Comhairle Contae
Átha Cliath Theas
South Dublin County Council

leap leadership for energy action and planning

SOUTH DUBLIN SUSTAINABLE ENERGY ACTION PLAN

MAY 2013

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Appendices:

Covenant of Mayors
Committed to local sustainable energy

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ADHESION FORM

I, Caitriona Jones, **Mayor** of **South Dublin County** inform you that the **South Dublin County Council** decided at the meeting on **11th June 2012** to mandate **me** to sign up to the Covenant of Mayors, in full knowledge of all commitments, in particular:

- to **go beyond the objectives set by the EU for 2020**, reducing the CO_2 emissions in our respective territories by at least 20%;
- to **submit a Sustainable Energy Action Plan** including a baseline emission inventory which outlines how the objectives will be reached, within one year of the abovementioned date;
- to **submit an implementation report** at least every second year following the submission of the Action Plan for evaluation, monitoring and verification purposes;
- to **organise Energy Days**, in co-operation with the European Commission and with other stakeholders, allowing citizens to benefit directly from the opportunities and advantages offered by a more intelligent use of energy, and to regularly inform the local media on developments concerning the action plan;
- to **attend and contribute to the annual EU Conference of Mayors** for a Sustainable Energy Europe.

South Dublin County Council, County Hall, Tallaght, Dublin 24, Ireland
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11th June 2012,

Mayor Caitriona Jones

Prepared in association with :

codema Sustainable Dublin

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

FOREWORD

Since its establishment in 1994, South Dublin County Council has been committed to linking intensification of land use to transport systems and promoting easier access to employment, educational and amenity opportunities. This linking of environmental efficiency to fairness and social progress is underwritten by community engagement and open and accessible information systems.

In signing up to the Covenant of Mayors in June 2012, South Dublin County Council extends these efforts into the area of energy efficiency and reduction of greenhouse gas emissions, in partnership with sister authorities of similar mind, across the European Union. South Dublin County Council activities to date have centred on reducing the energy used in its own buildings and operations. The development of its first Sustainable Energy Action Plan (SEAP), commits the Council to act as a platform, promoting broader community and sectoral programmes of knowledge dissemination, training and physical projects, designed to reduce energy consumption, improve energy efficiency and reduce greenhouse gas emissions.

The motto of 'Record, Reduce and Replace' sets out a strategy of energy monitoring, improving efficiencies, reinforced by behavioural change and growth in the use and delivery of renewable energy resources.

I welcome the expansion of the energy programme into a broad coalition with stakeholders across South Dublin County and encourage partnerships, sharing knowledge to all our benefit, particularly in the context of our current economic climate.

Councillor Cathal King

Mayor of South Dublin County

EXECUTIVE SUMMARY

The South Dublin Sustainable Energy Action Plan (SEAP) puts forward an energy roadmap, setting out how the County can take the lead in addressing EU and national energy targets to 2020. The SEAP has been undertaken in partnership with the Town and Country Planning Association (TCPA) and eight other local authorities across the EU, as part of the Leadership for Energy Action and Planning (LEAP) programme, funded by EU Intelligent Energy Europe (IEE). The South Dublin SEAP has also been prepared with input from the Sustainable Energy Authority of Ireland (SEAI) and City of Dublin Energy Management Agency (CODEMA).

The South Dublin SEAP has been prepared in response to energy targets set out in EU legislation and policy. The EU Climate and Energy Package introduced in 2007, commits Europe to transforming itself into an energy efficient, low carbon economy. A series of climate and energy targets known as the "20-20-20" targets were set and these have been implemented by member states across the EU. In Ireland, EU energy targets have resulted in the development of the National Energy Efficiency Action Plan (NEEAP) 2009-2020 and the National Renewable Energy Action Plan (NREAP) 2010. To respond to EU and national policy, the Council has previously prepared the South Dublin County Council Sustainable Energy Strategy 2008 and South Dublin County Council Climate Change Strategy 2009.

The energy targets identified for the South Dublin SEAP are as follows:

- Signing up to the Covenant of Mayors commits South Dublin County Council (SDCC) to reducing CO_2 emissions by a minimum target of 20% by 2020.
- A 20% reduction in energy demand, over 2006 levels, to be achieved by improving energy efficiency. This projection is based on national commitments outlined in the National Energy Efficiency Action Plan (NEEAP) 09-2020 that commits Ireland to achieve by 2020, a 20% reduction in average 2001-2005 energy demand across the whole of the economy .
- A 33% reduction in South Dublin County Council's own energy demand to 2020. This projection is based on the public sector commitments outlined in National Energy Efficiency Action Plan (NEEAP) 2009-2020.
- 16% of national final energy consumption to be from renewables by 2020, as outlined in the National Renewable Energy Action Plan (NREAP) 2010.

By committing to the Covenant of Mayors and recognising the need for a targeted policy response to EU and national energy targets, South Dublin County Council recognises that a more co-ordinated, evidence based approach is required to sustain a countywide commitment to the energy challenge.

In pursuit of a co-ordinated response to the energy challenge, South Dublin County Council has made significant progress in reducing its own energy consumption across its buildings, facilities and operations. The Council has acknowledged the need to develop civic leadership in this area, to encourage a reduction in energy use across all sectors. To consolidate its efforts, SDCC has developed three guiding principles, to frame SEAP objectives and actions across all sectors, as follows:

Record – An evidence based approach to energy management should be developed across all sectors. From establishing a countywide baseline through to encouraging all energy users to undertake energy audits themselves, energy used and associated costs can be measured and progress monitored.

Reduce – For all sectors there is a recognised need to increase energy efficiency of buildings, facilities and operations and to increase energy awareness and behavioural change. SDCC has gained significant experience in these areas in recent years and the opportunity now exists for this experience to be folded out across all sectors.

Replace – SDCC recognises that growth in the generation and increased use of energy from renewable sources across the County, is central to the achievement of 2020 energy targets. Through the South Dublin SEAP, the Council aims to identify renewable energy opportunities, from the County to local level.

To develop an evidence based approach and to ascertain South Dublin County's total final energy consumption and CO_2 emissions to 2020, a countywide baseline emissions inventory for 2006 was completed. This year was chosen as the baseline year, due to the availability of reliable data, including Census of Population and National Transport Authority (NTA) data. Across the commercial, residential, transport and municipal sectors, South Dublin County consumed approximately 6.83 TWh of energy in 2006; this is equivalent to carbon dioxide (CO_2) emissions of approximately 2,396 ktonnes.

To predict the likelihood of achieving SEAP energy targets, a range of different national economic growth scenarios and related impact on the 2006 baseline emissions inventory have been considered. The scenario most relevant to the current and predicted economic climate in Ireland to 2020, is identified as the Sustainable Energy Authority of Ireland (SEAI) NEEAP (National Energy Efficiency Action Plan) / NREAP (National Renewable Energy Action Plan) Scenario. Based on the 2006 countywide baseline emissions inventory, the NEEAP / NREAP scenario projections to 2020, identify a shortfall in the South Dublin County energy efficiency target by 13% and the CO_2 reduction target by 11%.

In order for South Dublin County to achieve 2020 targets, it is necessary to promote an increased take up of existing energy efficiency and CO_2 emissions reduction actions, combined with a range of new locally based actions. South Dublin County Council aims to address the shortfall in achieving targets, by putting forward SEAP actions in areas that it has influence on / control over. SEAP actions are structured under the guiding principles of 'Record, Reduce and Replace'.

To achieve energy targets, whether at a County or local level, recording energy information is a necessary first step. SEAP 'Record' actions promote an evidence based approach to energy management and focus on streamlining the compilation of energy data and indicators across sectors, to provide robust data for: geographically mapping energy use, identifying specific energy measures / technologies and facilitating preparation of energy studies by wider stakeholders. Over the years, South Dublin County Council has gained significant experience in the following areas: piloting energy efficiency projects across building stock, facilities and operations, developing citizen involvement campaigns and integrating land use and transport planning to create sustainable communities. Through a range of SEAP 'Reduce' actions reflecting this experience, the opportunity now exists for capacity building to be folded out across all sectors. SEAP 'Replace' actions set out both a strategic and local approach to exploring renewable energy alternatives in the County, facilitating knowledge sharing across all stakeholders, in particular for the private sector.

To reach out to end users, further the institutionalisation of LEAP within SDCC and to ensure the implementation of the South Dublin SEAP, SDCC has set up a number of energy action groups, consisting of a range of multi-disciplinary staff from across the organisation.

The South Dublin SEAP represents a key milestone in addressing the energy challenge at a local level. In consideration of more long term energy targets and by signing up to the Covenant of Mayors (COM), South Dublin County Council is committed to monitoring and updating the SEAP on an annual basis, assisting stakeholders in identifying financing options and fostering a collaborative approach in addressing energy needs across South Dublin County.

To bring the South Dublin SEAP to life and to empower change at a local level, South Dublin County Council has initiated citizen and stakeholder involvement campaigns. To date, SDCC has facilitated wider energy engagement through workshops, one day conferences, exhibitions and social media. Further interaction with residents, schools, businesses, public bodies, community groups, industry, transport companies and private individuals, is critical to the delivery of SEAP actions and the associated attainment of energy targets.

On Thursday 21st February 2013, Minister for Communications, Energy & Natural Resources, Pat Rabbitte, T.D and Mayor Cathal King, launched the Draft South Dublin SEAP on public display. Speaking at the launch event, Minister Rabbitte stated, 'I very much welcome the commitment that South Dublin County Council is showing to the Covenant of Mayors as part of the Action Plan, and by extension the ambition to reduce its CO_2 emissions by a minimum of 20% by 2020. I also welcome the commitment by the Council to reduce its own energy consumption by 33% in 2020 and to achieve a 16% target for national final energy consumption through renewable energy sources, in 2020'.

Mayor Cathal King has welcomed the South Dublin SEAP stating, 'To sustain and encourage further growth in our County across all sectors, we all need to become better informed about how to reduce energy costs, be more energy efficient and learn how to harness renewable energy alternatives'.

Minister Pat Rabbitte TD and Mayor Cathal King at Draft SEAP launch

A total of five submissions were received and a Managers Report was prepared summarising and responding to these submissions. No amendments to the Draft South Dublin SEAP document were made following the public consultation process.

CHAPTER 1: INTRODUCTION

South Dublin County Council signed up to the Covenant of Mayors on the 11th June 2012. The Covenant of Mayors is an initiative of the European Commission that brings together Mayors from across Europe, in a shared, voluntary commitment to reducing CO_2 emissions by a minimum target of 20% by 2020. For South Dublin County, this target is based on a reduction over countywide 2006 baseline levels. In addition to the preparation of a Sustainable Energy Action Plan, the Covenant of Mayors requires the Council to prepare regular valuation reports, promote knowledge and best-practice on energy in their area of influence and share capacity-building experiences at local, regional and national level.

South Dublin County Council has prepared this Sustainable Energy Action Plan in partnership with the Town and Country Planning Association (TCPA) and eight other local authorities across the EU, as part of the EU Intelligent Energy Europe (IEE) funded, Leadership for Energy Action and Planning (LEAP) programme (www.leap-eu.org). LEAP aims to increase the ability of EU local authorities to pioneer and promote the use of sustainable energy measures and the move towards a low-carbon local economy. The South Dublin SEAP has also been prepared with the additional support of the Sustainable Energy Authority of Ireland and CODEMA.

Since its establishment, South Dublin County Council has endeavoured to promote environmental efficiency at all levels through a more sustainable development pattern linked to transport systems. The Council has a strong track record in carrying out energy efficiency and awareness programmes and upgrading / refurbishment projects, based on a strong corporate energy policy structure. The Council is committed to acting as a focal point for the reduction of energy usage and the growth of renewable energy technologies and strategies in South Dublin County.

The South Dublin SEAP will analyse the County's total final consumption and carbon dioxide (CO_2) emissions, based on a countywide 2006 baseline emissions inventory. It will set out how South Dublin County can reduce total final consumption and CO_2 emissions, in line with 2020 targets, through improved efficiency in buildings across all sectors, energy reduction in the transport sector, and increasing the level of energy generated from renewable energy sources.

South Dublin County Council's involvement in the Leadership for Energy Action and Planning (LEAP) programme and the preparation of this Sustainable Energy Action Plan (SEAP) is recognised as a strategic first step in stimulating wider understanding of energy issues and in communicating opportunities available across all sectors, in particular for South Dublin residents and businesses.

The EU has set the longer term target date of 2050 to deliver 80% - 95% CO_2 emission reductions below 1990 levels. By signing up to the Covenant and preparing this Plan, South Dublin County Council is taking an important step in recognising and addressing these long term EU energy targets.

The Sustainable Energy Action Plan (SEAP) is structured as follows:

Chapter 2: Legislation / Policy Background &Targets

This chapter sets out the legislation and policy that support the preparation of the South Dublin SEAP. Against this policy background, a series of 2020 energy targets have been identified to inform SEAP actions required across all sectors.

Chapter 3: Principles, Themes & Objectives

In this chapter, the key guiding principles, theme areas and objectives that underpin the development and implementation of the South Dublin SEAP, are set out.

Chapter 4: South Dublin County Total Final Consumption & CO2 Emissions 2006

This chapter sets out the 2006 baseline total final consumption and CO_2 emissions for South Dublin County. It is against this baseline scenario that SEAP 2020 targets and the actions required to reach them, will be based.

Chapter 5: Achieving SEAP Targets

This chapter sets out SEAP targets for both energy consumption and CO_2 emissions to 2020 and outlines the various strategies to meet these targets.

Chapter 6: SEAP Actions

In this chapter a range of energy actions across all sectors will be presented, structured under the SEAP principles of Record, Reduce and Replace. Actions will have particular focus on areas that South Dublin County Council has influence on and control over.

