of Georgian Quarter	Limerick City & County Council / LCEA /	Jan-17	Dec-20	428.2	450.0	181.4
6	Limerick Regeneration Projects	Limerick Regeneration / Limerick City & County Council	Jan-13	Dec-20	72,000.0	1,500.0	17,712.0
7	Warmer Homes Projects	SEAI / Limerick City & County Council / LDC	Jan-14	Dec-20	1,950.0		495.00
8	Residential buildings upgrades (private & Local authority)	Limerick City & County Council / LDC / LCEA / SEAI	Jan-14	Dec-20	4,489.5		1,107.0
9	Better Energy Communities - Community Buildings	Limerick City & County Council / LDC / LCEA / SEAI	Jan-14	Dec-20	36,000.0		8,856.0
10	Establish near zero energy dwellings & retail buildings zone	Limerick City & County Council / LDC / LCEA / SEAI	Jan-18	Dec-20	3,037.5		742.5
11	Integration of Renewable Thermal Technologies in Buildings	Limerick City & County Council / LDC / LCEA / SEAI	Jan-15	Dec-20	563.6	507.3	289.3
12	Integration of Renewable Electric Technologies in Buildings	Limerick City & County Council / LDC / LCEA / SEAI	Jan-17	Dec-20	313.1	187.9	107.1
	NEEAP / NREAP other measures				109,687.2		25,081.8
	TOTALS				229,701.8	3,185.1	55,116.4

THEME 4: ENERGY EFFICIENCY & CONSERVATION - MOBILITY & TRANSPORT

No.	Action	Company / Organisation / Individual	Start	End	Saving - MWh/yr	RE MWh / Year	Save CO2 T/yr
1	Attract car drivers towards more energy efficient transport	Limerick Smarter Travel / Limerick City & County Council	Jan-14	Dec-20	565.31		1,441.88
2	Pilot Electric Vehicle bus (public transport)	Limerick Smarter Travel / Limerick City & County Council	Jan-14	Dec-20	1,407.60	1,407.60	357.0
3	Promote & the use of Electric vehicles – private transport	Limerick Smarter Travel / Limerick City & County Council	Jan-18	Dec-20	3,757.05	3,757.05	952.9
4	Promote Alternative fuel (Hydrogen – bio fuel) vehicles – private transport	Limerick Smarter Travel / Limerick City & County Council	Jan-15	Dec-20	517.50	517.50	131.3
5	Audit of School transport systems & Walking Bus etc	Limerick Smarter Travel / Limerick City & County Council	Jan-15	Dec-20	1,492.43		380.7
6	Promote Park & Ride facilities	Limerick City & County Council / Limerick Smarter Travel	Jan-13	Dec-20	4,522.50		1,153.5
7	Promote & Develop Car Pooling & Car Sharing	Limerick Smarter Travel / Limerick City & County Council	Jan-17	Dec-20	2,713.50		692.1
8	Establish Smart Travel Cycle Lanes - City to University	Limerick Smarter Travel / Limerick City & County Council	Jan-14	Dec-19	31,657.50		8,074.5
9	Energy Efficiency Travel training for Local Authority employees	Limerick Smarter Travel / Limerick City & County Council	Jan-15	Dec-20	904.50		288.4
10	Public Travel Route planner 'one stop shop' call centre. IT resources needed	LDC / Bus Eireann / Limerick City & County Council / Limerick Smarter Travel	Jan-15	Dec-20	678.38		230.7
	NEEAP / NREAP other measures				31,733.7		6,682.2
	TOTALS				79,950.0	5,682.2	20,385.0

THEME 5: ENERGY SECURITY & SUPPLY - ENERGY GENERATION, DISTRIBUTION & STORAGE

No.	Action	Company / Organisation / Individual	Start	End	Saving - MWh/yr	RE MWh / Year	Save CO2 T/yr
1	Electricity transmission & distribution infrastructure capable of integrating Renewable Energy	Eirgrid / ESB Networks / Limerick City & County Council	Jan-12	Dec-20	3,564.0	3,564.0	722.7
2	Establish renewable electric generation & storage capacity to meet RE targets	Limerick City & County Council / Limerick Regen / LCEA / LDC	Jan-14	Dec-20	3,649.5	3,649.5	471.6
3	Promote / Establish District Heating. / CHP	Limerick City & County Council / Limerick Regen / LCEA / LDC	Jan-14	Dec-20	24,330.0	24,330.0	3,144.0
4	Promote / Establish carbon capture, storage & trading	University of Limerick / Limerick Institute of Technology / ESB	Jan-19	Dec-20	608.3		78.6
5	Establish the information technology infrastructure to support Smart Grid and the use of renewable technologies	University of Limerick / Limerick Institute of Technology / ESB	Jan-15	Dec-20	6,082.5		786.0
6	Establish a business incubator-cluster of energy commerce	University of Limerick / Limerick Institute of Technology / LEO	Jan-17	Dec-20	3,041.3	3,041.3	393.0
7	Establish Low Carbon Commercial Centre	University of Limerick / Limerick Institute of Technology / LEO	Jan-17	Dec-20	1,824.8	1,824.8	235.8
8	Establish Renewable Heat Energy Supply Chain, Production, Delivery, Testing, Harvesting, ESCO, etc.	University of Limerick / Limerick Institute of Technology / LEO	Jan-14	Dec-20	2,433.0	4,866.0	314.4
9	Establish Renewable Energy Training Centres at Third Level Institutes	University of Limerick / Limerick Institute of Technology / LEO	Jan-14	Dec-20	3,041.3	12,165.0	786.0
10	Smart Metering in Limerick City Buildings	ESB Networks / LIT / UL / Limerick City & County Council	Jan-14	Dec-20	1,781.3	5,343.8	94.5
	NEEAP / NREAP other measures				15,869.3		
	TOTALS				66,225.0	58,784.3	7,026.6

END OF SECTION

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

GLOSSARY

40

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
CER	Commission for Energy Regulation
Chambers	Chambers of Commerce group in county Clare
Clare Co Co	Clare County Council
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 Energy Valley	Promoters of Renewable Electricity Generation, Storage & distribution
Spirit of Ireland	Promoters of Renewable Electricity Generation, Storage & distribution
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

END