Chapter 7: Organisation Framework, Stakeholder & Citizen Involvement and Financial Aspects

This chapter outlines the South Dublin County Council framework put in place to ensure the delivery of the South Dublin SEAP and the broader SDCC energy programme. The role of stakeholders and the wider public is key to the preparation and implementation of the South Dublin SEAP; in this chapter the strategy for stakeholder and citizen involvement is outlined. Sources of potential funding for SEAP implementation are also identified in this chapter.

Chapter 8: Monitoring & Review

By signing up to the Covenant of Mayors and submitting a SEAP for Covenant of Mayors approval, South Dublin County Council commits to updating and monitoring SEAP implementation. This chapter sets out an approach to reviewing and updating SEAP delivery across South Dublin County.

Chapter 9: Conclusions

This chapter presents the main conclusions reached, having regard to SEAP actions across all sectors, renewable energy, investment and finance, future policy and actions in Ireland and a view beyond 2020 and implications for South Dublin County.

CHAPTER 2: LEGISLATION / POLICY BACKGROUND AND TARGETS

2.1 EU / National Legislation & Policy Background

The targets identified for the SEAP are underpinned by legislation and policy at a European level; these EU targets have been adopted nationally and inform the development of energy policy at regional / county level. Key influencing policy / legislation documents are detailed as follows:

National Climate Change Strategy 2007-2012

The National Climate Change Strategy 2007 - 2012 sets out a range of measures to ensure Ireland reaches its target under the Kyoto Protocol. The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), adopted in December 1997, sets binding obligations on countries to reduce emissions of greenhouse gases. The EU committed itself to reduce greenhouse gases, including carbon dioxide. In response to the Kyoto Protocol, the National Climate Change Strategy provides a framework for action to reduce Ireland's greenhouse gas emissions within a five year period.

EU End User Efficiency and Energy Services Directive (ESD2006/32/EC)

This is a framework to ensure that when energy is finally consumed it is done so in a more efficient and economic way. This directive led to the development of the National Energy Efficiency Action Plan (NEEAP) 2009-2020.

The EU Climate and Energy Package

In March 2007, the EU's leaders endorsed an integrated approach to climate and energy policy that aims to combat climate change and increase the EU's energy security while strengthening its competitiveness. They committed Europe to transforming itself into a highly energy efficient, low carbon economy. A series of climate and energy targets to be met by 2020 were set; these are known as the "20-20-20" targets and are key to determining subsequent national policy.

These EU wide targets are as follows:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- Raising the share of EU energy consumption produced from renewable resources to 20%;
- A 20% improvement in the EU's energy efficiency.

National Energy Efficiency Action Plan (NEEAP) 2009-2020

Ireland's 2009-2020 National Energy Efficiency Action Plan builds on the previous plan submitted to the European Commission in 2007. Published in May 2009, the updated plan outlines 90 measures towards achieving, a 20% reduction in energy demand (over average 2001-2005 levels) across the whole of the economy through energy efficiency measures by 2020. Recognising that Government must lead by example, the public sector is committed to achieving a 33% reduction in energy use.

EU Renewables Directive (ESD2009/28/EC)

The Renewables Directive mandates levels of renewable energy use within the European Union. The directive requires member countries to produce a pre-agreed proportion of energy consumption from renewable sources such that the EU as a whole shall obtain at least 20% of total energy from renewables by 2020.

National Renewable Energy Action Plan (NREAP) 2010

Ireland's renewable energy target under the Renewables Directive is that 16% of national fuel energy shall be consumption from renewable sources, as set out in the National Renewable Energy Action Plan. This plan sets out Ireland's national trajectories for the share of energy from renewable sources to be consumed in transport, electricity and heating and cooling to 2020.

EU Energy Efficiency Directive 2012/27/EU

On 25th October 2012, the EU adopted the Directive 2012/27/EU on energy efficiency. This Directive establishes a common framework of measures for the promotion of energy efficiency within the European Union in order to ensure the achievement of 20% headline target on energy efficiency by 2020 and to pave the way for further energy efficiency improvements beyond that date. It lays down rules designed to remove barriers in the energy market and overcome market failures that impede efficiency in the supply and use of energy, and provides for the establishment of indicative national energy efficiency targets for 2020.

2.2 Regional/County Policy & Strategies

A series of regional and county policies and strategies also address a range of energy issues and objectives, as well as translating EU targets into more locally based plans and strategies. These include the following;

Regional Planning Guidelines for the Greater Dublin Area 2010-2022

The Regional Planning Guidelines for the Greater Dublin Area provide for an integrated model of policy development, with economic, infrastructure and settlement policies being interdependent. More specifically the following strategic recommendations are identified as being of particular relevance within the SEAP context:

- Development Plans and Local Authorities support, through policies and plans, the targets for renewable generation so that renewable energy targets for 2020 are met;
- That low carbon sustainable renewable energy systems, bio-energy and energy conservation potentials are exploited to their full potential.

South Dublin County Council Development Plan 2010-2016

The South Dublin County Council Development Plan 2010 – 2016 sets out the spatial planning framework for South Dublin County, within the context of national and regional policies. The Plan seeks to promote a more consolidated and compact urban form and presents a series of policies that aim to ameliorate the effects of climate change and introduce resilience to these effects. The Plan also supports the exploitation and development of renewable energy alternatives.

The Development Plan contains a number of policies that promote greater emphasis on implications of energy demand on design of buildings. The ultimate aim of these policies is to ascertain the level to which a development will be deemed successful and sustainable. The policies promote passive design standards, adaptability in building design and greater efficiency in the energy performance of both new and existing buildings in South Dublin County.

The Development Plan acknowledges that renewable energy sources have an important role to play in achieving national targets in relation to reductions in fossil fuel dependency and, by implication, greenhouse gas emissions. In line with the principles of sustainable development, the Development Plan contains a number of policies that support and prioritise the development of renewable energy resources i.e. geothermal and wind energy, and the maximisation of electricity production from renewable sources.

The Development Plan also promotes an evidence based approach to preparation of a countywide sustainable energy policy. It is an objective of the Plan to prepare an energy mapping system to be rolled out throughout the county on an appropriate phased basis.

South Dublin County Council Sustainable Energy Strategy 2008

The South Dublin County Council Sustainable Energy Strategy was prepared by an interdepartmental, multidisciplinary Working Group. The strategy outlines aims and objectives for achieving improvements in energy systems and supplies, resulting in greater efficiencies while securing long term sustainability with limited impact on climate, local environment and public health.

South Dublin County Council Climate Change Strategy 2009

The South Dublin County Council Climate Change Strategy was prepared through the Environment Strategic Policy Committee (SPC) and with the support of City of Dublin Energy Management Agency (CODEMA). The Climate Change Strategy is in accordance with the National Climate Change Strategy and covers the years 2009-2012 in the short-term, but also takes into account a medium-term view to 2020 and beyond. Five focus sections have been chosen for the strategy - energy, planning, transport, waste management and biodiversity. Actions and key performance indicators under each of these headings are set out in the strategy.

2.3 Towards an Evidence Based Approach

The Council's commitment to the public sector energy targets of the National Energy Efficiency Action Plan (NEEAP) 2009-2020 has resulted in its engagement with SEAI's Energy Management Action Plan (MAP). The programme aims to prioritise energy use and efficiency across all Council operations and functions. An interdisciplinary team of Council staff has been established, comprising staff from a range of technical backgrounds and an 'Energy Champion' has been appointed. Central to the development of the project is the establishment of an energy baseline of Council activities and the identification of energy efficient measures and initiatives ('Register of Opportunities') that will reduce South Dublin County Council's own energy use, cost and associated CO_2 emissions. Participation in the Energy Management Action Plan programme has allowed energy efficiency to become a priority in Council operations and has created momentum for the implementation of a wider range of energy saving initiatives.

The policy / legislation detailed above demonstrate South Dublin County Council's commitment to addressing the energy challenge within its own structure and responsibilities. The adoption of the South Dublin County

Council Development Plan 2010-2016, strongly underpinned the Councils commitment to increasing energy awareness and energy action through a range of energy policies that encourage sustainable energy use and support the development of alternative energy sources, at the scale of the County as a whole.

Committing to Covenant of Mayors and recognising the need for a targeted policy response to EU and national energy targets, a more co-ordinated, evidence based approach is clearly required to sustain a countywide commitment to the energy challenge. SDCC has engaged with the Leadership for Energy Action & Planning programme as a means of producing a Sustainable Energy Action Plan that puts forward robust actions across all sectors, which represent a meaningful way forward in enabling change at all levels from Local Authority areas of influence, through to the local, business and community level. Involvement in LEAP allows SDCC to learn best practice from other partner Local Authorities across the EU in developing this evidence and monitoring based approach to energy policies to 2020 and beyond.

2.4 Targets

The legislation / policy section above outlines energy targets to 2020; the South Dublin SEAP aims to respond to these targets. The 2006 baseline emissions inventory has been collated under four main sector headings: Residential, Commercial, Transport and SDCC's own energy use, primarily having regard to the availability and compilation of available data. Census and National Transport Authority (NTA) traffic modelling data which were undertaken in 2006 were also evaluated.

The South Dublin Sustainable Energy Action Plan has been developed with regard to the following key national energy targets:

- Signing up to the Covenant of Mayors commits South Dublin County Council to reducing CO_2 emissions by a minimum target of 20% by 2020, based on the South Dublin County 2006 baseline year.
- A 20% reduction in energy demand below 2006 baseline levels to 2020, to be achieved by improving energy efficiency. This projection is based on national commitments outlined in the National Energy Efficiency Action Plan (NEEAP) 2009-2020 that commits Ireland to achieve by 2020, a 20% reduction in average 2001-2005 energy demand across the whole of the economy .
- A 33% reduction in South Dublin County Council's own energy demand to 2020, based on a 2010 baseline inventory. This projection is also based on the public sector commitments outlined in National Energy Efficiency Action Plan (NEEAP) 2009-2020.
- 16% of national final energy consumption to be from renewables by 2020, as outlined in the National Renewable Energy Action Plan (NREAP) 2010.

Based on the above targets, the South Dublin SEAP represents a significant first step in translating 2020 energy targets to County and local level. The production, updating and monitoring of the SEAP also allows South Dublin County to be better placed in addressing future international and EU energy targets. On a more long-term basis, the UN Intergovernmental Panel on Climate Change (IPCC) has determined that the developed countries of the world will need to reduce their CO_2 emissions by 80% over 1990 levels, by 2050. The EU target to 2050 is to deliver energy related CO_2 emission reductions in the range of 80% - 95% over 1990 levels.

CHAPTER 3: PRINCIPLES, THEMES & OBJECTIVES

3.1 Introduction

South Dublin County Council has a track record in energy efficiency and refurbishment projects, awareness programmes and developing sustainable communities. In consideration of SEAP energy targets and to further its role as an exemplar in developing energy policies linked to encouraging change at a local level, there is a need to consolidate experiences to date and underpin the South Dublin SEAP in a set of robust key principles, themes and objectives.

3.2 Principles

It is recognised that there is a need for a strong evidence base to determine actions required to reverse previous energy trends. To date, there has been a lack of a consolidated evidence-based approach to addressing the energy challenge in the County. Whilst significant progress has been made in reducing South Dublin County Council's own energy consumption across its buildings, facilities and operations, there is a need to develop civic leadership in this area and encourage a reduction in energy use by identifying energy measures across all sectors. There is recognised potential for renewable alternatives in South Dublin County but also the need for a policy approach in this area. The South Dublin SEAP represents an opportunity to identify renewable alternatives across sectors and encourage collaboration in developing a countywide Local Authority Renewable Energy Strategy (LARES). As such, the following key principles underpin the South Dublin Sustainable Energy Action Plan:

Record
Promote an evidence based approach to energy management across all sectors, from establishing an energy baseline at county level, through to facilitating and encouraging all energy users to undertake energy audits and start addressing energy management by recording total energy demand and CO_2 emissions themselves. This approach provides an opportunity for energy mapping and modelling from local to county scale, which can facilitate SEAP monitoring and reviewing. SDCC has commenced energy mapping, based on the collation of energy data for Tallaght (the county town); mapping has been prepared for both electricity and space heating across energy users, for the Tallaght town centre area and its environs.

Reduce
The South Dublin SEAP presents actions demonstrating examples of how to reduce energy demand, costs and CO_2 emissions across all sectors. For all stakeholders, there is a need to increase energy efficiency and awareness in the following main areas: building and facilities energy efficiency measures, transport related actions, strategic land use planning and citizen / stakeholder campaigns. South Dublin County Council has gained experience in these areas over recent years and the opportunity now exists for this experience to be folded out across all sectors, in conjunction with developing a structured approach to communicating and delivering change to all sectors.

Replace
Central to the achievement of 2020 energy targets is growth in the generation and increased use of energy from renewable sources across South Dublin County. Potential action areas include renewable technologies for individual buildings, district heating and the development of Energy Service Companies (ESCOs), the preparation of a Local Authority Renewable Energy Strategy (LARES) and knowledge sharing and capacity building in renewable opportunities for businesses and homeowners.

3.3 Themes

In response to the key principles outlined above and in consideration of the energy targets that frame the formulation of the South Dublin SEAP, the SDCC response has been to focus SEAP objectives and action delivery under the following key areas:

Theme	Description
Institutional / Commercial	Address energy use across all South Dublin County Council buildings, public lighting, fleet, functions and operations and consolidate previous experiences to develop a best practice approach demonstrating leadership to all sectors. Address the energy needs of large institutions in South Dublin County such as hospital / health facilities, third level and other education facilities. There is also a recognised potential for working in partnership with these institutions to develop specific research / pilot projects that can inform SEAP action development, monitoring and updating. SDCC has established relationships with stakeholders in the business sector, including the South Dublin Chamber of Commerce. The delivery of SEAP will assist development of stakeholder groups to address the energy needs, increase competitiveness and reduce costs for South Dublin businesses.
Residential / Community	Reducing energy costs for South Dublin residents and community groups is central to the delivery of the South Dublin SEAP, as is the compilation of energy actions to empower change at the local level. South Dublin County Council has significant experience in recording energy data related to upgrading and refurbishment of its housing stock; an opportunity exists to develop this methodology to inform Building Energy Rating (BER) improvements across both public and private residential dwellings in South Dublin County. The Council also has significant experience in engaging stakeholders and the general public; through SEAP preparation and implementation SDCC aims to build on this experience and provide reliable, meaningful energy engagement with South Dublin residents and community groups.
Land Use Planning / Transport	The transport sector is a significant contributor to CO_2 emissions in South Dublin County. In addressing this challenge to date, SDCC has a proven track record in integrating land use and transport planning, in particular, the development of sustainable communities focused on public transport delivery. Furthermore, SDCC, in partnership with the National Transport Authority (NTA) and Department of Transport, Tourism & Sport, has undertaken a number of Smarter Travel projects, which can assist in developing best practice in encouraging a change in travel choices at the local level, which can cumulatively address the CO_2 emissions from this sector.

3.4 Objectives

Based on the key underlining principles and theme areas outlined above, a number of key objectives have been identified that will frame the compilation of SEAP actions:

- Reduce South Dublin County's CO_2 emissions from 2,396 ktonnes in 2006 to 1,915 ktonnes in 2020 (20% reduction);
- Improve energy efficiency and value for money in energy spending across all sectors in the County;
- Stimulate job creation in the energy efficiency and renewable energy sectors;
- Reduce the amount of energy imported by the County;
- Increase the share of renewable energy generated in the County;
- Progress SDCC's own energy projects / programmes and continue to communicate these experiences to inform best practice across all sectors;
- Improve energy efficiency and better use of fuel for South Dublin residents and communities;
- Increase energy awareness amongst South Dublin residents and community groups;
- Improve quality of life and thermal comfort for residents in the County and help reduce the risk of fuel poverty;
- Reduce energy costs for businesses in the County and increase economic competitiveness;
- Encourage an increased modal split towards sustainable modes of transport, including pedestrians/cyclists and public transport, across the County and reduce CO_2 emissions in this sector;
- Inform future sustainable development and energy policies in the County; and
- Share knowledge and facilitate capacity building at local, regional and national level.

CHAPTER 4: SOUTH DUBLIN COUNTY TOTAL FINAL CONSUMPTION & CO_2 EMISSIONS 2006

4.1 Collection of Data

To project South Dublin County total final consumption and CO_2 emissions to 2020, 2006 was chosen as the baseline year. This year was chosen due to the availability of reliable data, in particular the Census of Population (CSO) and National Transport Authority (NTA) household survey and associated traffic modelling data. Data was collated under residential, transport and commercial headings as the data available and methodologies used for review, were best collated and represented under these main sector headings.

In compiling the 2006 baseline for the residential, transport and commercial sectors, methodologies for the collection of energy data and associated research to support the Tallaght Sustainable Energy Community (SEC) were reviewed. Tallaght was selected in 2011 by the Sustainable Energy Authority of Ireland (SEAI) as one of three new exemplar Sustainable Energy Communities in Ireland (www.seai.ie/sec). The key aim of this programme is to develop a series of Irish communities as evidence based 'living laboratories' to establish a culture of innovation and facilitate the emergence of new sustainable energy technologies and practices that grow energy smart towns and cities.

A review of data for the largest energy users in the Tallaght town centre area was also undertaken; much of this data was provided by the energy users directly, as stakeholders in the Tallaght Sustainable Energy Community (SEC) initiative. Consultation was also undertaken with key stakeholders including SEAI, CODEMA, National Transport Authority (NTA), Health Service Executive (HSE), with regard to relevant energy data previously gathered, all of which informed the baseline results.

In order to compile data for South Dublin County Council itself, 2010 was chosen as a baseline year, as this was the year that the most reliable data was available for the range of Council owned buildings, operations and facilities – including County Hall, libraries, Civic Theatre, depots, leisure centres, public lighting and enterprise centres. This baseline also followed a review of South Dublin County Council's 'Register of Opportunities' prepared under the Energy Management Action Plan (MAP). South Dublin County Council recently signed up to SEAI's 'Public Sector Energy Partnership Programme 2012', with the expectation that more detailed data on annual SDCC energy usage will be available for analysis. SEAP updates and monitoring in the future, can take cognisance of updated energy information that becomes available, resulting from involvement in this programme.

More detailed information on methodologies used to determine total South Dublin County energy consumption and CO_2 emissions in 2006 is contained in the accompanying Baseline Emissions Inventory (BEI) in Appendix A.

4.2 South Dublin County Total Final Consumption and CO_2 Emissions 2006

Across all sectors, South Dublin County consumed approximately 6.83 TWh of energy in 2006; this is equivalent to CO_2 emissions of approximately 2,396 ktonnes, as outlined in Tables 4.1 and 4.2 below.

Table 4.1: South Dublin County Total Final Consumption, TWh (2006)

Sector	Total Final Consumption (TWh)	% of Total
Residential	1.32	19%
Commercial	2.48	36%
Transport	2.99	44%
South Dublin County Council (2010)	0.05	1%
Total	6.83	100%

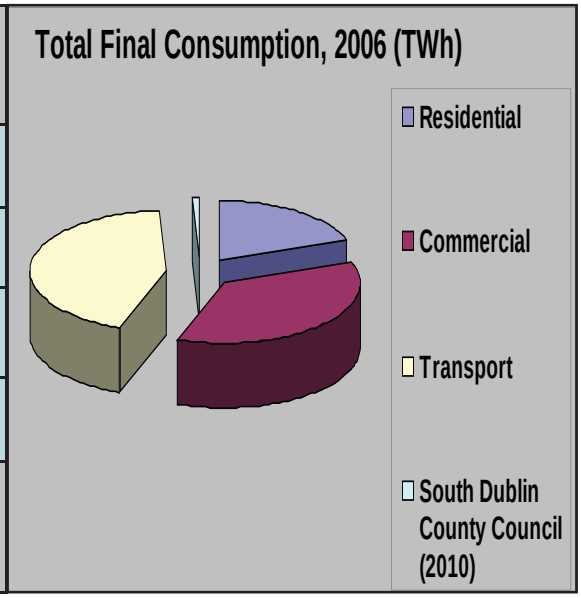
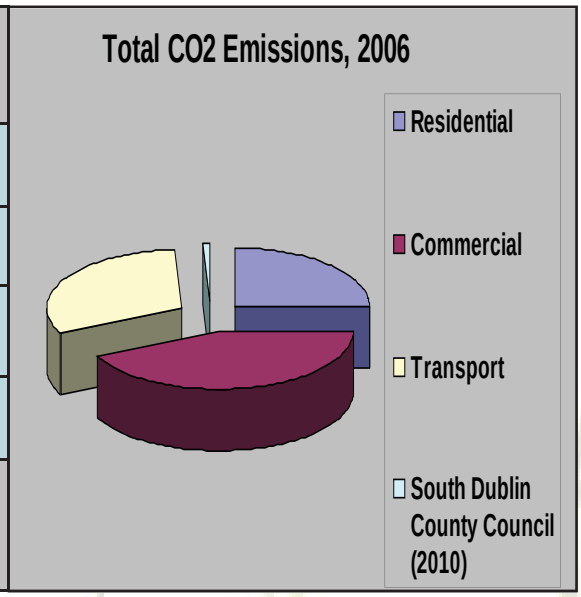


Table 4.2: South Dublin County Total CO_2 Emissions, $KTCO_2$ (2006)

Sector	Total Emissions ($KTCO_2$)	% of Total
Residential	606.9	25%
Commercial	1,014.4	42%
Transport	757.2	32%
South Dublin County Council (2010)	18.0	1%
Total	2,396.5	100%



4.3 Residential Sector - Total Final Consumption and CO_2 Emissions

Analysis of residential total final consumption for South Dublin County has been undertaken in two stages. Firstly, energy values relating to dwellings under the ownership of South Dublin County Council have been calculated. Secondly, energy values for all dwellings in South Dublin County have been subsequently extrapolated as a separate exercise. This methodology was undertaken for two main reasons; more comprehensive 'actual data' was available on the housing stock under the ownership of SDCC and the Council will have more control and involvement in Council owned dwellings, which is critical in terms of identifying and implementing future actions and energy targets.

Table 4.3: Residential Total Final Consumption & CO_2 Emissions 2006

Total Final Consumption = 1.32 TWh/yr Total CO_2 Energy Emissions = 607 Ktonnes/yr	
Average Council Dwelling	
Final Consumption ($KWh/m^2/yr$)	CO_2 Emissions ($KgCO_2/m^2/yr$)
169	65
Average Dwelling in the County	
Final Consumption ($KWh/m^2/yr$)	CO_2 Emissions ($KgCO_2/m^2/yr$)
168	77

Stage 1: Dwellings in South Dublin County

The first stage in calculating the residential baseline was to determine the energy emissions (Ktonnes/yr) and total final consumption (TWh/yr) figures for all Council owned dwellings (built before 2007). These results were based on an analysis of the BER's (Building Energy Ratings) which have been undertaken for 1,158 Council dwellings (out of a total of approximately 9,200) under South Dublin County Council ownership. A Building Energy Rating gives details on the energy performance of a dwelling in terms of primary energy usage (expressed as $KWh/m^2/yr$) and carbon emissions (expressed as kg $CO_2/m^2/yr$).

The analysis of the Building Energy Ratings was broken down into four different categories of dwelling types: detached house, semidetached house, terraced house and apartment. An analysis of Building Energy Ratings that have been undertaken by the Council revealed an average energy value for each of these dwelling types. The average CO_2 emissions for each dwelling type were also calculated from this analysis. The average energy consumption and energy emissions for each dwelling type were then used to determine the total energy consumption and total CO_2 emissions for all Council owned dwellings in 2006.

Stage 2: All dwellings in South Dublin County

The second stage involved an analysis of the Census of Population, which indicated that in 2006 there were 78,474 dwellings in South Dublin County, including all Council dwellings. A breakdown of the total number of each dwelling type: detached, semi-detached, terraced and apartment, was also determined from the Census of Population.

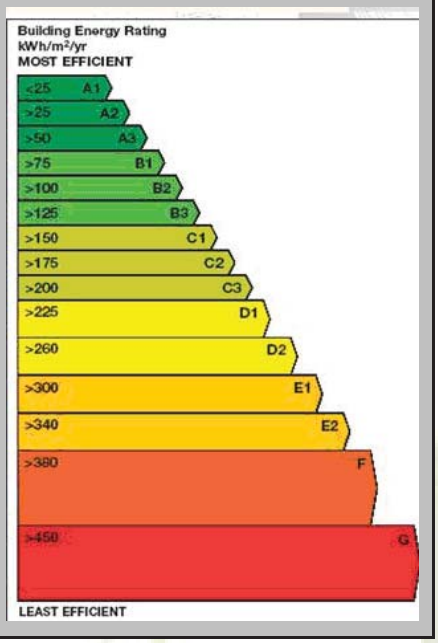
An analysis of approximately 155,000 BER's (Building Energy Ratings) nationally has been undertaken by the Sustainable Energy Authority of Ireland (SEAI). This analysis provides the average energy consumption (KWh/yr) for each dwelling type nationally and was used to determine the total energy consumption (TWh/yr) for all dwellings in South Dublin County, including Council dwellings.

The total carbon emissions (Ktonnes/yr) for the County was determined by using the average Kilogram CO_2 emissions for each Council dwelling type, which was extrapolated to calculate the total Ktonnes emissions for all dwellings in the County.

To convert residential sector calculations to total final energy consumption, SEAI standards for electricity use per dwelling type in Ireland were used.

Table 4.4 shows a comparison between total final energy consumption for Council dwellings by type, compared to all dwellings in the County. A corresponding primary energy consumption figure has been used to calculate a BER rating, to compare different dwelling types. Each dwelling type has been colour coded in line with BER standards. Overall, the average Council dwelling performs very similar to the average dwelling in the County, in terms of energy consumption and CO_2 emissions.

Table 4.4: Average BER classification, energy consumption (KWh) and energy emissions (CO_2) per year by dwelling-type for both Council dwellings and all dwellings in the County, 2006

	Average Final Energy Consumption ($KWh/m^2/yr$)	Equivalent BER rating (see note)	Average CO_2 Emissions ($KgCO_2/m^2/yr$)	Building Energy Rating Certificate (BER)
Council Dwellings				
Terrace	170	D2	65	
Apartment	141	D2	62	
Semi-Dteached	114	C3	46	
Detached	280	E2	96	
All Council Dwellings	*169*	*D2*	*65*	
All Dwellings in the County				
Terrace	171	D2	71	
Apartment	67	C3	72	
Semi- Detached	170	D2	67	
Detached	189	D2	124	
All Dwellings	*168*	*D2*	*77*	

Note:
Average Final Energy Consumption ($KWh/m^2/yr$) and the Equivalent BER rating are not directly comparable; nevertheless the BER gives a valuable visual presentation of average ratings.

4.4 Commercial Sector - Total Final Consumption & CO_2 Emissions 2006

Analysis of energy usage in the commercial sector was sub-divided between services, industry and community uses. For the purpose of calculating the energy baseline, these sectors have been broken into use categories as defined in the 'Chartered Institution of Building Services Engineers' (CIBSE's) Guide F - Energy Efficiency in Buildings.

The floorspace for the various uses were provided by the Valuation Office, utilising the ongoing assessment of rateable floorspace undertaken by the Valuation Office for South Dublin (up to the end of 2006). Calculations on total final consumption were then made by multiplying the floorspace for certain uses by standardised energy scores associated with such uses (based on Guide F, CIBSE) to give total final consumption for the commercial sector.

Using CIBSE standards to determine baseline energy figures has resulted in the energy usage being classified as either electricity or space heating fuels. In calculating the energy emissions (Kg CO_2), assumptions had to be made; the breakdown between oil and gas, (and also with coal in the case of industry) was determined based on Ireland's national energy profile (provided by SEAI). The total energy emissions in CO_2 were then calculated using this data and applying the SEAI standardised conversion factors.

Table 4.5: Commercial Total Final Consumption & CO_2 Emissions 2006

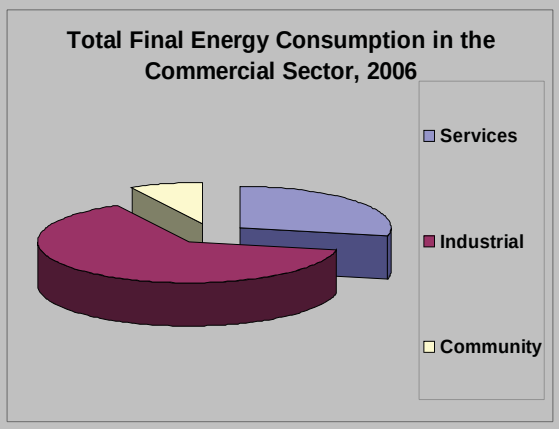
Total Final Consumption = 2.48 TWh/yr
Total CO_2 Energy Emissions = 1,014 Ktonnes/yr

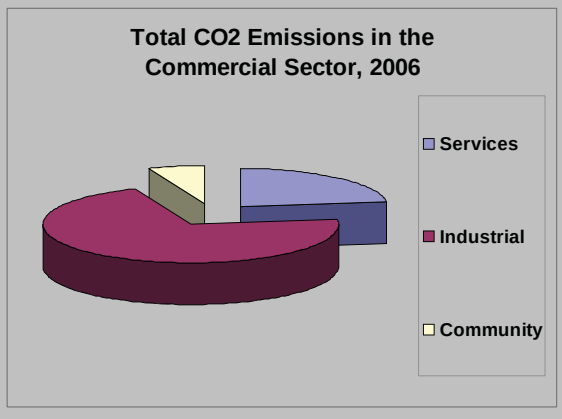
Total Final Energy Consumption

Commercial Sector	% of Total
Services	28%
Industrial	64%
Community	8%

Total CO_2 Emissions

Commercial Sector	% of Total
Services	23%
Industrial	71%
Community	6%





Two other sectors that contribute to energy consumption and its associated greenhouse gas emissions are agriculture and quarrying. Both of these sectors are represented in the South Dublin County area but have been omitted at present in the BEI calculations. Given the urban nature of the County, it is considered that both these land uses represent a very small percentage of overall land uses.

In addition, for quarrying activities some companies are engaged in carbon trading schemes making calculations of their contributions to climate change more complicated. In terms of agriculture, energy calculations for such a dispersed activity can be problematic and make it difficult to determine a methodology for such a calculation. Furthermore, large portions of the rural land within South Dublin County's boundaries are engaged in forestry which contribute to 'carbon sinks' nationally; as carbon sinks have not been subjected to a rigorous methodology as yet this would again prove problematic in terms of calculations and harmonisation with the other sectors represented. SDCC will endeavour to consider these sectors in future calculations.

4.5 Transport Sector - Total Final Consumption & CO_2 Emissions 2006

South Dublin County is strategically located along three major road corridors in the State and also Dublin's orbital motorway, the M50. As a result, the volume of vehicular traffic, including Heavy Goods Vehicles (HGV's), passing through the County, is significant. For the purposes of calculating overall transport emissions in 2006, it was considered appropriate to include emissions from 'through traffic', as this is considered a large contributing factor to overall CO_2 emissions generated in South Dublin County.

In addition, there is significant public transport provision in South Dublin County with LUAS (Dublin's light rail / tram), Dublin Bus and suburban, commuter and inter-city rail services all passing through South Dublin County. There are two aerodromes located in South Dublin County, Weston Airport (private airport) and Casement Aerodrome, Baldonnell (Department of Defence). Given the non-commercial nature of these airports and the lack of available data relating to aircraft emissions at these airports, it is not intended to include them in the transport calculations at this stage. SDCC will endeavour to consider aviation data in future calculations.

Pedestrian & Cyclist Journeys

Analysis of pedestrian and cyclist journeys was based on the Dublin Transportation Office (DTO) 'Greater Dublin Area Household Survey 2006, as provided by the National Transport Authority (NTA).

Car, Van & Heavy Goods Vehicle (HGV) Emissions

The National Transport Authority (NTA) was engaged to provide traffic data for 2006 in order to calculate car, van (classified together as Light Duty Vehicles) and Heavy Goods Vehicles (HGV) emissions. The emissions and consumption for Light Duty Vehicles (Cars and Vans) and Heavy Goods Vehicles are shown in Table 4.6. Using 2006 AADT (Annual Average Daily Traffic Flow) data, including AM and Off-Peak hours for both the Greater Dublin Region and also for the sub-set of links relating to South Dublin County, total kilometres travelled by these modes as well as total CO_2 produced was calculated. The UK standard 'Design Manual for Roads and Bridges (DMRB)' was used to calculate CO_2 emissions.

LUAS (light rail / tram system)

The National Transport Authority (NTA) traffic modelling data, based on the DTO 'Greater Dublin Area Household Survey 2006' was used to calculate LUAS energy use (TWh) and CO_2 emissions (ktonnes). The total annual personal kilometres for LUAS journeys in the South Dublin area was calculated and conversion factors provided by LUAS, were applied to calculate CO_2 emitted per passenger kilometre.

Bus

Dublin Bus provided data on 2006 annual services in the South Dublin area, including annual passenger numbers, litres of diesel, tonnes of CO_2 and KWh totals. Conversion factors from the Carbon Trust were used to convert energy consumed to CO_2 emitted.

Irish Rail

In order to capture the broad range of Irish Rail services passing through the County (sub-urban, commuter and inter-city services departing and entering Heuston Station) overall passenger numbers were used for energy calculations. Irish Rail provided estimates on the approximate number of passengers passing through Heuston Station per annum. Using this data, and calculating the kilometres of rail track in South Dublin County (approximately 7.7 kilometres), total passenger kilometres in the South Dublin area were calculated.

To calculate total CO_2 emissions for Irish Rail services, conversion factors used by the Environmental Protection Agency (EPA) were applied. Calculations for total KWh were made using the Carbon Trust diesel emission factors.

Motor Bike

NTA modelling data based on the DTO 'Greater Dublin Area Household Survey 2006' was used to calculate motorbike energy use (TWh) and CO_2 emissions (ktonnes). From this base data, the 2006 total annual personal kilometres for motorbike journeys in the South Dublin area were calculated. The UK Department of Energy & Climate Change 'Conversion Factors for Company Reporting' provided average emissions per standard motorbike passenger kilometre to give total emissions of CO_2. Energy consumption was then calculated using Carbon Trust conversion factors.

Table 4.6: Transport Total Final Consumption & CO_2 Emissions 2006

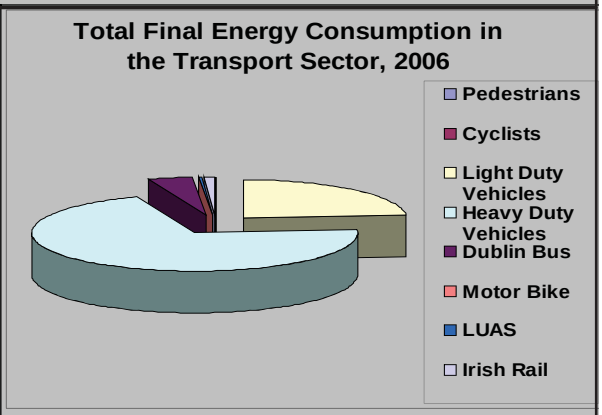
Total Final Consumption = 2.99 TWh/yr
Total CO_2 Energy Emissions = 757.2 Ktonnes/yr

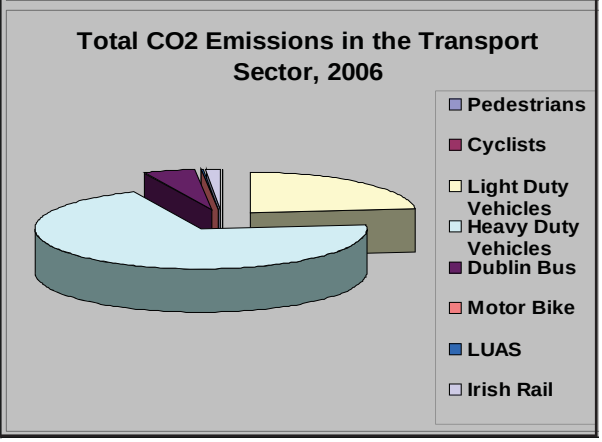
Total Final Energy Consumption

Transport Sector	% of Total
Pedestrians	0%
Cyclists	0%
Light Duty Veh.	23.8%
Heavy Duty Veh.	70.4%
Dublin Bus	4.3%
Motor Bike	0%
LUAS	0.3%
Irish Rail	1.2%

Total CO_2 Emissions

Transport Sector	% of Total
Pedestrians	0%
Cyclists	0%
Light Duty Veh.	23.3%
Heavy Duty Veh.	70.1%
Dublin Bus	4.8%
Motor Bike	0.1%
LUAS	0.3%
Irish Rail	1.4%





4.6 South Dublin County Council Total Final Consumption and CO2 Emissions 2010

An energy baseline for all Council buildings, facilities, public lighting and fleet was calculated for the baseline year of 2010, as this is when the most detailed data is available and when the measuring of the energy usage in many of the Council facilities commenced. The total final consumption was 0.047 TWh/yr and CO_2 emissions of 18 Ktonnes/yr.

Table 4.7: South Dublin County Council Total Final Consumption & CO_2 Emissions 2010

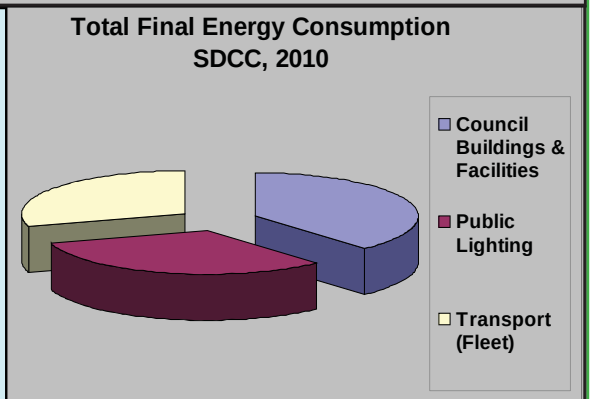
Total Final Consumption = 0.047 TWh/yr
Total CO_2 Energy Emissions = 18 Ktonnes/yr

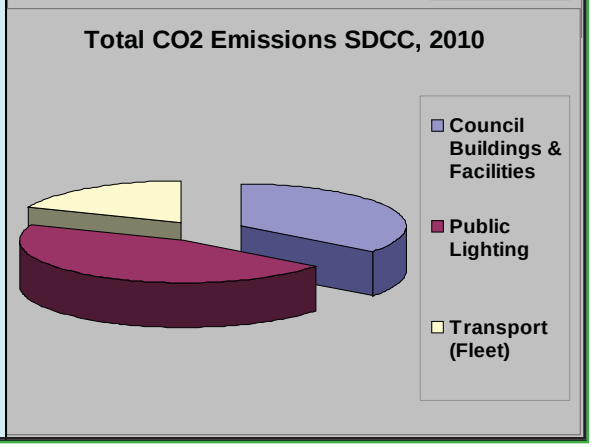
Total Final Energy Consumption

SDCC Sector	% of Total
Council Buildings & Facilities	38%
Public Lighting	32%
Transport (Fleet)	30%

Total CO_2 Emissions

SDCC Sector	% of Total
Council Buildings & Facilities	35%
Public Lighting	46%
Transport (Fleet)	19%





CHAPTER 5: ACHIEVING SEAP TARGETS

5.1 Introduction

To determine South Dublin County total final consumption and CO_2 emissions across all sectors to 2020, South Dublin SEAP energy targets (set out in Chapter 2) have been applied to the 2006 baseline scenario. For South Dublin County Council's own total final consumption and CO_2 emissions, the public sector energy target has been applied to the 2010 baseline scenario. Energy consumption and CO_2 emissions across all sectors in South Dublin County in 2020, compared to the baseline scenario, are presented in Table 5.1.

Table 5.1: Total Final Consumption and CO_2 Emissions in South Dublin County per Sector 2006 / 2020

Sector	2006 Final Consumption (TWh)	Projected 2020 Final Consumption (TWh)	2006 CO2 Emissions (Ktonnes)	Projected 2020 CO2 Emissions (Ktonnes)
Residential	1.32	1.06 (20% reduction)	607	486.0 (20% reduction)
Commercial	2.48	1.98 (20% reduction)	1,014	811.2 (20% reduction)
Services	0.70	0.56 (20% reduction)	308	246.4 (20% reduction)
Industrial	1.59	1.27 (20% reduction)	650	520.0 (20% reduction)
Community	0.19	0.15 (20% reduction)	56	44.8 (20% reduction)
Transport	2.99	2.39 (20% reduction)	757	605.6 (20% reduction)
SDCC (2010)	0.05	0.03 (33% reduction)	18	12.1 (33% reduction)
Total	6.83	5.46	2,396	1,915

To predict the likelihood of achieving energy targets in South Dublin County, a range of different national economic growth scenarios and related impact on total energy consumption, have been considered. These scenarios are presented by two leading research organisations in Ireland – the Sustainable Energy Authority of Ireland (SEAI) and the Economic and Social Research Institute (ESRI).

The scenario most relevant to the current and predicted economic climate in Ireland to 2020, is identified as the Sustainable Energy Authority of Ireland (SEAI) NEEAP (National Energy Efficiency Action Plan) / NREAP (National Renewable Energy Action Plan) Scenario.

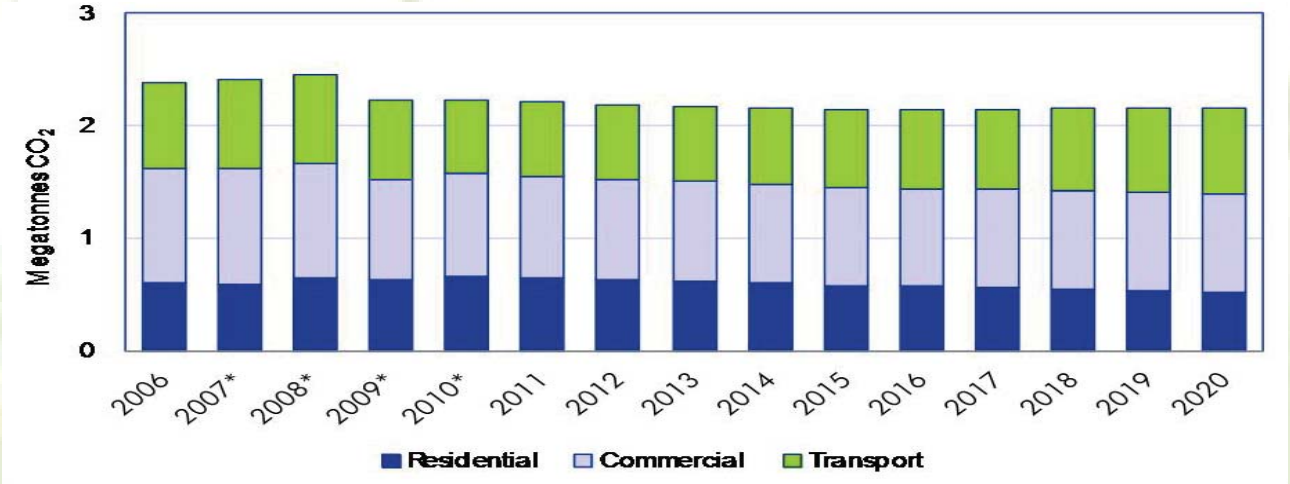
5.2 NEEAP/NREAP Scenario

SEAI's NEEAP/NREAP scenario was used to inform how South Dublin County will address energy consumption and CO_2 emissions targets to 2020, as this scenario is considered most representative of current and predicted economic growth in Ireland. This scenario assumes low economic growth in Ireland to 2020 and takes into account all national measures and actions that are included in both NEEAP and NREAP towards achieving national energy targets. The NEEAP/NREAP scenario calculations exclude SEAP actions included in Chapter 6. A full list of all the measures applied in the NEEAP/NREAP Scenario, is contained in Appendix B. The predicted energy consumption and CO_2 emission figures for South Dublin County using this scenario are shown in Figures 5.1 and 5.2. These figures show how the NEEAP/NREAP scenario was applied specifically to South Dublin County's energy use in 2006 and what affect that has per sector, year on year, towards energy targets.

Figure 5.1: Projected Total Final Energy Consumption in TWh per sector based on SEAI NEEAP/NREAP scenario

The NEEAP/NREAP scenario shows total final energy consumption for South Dublin County falling from 6.8 TWh to 6.3 TWh, a total reduction of 7.3% or 0.5 TWh. The corresponding CO_2 related reduction, predicts a decrease in South Dublin County emissions, from 2,397 Kt/yr to 2,174 Kt/yr, a 9.3% reduction. This is expressed in megatonnes per sector in Figure 5.2.

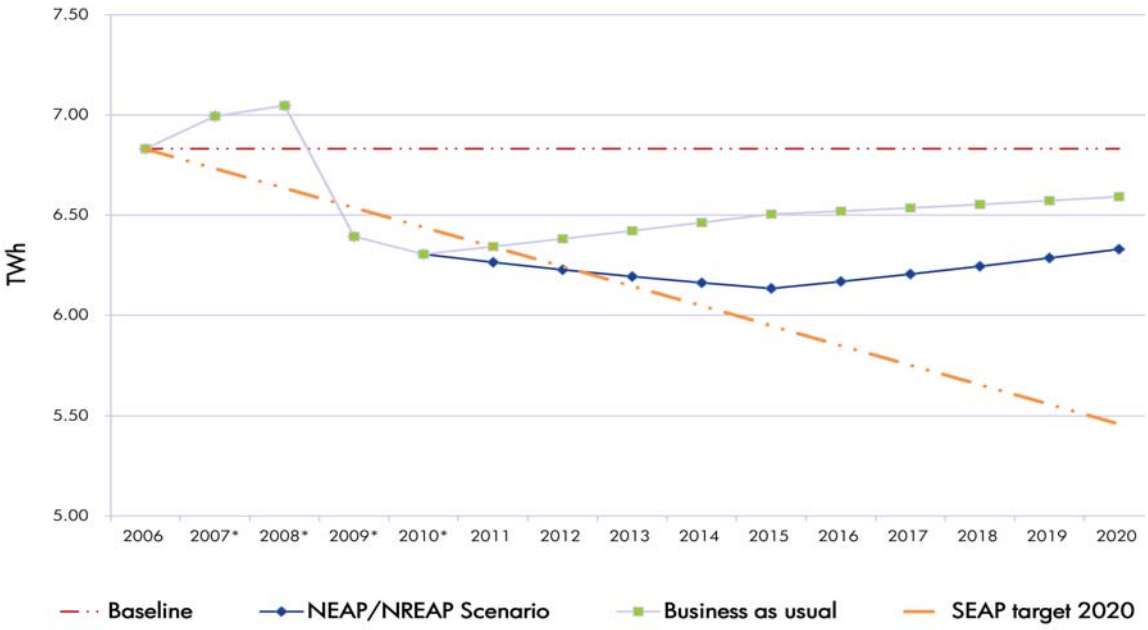
Figure 5.2: Projected CO_2 emissions for South Dublin County in Megatonne/CO_2/yr based on the NEEAP/ NREAP scenario



5.3 Comparing Scenarios to address the Challenge

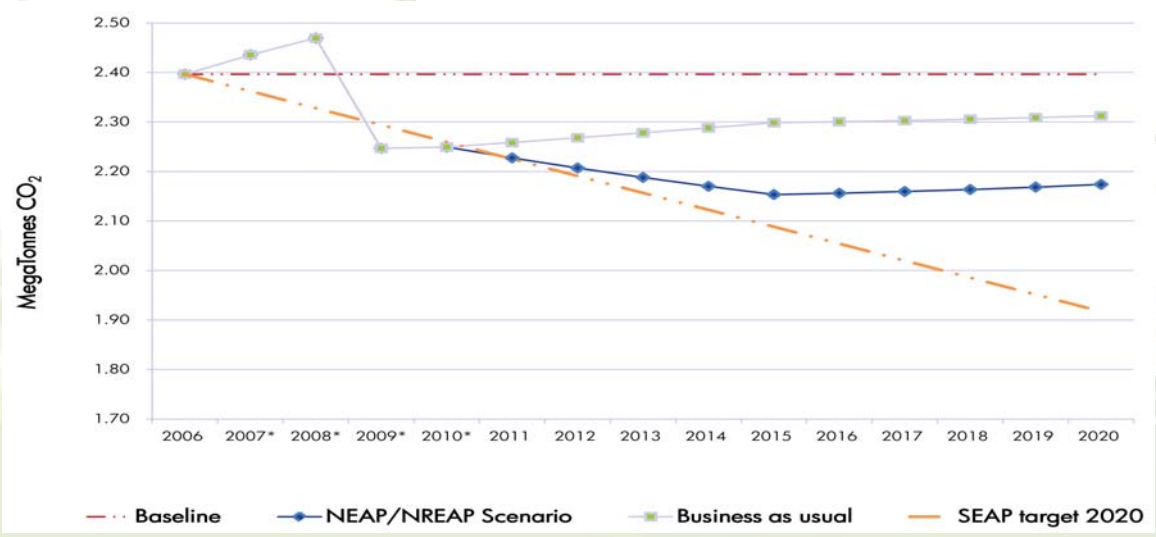
As detailed in Chapter 2, overall targets for South Dublin County to 2020, are aligned to national and European targets. According to the NEEAP / NREAP scenario projections, there will be a shortfall in South Dublin County energy efficiency target by 13% and the CO_2 reduction target by 11%, as shown in Figures 5.3 and 5.4.

Figure 5.3: Comparing energy consumption projection scenarios to 2020 in TWh for South Dublin County



The red dashed line represents a constant baseline of 6.83 TWh; this is a scenario whereby energy use is 'frozen' from the baseline year of 2006. The orange dashed line represents the SEAP target of 5.46 TWh by 2020, thus the difference between this and the baseline, is the 20% target. The purple and green line is 'business as usual', using the SEAI 'baseline' projections, this represents a scenario where no national actions are applied to South Dublin County's energy use, a 'do nothing' scenario and results in a 17% deficit from the 2020 target. The NEAP/NREAP scenario is represented by the blue line and results in a 13% deficit from the 2020 target. Figure 5.4 expresses the same scenarios as Figure 5.3, but is expressed in CO_2 megatonnes.

Figure 5.4: Comparing CO_2 projection scenarios to 2020 in Megatonnes for South Dublin County



5.4 Sectoral Targets

When SEAI's NEEAP/NREAP scenario is applied to South Dublin County's energy baseline, there is a shortfall toward 2020 targets across all sectors, as shown in Table 5.2.

Table 5.2: Sectoral and overall projections and shortfalls to 2020

Total Final Consumption TWh based on SEAP Targets				Projected 2020 savings based on NEEAP/ NREAP		
Sector	Year: 2006	Target 2020 (%)	Target 2020	Year: 2020	Savings shortfall in 2020	Savings shortfall in 2020 (%)
Residential	1.72	20%	1.05	1.12	0.07	5%
Commercial	2.48	20%	1.98	2.13	0.15	6%
Services *Industrial* *Community*	*0.70* *1.59* *0.19*	*20%* *20%* *20%*	*0.56* *1.27* *0.15*	*0.57* *1.41* *0.15*	*0.01* *0.14* *0.00*	*1%* *9%* *1%*
Transport	2.99	20%	2.39	3.04	0.64	22%
South Dublin County Council	0.05	33%	0.03	0.038	0.64	14%
Total	6.83	20%	5.46	6.33	0.87	13%

The shortfalls vary from sector to sector and because of the different contributions each sector make towards energy consumption, the amount of savings per sector in terms of energy also vary.

By examining the projections per sector, a better overview of where SEAP actions are needed can be identified. Transport is a sector that not only contributes the most to the overall baseline, but also has the largest shortfall in terms of the 2020 targets. The commercial sector has an overall shortfall of 6%, but when the sector is broken into its different categories, it can be seen that industry contributes to most of this shortfall. The residential sector has a shortfall of 5%; South Dublin County Council itself has a shortfall of 14%, but this is because of its more challenging 2020 savings target of 33%.

5.5 The South Dublin Response

For South Dublin County to address 2020 energy targets there needs to be a combination of, increasing take up of existing actions and a range of new locally based actions. These actions fall into two categories, those actions that South Dublin County Council have influence on and control over and those which are in the private sector and so, primarily come under the remit of the NEEAP/NREAP and other national policies. The savings shortfall to be achieved across the different Baseline Emission Inventory sectors is shown in Table 5.3, expressed as both kilowatt hours (KWh) and percentage savings shortfall.

Table 5.3: KWh and Percentage shortfalls required per BEI sector

Sector	Savings shortfall in 2020 (kWh)	Savings shortfall in 2020 (%)
Residential	70,806,076	5%
Commercial	148,243,689	6%
Services *Industrial* *Community*	8,139,995 137,945,750 2,157,945	1% 9% 1%
Transport	644,753,849	22%
South Dublin County Council	6,654,168	14%
Total	0.87 TWh	13%

Having regard to the methodology undertaken in preparation of the Baseline Emissions Inventory 2006, the South Dublin response has been to focus SEAP actions under the similar theme areas of:

- Institutional / Commercial Actions (which includes South Dublin County Council (Municipal) Actions
- Residential / Community Actions
- Land Use Planning / Transport Actions

Institutional / Commercial Actions

South Dublin County Council will reduce it's own baseline energy consumption through improved efficiencies in energy use and an increase in the use of energy from renewable sources, including energy produced within the County.

South Dublin County Council will work with key local stakeholders such as Tallaght Hospital, Institute of Technology Tallaght, The Square Shopping Centre, primary and secondary schools and the local business community, to reduce energy usage in the County through training and information dissemination and the development of larger community based energy efficiency projects.

The commercial sector, for the purposes of projections, is divided into a number of categories. As has been seen in the sectoral breakdown in Table 5.4, the industrial category has the largest shortfall. Nevertheless, SEAP actions should be devised to achieve savings across all categories.

South Dublin County has a variety of employment types and there are an estimated 6,300 businesses in the County. Approximately 39 industrial estates and 46 business parks account for 2,200 firms; large employment centres are located in 16 large industrial estates and 2 international business parks at Grange Castle and Citywest. There is also significant retail, office and service based employment in South Dublin County.

Whilst it is acknowledged that SDCC's influence over this sector is limited, the Council, by developing networks with key stakeholders in the commercial sector across South Dublin County, can assist in the development of locally based actions that can assist businesses in reducing energy consumption and costs and ultimately become more competitive. It is anticipated that locally based SEAP actions in this area, have the potential to be replicated across the County with the support of South Dublin County Council.

Residential / Community

The residential sector shows a relatively small 5% or 0.07 TWh shortfall by 2020, in part due to already identified increases in future building regulations and slow down of the construction sector. As such, SEAP actions should concentrate on improving the existing residential stock and changing domestic energy behaviour. There are already national programs targeting energy efficiency retrofit in the residential sector through grants and promotional programs. South Dublin County Council has also contributed towards this by the roll out of schemes such as the upgrading and refurbishment of its own housing stock and participation in SEAI's 'Warmer Homes Scheme', involving the upgrading of housing stock in both the public and private sector. In the longer term, other actions such as a 'national pay as you save scheme' have been identified to accelerate the rate of retrofit in Ireland.

Table 5.4 shows the number of residential houses that would have to be upgraded to a BER C1 standard in order to meet the 0.07 TWh shortfall.

Table 5.4 Increased retro-fit to BER C1 standard to meet 2020 shortfall in the residential sector

Sector Shortfall kWh	kWh needed per house to C1 standard	No. of Houses needed to C1 standard
70,806,076	5,033	14,068

Land Use Planning / Transport

Energy projection calculations reveal that the transport sector has the largest deficiency in meeting 2020 targets. This is a sector that South Dublin County Council has least influence over, in terms of the delivery of large scale public transport infrastructure and improvements to efficiencies in the various transport modes. Nevertheless, SDCC has been an exemplar in recent years in integrating land use and transport planning, in particular developing Planning Schemes for two public transport based Strategic Development Zones (SDZ) at Adamstown (www.adamstown.ie) and Clonburris (www.clonburris.ie). In the area of sustainable business, SDCC is developing an economic development strategy for the County, a focus of which is to maximise business opportunities around existing public transport infrastructure.

In Ireland, the Department of Transport, Tourism & Sport has overarching responsibility for promoting sustainable travel patterns. The Department's Smarter Travel policy 'Smarter Travel – A Sustainable Transport Future 2009-2020' sets out goals and targets to address Irelands unsustainable travel patterns by 2020 and includes a range of smarter travel actions that are currently being implemented.

South Dublin County Council is committed to developing sustainable communities based on the integration of land use and transport planning and to delivering a package of Smarter Travel and other measures to encourage a modal shift from private car to more sustainable modes for all journeys. This ambition aims to ultimately support a new mobility and emissions reductions culture among citizens of South Dublin County. South Dublin County Council recognises that barriers to sustainable travel in South Dublin County are both physical and behavioural and that a modal shift to more sustainable modes can only be achieved through combining both physical interventions with behavioural change initiatives.

UK based research has shown that a combination of Smarter Travel initiatives have potential to reduce private car trips between 7% to 9%. The continuation and replication of SEAP actions have the potential to significantly reduce energy consumption and CO_2 emissions in the transport sector across South Dublin County.

Table 5.5 shows the requirements in relation to KWh and distance reductions by private vehicles in order to reach 2020 targets for the transport sector.

Table 5.5: Transport shortfall per vehicle type in kWh and the number of km of private vehicles to be reduced by 2020

Vehicle Type	Sector Shortfall kWh	kWh per km travelled	No. of km trips to be reduced
Car/Van (LDV)	386,852,309	226	1,714,152
HGV	257,901,539	1,002	257,420

CHAPTER 6: SEAP ACTIONS

6.1 Introduction

The preparation of this, the first South Dublin Sustainable Energy Action Plan, marks the culmination of efforts in addressing the energy challenge, from County to local level. Having established a 2006 baseline emissions inventory, identified energy targets to 2020 and recognised the shortfalls the County faces in reaching these targets, the SDCC response has been to identify a range of energy actions, structured under the SEAP principles of 'Record, Reduce and Replace'. The Council acknowledges that certain areas of energy action have been in operation for some time and others have just recently been established. In compiling a range of actions across sectors, involving a number of Council departments and other stakeholders, it is apparent that for individual SEAP actions, in particular those in the process of being developed, quantifying CO_2 emissions reduction and energy consumption savings, will require time. As such, as part of the SEAP monitoring process, the impact of individual actions on energy efficiency and CO_2 emissions, will be analysed and reported on. Reviews of the South Dublin SEAP in the future will provide updated information on efficiency savings and CO_2 savings resulting from individual action implementation. SDCC recognises that certain action areas complement each other and as such the general cumulative benefit of SEAP actions to CO_2 emissions reduction and energy consumption savings, can also be measured.

SEAP actions are structured under the headings of 'Record, Reduce and Replace'. Each action is given a reference number; the Council department(s) responsible for implementing each action, funding sources identified and SEAP theme area for which each action relates, are also identified. More detailed information on a number of SDCC exemplar/benchmark projects is contained in Appendix C.

6.2 RECORD Actions

To achieve energy targets, whether at a County or local level, recording energy information is a necessary first step. SEAP 'Record' actions promote an evidence based approach to energy management and focus on streamlining the compilation of energy data and indicators across sectors, to encourage the development of energy modelling and mapping, to provide robust data for the identification of specific energy measures / technologies and facilitate preparation of studies by wider stakeholders.

Action Ref: REC1	Recording and measuring SDCC large energy users in building stock, public lighting, fleet, drainage and water management
To be implemented by	Architectural Services Department, Environmental Services Department, Roads & Water Services Department, Development, Economic & Transport Planning Department, Corporate Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Municipal

SDCC will improve efficiencies through understanding existing patterns of energy use. This can be done by firstly measuring energy use in SDCC building stock, public lighting, fleet, drainage and water management, to provide energy use baseline figures.

Tallaght Leisure Centre

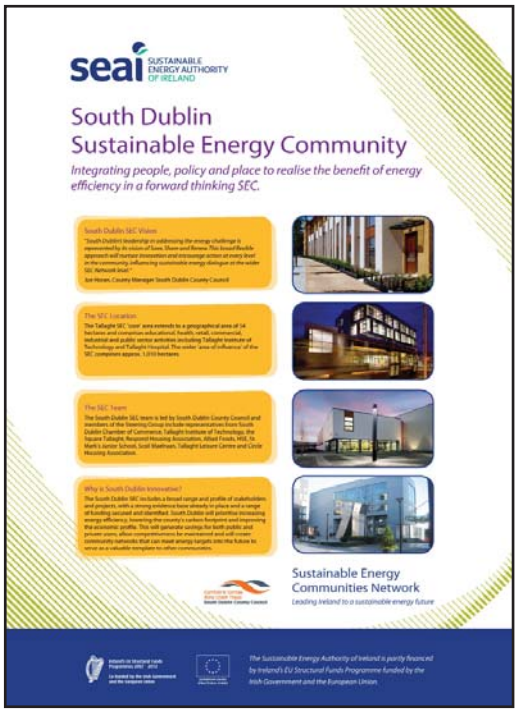
South Dublin County Council has identified its largest energy users and is creating a database of energy use for these users, which can be reviewed on a monthly basis against energy performance indicators. This database of energy use will be used to improve energy efficiencies and provide a platform for accurate reporting and feedback. The business case for investing in energy upgrades and improving efficiencies can be developed and implemented.

Action Ref: REC2	Identifying Energy Performance Indicators
To be implemented by	Architectural Services Department, Development, Economic & Transport Planning Department, Environmental Services Department, Roads & Water Services Department, Community Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Municipal, Institutional, Commercial, Residential, Community, Land Use Planning, Transport

South Dublin County Council will identify Energy Performance Indicators to measure improvements and awareness, relating an energy use baseline to a specific activity. Examples of Energy Performance Indicators are population, electricity use per employee, gas use per degree day.

SDCC will roll out the installation of real time energy use metering to measure the reduction in energy use as a result of these actions, which will assist in reporting on their effectiveness. South Dublin County Council will use this feedback to inform the local community on the real benefit of these technologies.

Action Ref: REC3	Using Sustainable Energy Community (SEC) network to evaluate performance of and share knowledge gained through energy efficiency projects
To be implemented by	Architectural Services Department, Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government, SEAI
Theme Area	Municipal, Institutional, Commercial, Residential, Community.



South Dublin Sustainable Energy Community Poster

South Dublin County Council will use the Sustainable Energy Community network to disseminate knowledge gained from energy efficiency and pilot projects. SDCC will develop a link with third-level institutions, local and regional, to analyse effectiveness of pilot projects and to provide accurate feedback on actual energy savings linked to financial investment strategies. This will also include a network of schools and community centres.

Action Ref: REC4	Develop a Heat Mapping Tool to geographically represent energy data for buildings across all sectors
To be implemented by	Spatial Data Unit, Development, Economic & Transport Planning Department, Architectural Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Municipal, Institutional, Commercial, Residential, Community, Land Use Planning, Transport

An accurate energy use map was developed for Tallaght (the county town), using surveys, national and regional energy data. As a preliminary method of extending this over the County, it is intended to map large residential estates / districts using Building Energy Rating (BER) certificates prepared by SDCC (almost 1600 to date) and gather similar data from property websites and further information made available by the Sustainable Energy Authority of Ireland (SEAI). An energy use map of the County will be prepared in this way and detail will be added over the period of this SEAP to refine and perfect the data included.

Action Ref: REC5	Collection & Analysis of Building Energy Rating (BER) Data
To be implemented by	Architectural Services Department, Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Residential, Community

South Dublin County Council has approximately 9,010 dwellings in its housing stock. Thousands of these houses have been upgraded through specific refurbishment and energy improvement projects funded by the

Local Authority and the Department of the Environment, Community and Local Government, starting with simple cavity wall and attic insulation in the 1990's and progressing to the full range of energy upgrade works in the current Refurbishment Programme in line with increased standards under the Building Regulations.

Since 2010 as part of this range of works, SDCC has collated BER data which has been taken from 1742 council owned dwellings. This can be utilised to compare energy performance of residential dwellings before and after refurbishment / upgrade facilitating the calculation of viable payback periods and appropriate financial investment levels. It is intended to develop this tool to promote the residential energy opportunities for both the public and private sector, across the County.

6.3 REDUCE Actions

For all stakeholders across all sectors, there is a need to reduce energy demand, costs and CO_2 emissions and increase energy efficiency and awareness. South Dublin County Council has gained significant experience in these areas over recent years, ranging from piloting energy efficiency/refurbishment projects, developing citizen campaigns and integrating land use and transport planning to create sustainable communities. The opportunity now exists for this experience to be folded out across all sectors through a range of SEAP 'Reduce' actions.

Action Ref: RED1	Continue engagement with Energy MAP Programme and prepare an Energy Efficiency Action Plan for SDCC, identifying efficiency measures for large energy users in building stock, public lighting, fleet, drainage and water management
To be implemented by	Architectural Services Department, Development, Economic & Transport Planning Department, Environmental Services Department, Roads & Water Services Department, Corporate Services Department, Community Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Municipal

South Dublin County Council has established an Energy Action Team consisting of multi-disciplinary staff, representing the main energy users in SDCC. The team has been trained in the principles of energy management and action planning. The Energy Action Team at SDCC meet monthly to assess the effectiveness and progress of energy efficiency measures and improvements across all Council functions and facilities. The meetings are a platform to review progress of pilot projects and awareness campaigns. This continuous assessment of the Energy Efficiency Action Plan will help to address anomalies in energy use as they occur, rather than waiting until an end of year review. This will ensure that the Council is constantly reviewing energy use on a monthly basis which is key to keeping energy reduction measures on track. Larger issues of energy in the Council will be tracked to evaluate their monthly readings.

Action Ref: RED2	Improving efficiencies through South Dublin County Council Energy Awareness campaigns for staff and politicians
To be implemented by	Development, Economic & Transport Planning Department, Environmental Services Department, Architectural Services Department, Corporate Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Municipal

"Connect with Energy" Poster Displays, June 2012

SDCC aims to improve energy efficiency and build on experiences gained from the EU IEE funded LEAP programme, through continued energy awareness campaigns for approximately 1,650 Council staff and all politicians. By continuing institutionalisation of the LEAP programme and SDCC's commitment to energy efficiency at senior management level, campaigns can be focused at Department level, in conjunction with wider energy campaigns throughout the year.

Action Ref: RED3	Awareness Raising & Local Networking
To be implemented by	Development, Economic & Transport Planning Department, Environmental Services Department, Corporate Services Department, Community Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Residential, Community, Institutional, Commercial, Land Use Planning, Transport

Schools Workshop at "Connect with Energy" event, June 2012, attended by Mayor Caitriona Jones

South Dublin County Council carries out a number of environmental awareness programmes throughout the year, including week long events (for example Eco-Week), workshops, schools initiatives and outreach programmes. SDCC intends to continue on the success of its 'Connect with Energy' week long initiative by integrating energy awareness raising and networking initiatives, with the wider SDCC environmental awareness programme. There are also further opportunities to work with schools and community groups through newsletters, workshops, library events and outreach programmes. Further information on SDCC's 'Connect with Energy' initiative, carried out in June 2012, is available at www.southdublinenergy.ie

Action Ref: RED4	Continuing refurbishment of housing stock across South Dublin County through involvement in schemes such as the 'Warmer Homes Pilot Project'
To be implemented by	Architectural Services Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government, SEAI
Theme Area	Residential, Community

Since it's formation in 1994, South Dublin County Council has been committed to the continued energy upgrade and refurbishment of its housing stock. The 'Community Enterprise Cavity Wall and Attic Insulation Programme' upgraded 4,860 houses up to 2007. The Window Replacement Programmes have changed single glazed windows to double glazed in 1,200 dwellings since 2006. The 'Accelerated gas fired central heating Programme' installed 2,715 new central heating systems between 2006 and 2009. All these programmes brought the older pre 1990 housing stock, up to a comfortable living standard.

In addition to these programmes, the extensive SDCC Refurbishment Works Programme which has been rolled out in phases since 2000 will have fully upgraded 983 houses by the end of 2013. As part of this programme, Cushlawn Phase 3 which started on site in May 2011 and reached substantial completion in December 2011 upgraded 75 dwellings. The works carried out included wall and attic insulation, a full electrical and heating system upgrade, replacement windows and doors, draught-proofing and airtightness works and miscellaneous repairs internally and externally. Before and after BER ratings were evaluated. Before the works were carried out 75% had a BER of D1 or less. After the works were complete 73% had achieved a BER of B3 and 24% had achieved a BER of B2. This represents an average of 37% reduction in energy consumption which represents a significant improvement in these older dwellings and has a direct benefit to tenants in relation to their energy costs and an improved quality of life.

SDCC upgraded the cavity wall and attic insulation in 177 vacated dwellings since 2010 under its Energy Efficiency Re-let Programme achieving a minimum of C1 BER rating and it is anticipated that a further 40 houses will be upgraded in 2013.

In August 2012, Sustainable Energy Authority of Ireland (SEAI) grant aided, under the 'Warmer Homes (Area-based / Low-income) Pilot Project', a pilot upgrade/refurbishment project of forty eight houses in the Brookview Estate, Tallaght. The dwellings chosen comprised a mix of Local Authority and private houses; fuel-poverty was a key determining factor. The dwellings chosen were constructed in 1972, had gas heating systems and a pre-project energy rating of E1. The works were carried out without cost to the householder, during September and October 2012. This project was carried out in collaboration with Energy Action and Retrofit Energy Ireland.

The project also facilitated access to householders energy data from both electricity and gas suppliers, to monitor changes in energy consumption following project completion. It is intended to develop an energy awareness campaign with householders to encourage behavioural change and reduce energy costs. SDCC intends to continue working with energy partners to seek funding opportunities to replicate this, or similar initiatives across the County.

South Dublin County Council will continue to refurbish the housing stock through Department of Environment sponsored refurbishment programmes, grants from Department of Environment for energy upgrade relets, SEAI sponsored 'Warmer Homes' schemes and the SDCC funded window replacement programmes.

Action Ref: RED5	Continuing energy upgrade of other SDCC owned and operated building stock
To be implemented by	Architectural Services Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government
Theme Area	Municipal

SDCC will continue to upgrade it's building stock, to become more energy efficient with the roll out of projects such as the 'Green Depots', which will combine the installation of improved controls for lighting and heating and ongoing fabric upgrades to provide added thermal mass and energy efficiency in these buildings.

Action Ref: RED6	Continuing energy upgrade of public lighting and develop pilot projects in this area
To be implemented by	Roads & Water Services Department, Public Lighting, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government
Theme Area	Municipal

Public lighting accounts for over half of SDCC energy usage with up to 35,000 public lights. Overall strategies relate to replacement programmes with more efficient lights and LED technology and the linking of telemetry and dimming technology.

SDCC use a Central Management System which allows remote monitoring and control of "Smart" installations. Most usefully, it allows variable lighting control. Even where street lights are not dimmed during low traffic use, this technology garners a minimum 18% reduction due to the curtailing of light output to prevent 'overlighting' due to the maintenance factor. Where traffic profiles allow, it is also possible to dim the street lights to the next lighting class asset out by BS-EN5489.

SDCC will continue to roll out its dimmable technology to reduce energy consumption during low traffic periods. This technology also allows SDCC to avoid energy wastage through 'overlighting' when designing for lamp depreciation. A reduced burn hour plan is currently being implemented with low light switching photocells now installed as standard.

Springfield Avenue was identified for a pilot project in public lighting as it allowed SDCC to illustrate the full potential of a cohesive, effective redesign on energy consumption. The high wattage, inefficient lanterns, combined with the end of life state of wiring and columns, and the request of residents for an improvement in lighting levels, made Springfield Avenue an ideal candidate to showcase the energy efficient initiatives currently being implemented by SDCC across its public lighting stock.

The main design aim of the project was to improve the lighting levels to an appropriate level for current traffic use while achieving a 30% energy reduction. It was also important to improve the amenity lighting along the Dodder River, increasing the security of night-time users. In order to garner some payback from the capital investment of the structural budget, it was decided to install metered electricity supply points.

The design process involved specification of efficient lanterns based on extensive modelling and calculations of lantern performance with in-house software. This was followed by a detailed model of the road to take account of obstructions, junctions and various changes to footpath, cycleway and parking configurations. By utilising the technology outlined below, the stated aim of reducing the annual energy consumption by 30% was exceeded by a large margin. The final reduction of the new system was 55% on the previous installation, equating to a saving of 27,245 kWh a year.

An LED Retro Fit Pilot Project is currently underway in conjunction with the Greater Dublin local authorities to investigate the feasibility of wholesale replacement of high energy Low Sodium lanterns. An associated business plan will follow with support from CODEMA to source funding.

A low energy photocell replacement has been added to all maintenance actions and should result in a reduction of 60 burn hours per year per lamp. It is estimated that all lanterns shall be upgraded with minimal cost uplift within a three year period.

Action Ref: RED7	Continuing energy upgrade of drainage and water distribution network and develop pilot projects in this area
To be implemented by	Environmental Services Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government
Theme Area	Municipal

Large amounts of energy are used in stations pumping water mains and surface and foul sewers. Use of variable speed-pumps allied to smart control and telemetry systems will be tested and used on these pumping facilities.

SDCC proposes to trial an energy saving control strategy at Esker Lodge Drainage Pump Station. This modifies the existing automatic pump control from switching the pumps on a maximum speed when required, to varying the flow in accordance with the inflow conditions. It is estimated that close to one month of free electricity could be saved if this trial proves successful.
SDCC is also developing pilot projects in this area, including the following:

- A trial of a hydro-electric turbine generator in Finnstown district metred area commenced in December 2011. This turbine uses the hydraulic energy of water flowing in the watermain to power the outstation (a pressure reducing valve is required) and can supply 14w continuously.

- A trial of a solar system in Hibernian Industrial Estate is ongoing and has been live from February 2012.

Action Ref: RED8	Improvements in fuel efficiency in fleet and develop pilot projects in this area
To be implemented by	Environmental Services Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government
Theme Area	Municipal, Institutional, Commercial

South Dublin County Council Fleet

In the last decades, engine technology and performance of vehicles has improved rapidly, while most drivers have not adapted their driving style. Eco-driving represents a driving culture suited to modern engines and makes best use of advanced vehicle technologies. Eco-driving offers numerous benefits, including CO_2 emissions reductions, fuel cost savings, as well as greater safety and comfort. For businesses, eco-driving can result in 5 – 10% fuel savings.

SDCC has recently installed GPS across its entire fleet of vehicles. This enables management to measure the parameters (e.g. distance, vehicle idling, speeding), that contribute towards high fuel consumption, and to put in place corrective measures in order to reduce the Council's annual fuel spend. Savings can be made through training of fleet-drivers in eco-driving techniques. The efficient use of the fleet through careful planning and journeys linked to programming of operators and locations is central to overall efficiency.

Action Ref: RED9	SME Energy Initiative
To be implemented by	South Dublin Chamber of Commerce, Architectural Services Department, Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	South Dublin County Council, South Dublin Chamber of Commerce, private funding sources, national funding, EU funding
Theme Area	Institutional, Commercial

South Dublin County Council, in conjunction with South Dublin Chamber of Commerce has commenced an energy initiative aimed at Small & Medium Enterprises (SMEs). The aim of this programme is to assist SMEs in understanding their energy costs and to assist them in identifying ways to become more energy efficient and reduce energy bills.

To commence the initiative, a pilot programme focusing on five Tallaght based business was carried out during 2011 / 2012. The businesses involved in the pilot included:

- Burgmann Packaging
- Tallaght Law
- The Maldron Hotel
- Miele Packaging
- South Dublin Chamber of Commerce

The in-house training provided by SDCC and South Dublin Chamber of Commerce staff focused on the following energy areas:

- Understanding energy bills
- Visual Audit
- Energy Supplier Options
- Identifying energy saving opportunities

Energy saving opportunities identified included the following:

- Low cost measures such as switch off policies and maximising daylight
- Lighting maintenance
- Time controls for lighting
- Daylight sensors
- Occupancy sensors
- Temperature controls
- Energy investments such as heat recovery or variable speed drives

Saving opportunities were identified as no cost, low cost and investment, with periods for return on investment also calculated. The value of savings was also identified allowing businesses to understand the real monetary value of considering energy savings. Potential annual energy cost savings of up to 10% were identified from opportunities identified during the pilot project training programme. By 2020, significant savings can be made by engaging between 10% - 20% of South Dublin businesses in similar programmes.

Action Ref: RED10	Develop Business Energy Networks
To be implemented by	South Dublin Chamber of Commerce, Architectural Services Department, Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	South Dublin County Council, South Dublin Chamber of Commerce, private funding sources, national funding, EU funding
Theme Area	Institutional, Commercial

South Dublin County Council, in conjunction with the South Dublin Chamber of Commerce and other stakeholders, aims to engage large business parks / industrial parks in the County, to set up Business Energy Networks. These locally based networks endeavour to encourage businesses to work together to share knowledge and best practice, to collectively reduce energy consumption and energy costs. There is also an opportunity for this initiative to investigate the development of local district heating systems, based for example, on an Energy Service Company (ESCO) model.

Action Ref: RED11	Schools Energy Initiative
To be implemented by	Development, Economic & Transport Planning Department, Environmental Services Department, SDCC
Funding Sources identified	South Dublin County Council, SEAI
Theme Area	Institutional

SDCC are in the process of identifying the Green Flag status of all one hundred primary schools and thirty five secondary schools located in the County, with particular focus on the second Green Fag which is related to 'energy'. Barriers will be identified in the process and solutions will be identified to overcome these.

In conjunction with SDCC's Environmental Services Department and SEAI, a series of energy themed workshops will be undertaken with pupils to address the behavioural side of energy in schools and tap into the potential 'home impact multiplier effect', whereby the benefits of what children learn in schools has far reaching benefits in the wider community.

The SDCC energy website and other social media will be fully utilised to link with schools and provide meaningful dialogue with school principals and staff on the range of services available to schools. This includes highlighting the services offered by SEAI including their new 'Energy in Education' Programme.

Action Ref: RED12	Continue the development of sustainable communities policy based on the integration of land use and transport planning
To be implemented by	Development, Economic & Transport Planning Department, Architectural Services Department, Road & Water Services Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Land Use Planning, Transport

South Dublin County Council has a proven track record in integrating land use and transport planning to develop sustainable communities, whereby places to live, work and avail of local amenities are developed in conjunction with the delivery of frequent and reliable public transport. SDCC previously carried out the Tallaght Integrated Area Plan 1999 – 2008 to address the physical, social and environmental regeneration of Tallaght town centre and its environs. The expertise of South Dublin County Council in the development of sustainable communities has culminated in the preparation of Strategic Development Zone (SDZ) Planning Schemes for two new emerging communities, at Adamstown and Clonburris. The Council recognises that a reduction in CO_2 emissions from the transport sector is dependant on the continuing development and delivery of sustainable communities in tandem with public transport improvements, across the County.

Adamstown SDZ, southern end Aerial Photo.

The Adamstown SDZ Planning Scheme was approved in 2003 and provides the framework for an urban development of 10,000 residential units, up to 125,000 square metres of non-residential development including community, shopping, leisure and employment uses, together with a new transport interchange, water and drainage infrastructure, five schools and four major parks, all on a phased basis. To date approximately 3,249 no. dwellings have been permitted on site, with 1,225 no. occupied, the remainder are currently under construction. Other key deliverables to date include: Rail Station, 2 no. primary schools, 1 no. secondary school, 4 unit local centre and 1 no. crèche. Further information on Adamstown is available at www.adamstown.ie. A ten year review of the scheme will commence in 2013.

The Clonburris SDZ Planning Scheme (approved in 2008) sets out a strategy to facilitate the development of a new, sustainable urban 'eco-district' at Clonburris, including 8 new neighbourhoods accommodating between 11,000 and 16,000 new homes, 53,000 square metres of retail space, community, leisure, schools, parks and employment uses, focused on two new railway stations on the Dublin-Kildare suburban line and a proposed metro line. The new district will be a mixed-use urban area with a range of supporting infrastructure and facilities to be developed, following the same model of planned and phased development that has been implemented under the direction of South Dublin County Council at Adamstown. Construction at Clonburris has not commenced to date.

A sustainability toolkit was developed as a user friendly resource to guide the sustainable design of the new district and address the key sustainability objectives of the Clonburris plan. The sustainability indicators were derived from a combination of best practice standards in Ireland and Europe. Further information on Clonburris is available at www.clonburris.ie. The scheme is likely to be revised before significant development commences, to respond to economic circumstances.

Action Ref: RED13	Personalised Travel Planning projects in South Dublin County
To be implemented by	Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	National Transport Authority (NTA)
Theme Area	Land Use Planning, Transport

To date, South Dublin County Council has undertaken two Personalised Travel Planning (PTP) projects, at Adamstown and more recently at Lucan / Clondalkin. In 2009, South Dublin County Council, in conjunction with the National Transport Authority piloted the first community based travel plan in Adamstown - a developing urban district situated 16 kilometres west of Dublin City Centre. Eight hundred households were offered personal door-to-door advice, maps and trial bus and rail tickets. Follow up surveys completed within 6 weeks of initial engagement showed a shift in travel behavior within this period, with significant numbers switching to walking or using the bus. 59% of respondents reported increased use of sustainable modes. 35% of participants intended to continue using sustainable modes on a regular basis while 19% intended to continue on an occasional basis. 33% reported a reduction in car usage during the pilot period.

During 2012, South Dublin County Council undertook a Personalised Travel Planning programme in the Lucan / Clondalkin area. A total of 1,657 households were successfully engaged between June 5th and August 22nd 2012 by door-to-door Travel Smart Advisors. Public transport tickets were offered to householders if the main mode of travel was by car, and information and advice was given regarding alternative travel options. If the participant was already a public transport user for work travel, participants were encouraged to consider alternatives for travel outside work - shopping, leisure, etc. Key findings of the programme included the following:

- Modal shift to walking in household, local centre and school surveys;
- Modal shift from car in local centre, school and vehicle surveys;
- Modal shift to bus from Dublin Bus data; and
- Local centre surveys revealed a willingness to consider cycling as an alternative.

Traffic counts undertaken at thirteen sites following engagement, showed approximately 2.6% reduction in average vehicle flows overall.

The engagement phase of the Lucan / Clondalkin PTP also included a primary schools engagement programme which was carried out between March - June 2012 and October 2012.

The objectives of the School engagement were:

- To establish the current numbers of pupils travelling to school by walking, cycling, car and public transport;
- To raise awareness and inform pupils and families of the benefits of walking, cycling or public transport for travel to school for the students, school and community as a whole; and
- To support the schools in reducing the numbers of pupils travelling to school by car through assisting in introducing 'Once a Week' events such as Walk on Wednesdays, providing cycle parking where required and other resources such as hi-vis jackets and rewards/incentives.

A series of twenty five community events were also carried out between April and September 2012. Events ranged from larger family events to smaller events with individual groups. All events included a sustainable transport theme - to promote walking, cycling, bus or train use. Details of the event were circulated to all households via a newsletter and were available on the website www.travelsmartcommunities.ie. A variety of community groups in the study area across a range of age and demographic profiles were also targeted; these included the over 55's/active age groups, teen/youth groups, parent and toddler groups, unemployment groups, women's groups and traveller groups.

Within South Dublin County there is potential to identify further areas for the development of Personalised Travel Planning programmes.

Action Ref: RED14	Local Permeability Projects
To be implemented by	Development, Economic & Transport Planning Department, Environmental Services Department, Roads & Water Services Department, SDCC
Funding Sources identified	National Transport Authority (NTA)
Theme Area	Land Use Planning, Transport

South Dublin County Council, in conjunction with the National Transport Authority (NTA), is developing short walking and cycling routes to serve local communities. These routes will create more sustainable local neighbourhoods with direct pedestrian and cycle links to popular local destinations. The aim is to encourage people to leave the car at home for local trips by bringing more households within walking and cycling distance to local amenities.

In many cases the links are based on existing shortcuts, enabling cyclists and pedestrians; including those with decreased mobility, to access safe, direct, hard surfaced routes to the local shops, school, community centre, public transport stop, cycle route, or the park / playground. Increased walking and cycling within local neighbourhoods reduces carbon footprints, encourages a healthier lifestyle and an increase in the numbers of users will improve the safety of the route and discourage anti-social behaviour.

Two projects progressed to construction in 2011, since then, further projects have been approved for funding by the NTA, three were completed and a further four are at planning construction stage.

A post user survey of the completed Dargle Wood link at Knocklyon indicated that a total of 1,451 people used the route in a 23.5 hour period over 3 days (Survey carried out on Tuesday 18th September 2012 from 13:30 to 19:30, on Wednesday 19th September 2012 from 08:00 to 19:30 and on Saturday 22nd September 2012 from 11:00 to 17:00), thereby removing alternative trips by car from the local network.

Action Ref: RED15	Design Manual for Urban Roads and Streets (DMURS)
To be implemented by	Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	National Transport Authority (NTA)
Theme Area	Land Use Planning, Transport

Minister Leo Varadkar TD and Mayor Cathal King at DMURS Launch, March 2013.

A Project Team, with significant input from South Dublin County Council was established in 2010 to produce new national guidance, the Design Manual for Urban Roads and Streets (DMURS). The project team consisted of multi-disciplinary representatives of architecture, engineering, planning and urban design professions. DMURS was published by the Department of Transport, Tourism & Sport and the Department of the Environment, Community & Local Government, on the 25th March 2013.

The influence of transport choices and the design of the built environment are often overlooked. Conventional design practises often prioritise the movement of motor vehicles over other pedestrians, cyclists and other transport modes. This has resulted in a built environment that contributes to increased levels of car dependency by discouraging more sustainable alternatives, such as walking, cycling and public transport.

The Design Manual for Roads and Streets (DMURS) seeks to put well-designed streets at the heart of sustainable communities. DMURS supports boarder environmental, planning and transportation policies aimed at the creation of energy efficient urban environments by assigning higher priority to pedestrians, cyclists and public transport. DMURS seeks to achieve this through:

- integrated street networks which promote higher levels of permeability and legibility for all users, and in particular more sustainable forms of transport.

- multi-functional streets that promote a high quality pedestrian and cyclist environment, whilst balancing the needs of all users within a self-regulating/traffic calmed environment.
- greater levels of communication and co-operation between design professionals and through the promotion of the multi-disciplinary design teams.

The publication and implementation of the Design Manual for Roads and Streets can assist in CO_2 emissions reduction in the transport sector within South Dublin County

Action Ref: RED16	Cycle routes/networks in South Dublin County
To be implemented by	Development, Economic & Transport Planning Department, Roads & Water Services Department, SDC
Funding Sources identified	National Transport Authority (NTA) other national funding sources, EU funding
Theme Area	Land Use Planning, Transport

Cycle Routes in Lucan, South Dublin County

There is growing recognition that encouraging modal shift to cycling can help tackle some of the challenges to movement in urban areas by:

- Reducing CO_2 emissions and combating climate change;

- Relieving traffic congestion and thereby improving economic competitiveness and quality of life; and

- Contributing to improved health and lifestyle.

The National Cycle Policy Framework 2009-2020, a component of the Smarter Travel programme, envisages a significant shift in the period to 2020 towards cycling as a more sustainable mode of transport. In South Dublin County, cycling accounted for approximately 1% of all trip to/from, within and through the County in 2006 and only 1.4% of all internal trips.

As with public transport, significant investment has been made in cycle lanes, particularly as part of road construction programmes in recent years. To address CO_2 emissions reduction in the transport sector, it is clear that there are barriers to encouraging cycling that must be understood and addressed, beyond the provision of infrastructural measures.

There is strong potential to encourage increased Cycle Network Plans being completed by the NTA, to include several key routes in South Dublin County, encouraging increased cycling trips, especially for shorter trips of more than 1-2 kilometres and up to 6-8 kilometres in distance. This requires a holistic catchment-focused approach that can both influence behavioural change and ensure that any further investment is targeted to respond to identified infrastructural need within the local catchment context.

One example of this is the construction of a new cycle route from Tallaght to Ballyboden. The route is a 5 kilometre strategic cycle link between Tallaght and Ballyboden in South Dublin County that will link residential communities in Tallaght, Ballycullen, Firhouse, Knocklyon and Ballyboden to the wider city network, including a new cyclist / pedestrian bridge over the River Dodder.

Within South Dublin County there is potential to identify further high quality demonstration cycling routes and networks. Measures to support this action could include bicycle procurement options, measures to support public and private bicycle parking, storage facilities, signage etc.

Action Ref: RED17	Work Place Travel Plans
To be implemented by	Roads & Water Services Department, SDCC
Funding Sources identified	National Transport Authority (NTA) other national funding sources, Private Sector funding, EU funding
Theme Area	Land Use Planning, Transport

A growing number of Irish businesses are engaging in Smarter Travel, working with their employees to address their carbon footprint, employee wellbeing, access to their worksite and to reduce parking costs. Workplace travel plans have been found to reduce car use by 10–30%. This represents significant savings to an organisation, in terms of both money and time.

It is noted that in South Dublin County, Smarter Travel Workplaces programme focuses on larger businesses; there is potential to develop travel planning with smaller businesses, which would be complementary to the national programme. This is an area that SDCC intends to develop further as part of the implementation of this Sustainable Energy Action Plan.

Action Ref: RED18	Electric Vehicles
To be implemented by	Roads & Water Services Department, SDCC
Funding Sources identified	National Transport Authority (NTA) other national funding sources, Private Sector funding, EU funding
Theme Area	Land Use Planning, Transport

South Dublin County Council recognises the national target of 10% of all cars to be powered by electricity by 2020.

ESB ecars is responsible for implementing the charging infrastructure for ecars across Ireland. The system

Minister Pat Rabbitte TD and Mayor Caitriona Jones at the "Connect with Energy" launch, June 2012.

will have open accessibility for all energy supply companies and all types of ecars. Public charge points have and will continue to be introduced in public areas, alongside the initial roll out of domestic charge points in private homes across Ireland.

Within South Dublin County, there is potential to roll-out a network of public accessible charge points, in on-street locations, shopping centres, car parks etc throughout the county. Fast charging points will also be located at service stations to cater for those on longer journeys. Other emobility options for South Dublin County going forward include ecar fleets, etaxis, ecar rental and electric buses.

The Government is supporting electric vehicles through a grant support scheme, which is administered by the SEAI to assist the purchase of Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs). An accelerated capital allowance scheme is also available which permits the write-off of capital investment within one year (through SEAI).

An electric vehicle is currently being trialled by security company staff at Grange Castle Business Park. The electric vehicle is used as both a security patrol vehicle and a facilities management vehicle. The vehicle is used by a team of fifteen staff across shifts, over a twenty four hour period. The charger used to power the vehicle is a 'slow charge smart charger' and automatically collects energy use and charging data. The smart charger is also connected to the Grange Castle facilities management electric metre.

6.4 REPLACE Actions

Growth in the generation and increased use of energy from renewable sources across South Dublin County, is vital to the achievement of 2020 energy targets. SEAP 'Replace' actions set out both a strategic and local approach to exploring renewable energy alternatives in the County, facilitating capacity building across all sectors, in particular for the private sector.

Action Ref: REP1	Prepare a Local Authority Renewable Energy Strategy (LARES)
To be implemented by	Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	South Dublin County Council
Theme Area	Institutional, Commercial, Residential, Community.

Directive 2009/28/EC establishes the basis for achieving the EU's 20% renewable energy target by 2020. Ireland's National Renewable Energy Action Plan (NREAP) sets out how Ireland intends to achieve the national renewable energy (RE) target of 16% of energy demand by 2020: through 40% of electricity consumption, 10% of transport energy and 12% of heat energy being obtained from renewable sources by 2020.

Local Authorities have a very important role to play in achieving these targets. Local Authorities can further contribute towards the achievement of these targets through the preparation of robust, co-ordinated and sustainable Renewable Energy Strategies. South Dublin County Council is very much aware of the opportunity and responsibility presented by this situation.

The purpose of the Local Authority Renewable Energy Strategy will be to set out a path to allow South Dublin County to contribute to meeting renewable energy targets and set out opportunities for individuals, communities and businesses to harness renewable energy in a sustainable manner and to assist in combating climate change. The strategy will fulfil a number of objectives for South Dublin:

- It will facilitate a consistent approach to renewable energy proposals within the county
- It will inform future South Dublin County Council Development Plan by facilitating the development of specific physical planning policies and objectives in relation to renewable energy
- It will enable South Dublin County Council to provide transparent information to the public and prospective developers on the future development of renewable energy within South Dublin County.

Action Ref: REP2	Pilot renewable energy measures testing renewable technologies and improved fabric measures as part of major new build capital projects
To be implemented by	Architectural Services Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government
Theme Area	Municipal

SDCC will continue the use of new build specialist pilot projects to test renewable and sustainable energy technologies and building practices. Examples are listed below; additional detail on these projects is included in Appendix C:

Valhalla Sheltered Housing Project, Clondalkin

- A Combined Heat and Power (CHP) unit was installed as part of the new build Tallaght Leisure Centre, which was completed in 2006. When this system failed, a grant was received for a replacement combined CHP unit, which was installed in September 2012.
- The 108 sq.m solar thermal array which was installed as part of the original building project for Clondalkin Leisure Centre, completed early 2008 had failed. In October 2011 a contractor was appointed to re-commission the solar panels.
- St. Mark's Youth and Family Centre in Fettercairn underwent a refurbishment and extension to the existing centre, completed in 2009. A wood pellet boiler was installed to heat three different zones in the centre, two in the newly refurbished hall and one in the original house.

- Valhalla is a specialist new build project which will provide sheltered housing for people with different levels of physical disability. It aims to be almost zero carbon and will use photovoltaics, a heat pump and sustainably sourced materials. It will be completed and handed over to the tenants in 2013.

- Ballyroan Library, which opened to the public in February 2013, is a passive standard new build library which uses a ground source heat pump to heat the slab of the ground floor.

Action Ref: REP3	Feasibility Projects to assess large scale renewable and low carbon technologies/strategies
To be implemented by	Architectural Services Department, Development, Economic & Transport Planning Department, Environmental Services Department, SDCC
Funding Sources identified	South Dublin County Council, Department of the Environment, Community & Local Government
Theme Area	Institutional, Commercial

South Dublin County Council will continue to investigate the feasibility of using renewable and low carbon technologies on a large scale through the following:

- Desk top studies on district heating in suitable locations in the County, such as Tallaght Town Centre and Grange Castle Business Park.

- Looking at the possibility of setting up Energy Service Companies (ESCOs) in these locations.

- Desk top studies on the use of hydro based energy production on the River Dodder and River Liffey.

- Assessing the feasibility of wind energy production in public parks, in the Dublin Mountains and with LUAS (Dublin's tram system) at the Red Cow interchange.

Action Ref: REP4	Renewable Energy Feasibility Studies in conjunction with Institute of Technology Tallaght
To be implemented by	Architectural Services Department, Development, Economic & Transport Planning Department, SDCC
Funding Sources identified	South Dublin County Council, National funding sources
Theme Area	Institutional, Commercial

The Institute of Technology Tallaght is a key stakeholder in the Tallaght Sustainable Energy Community (SEC) programme.

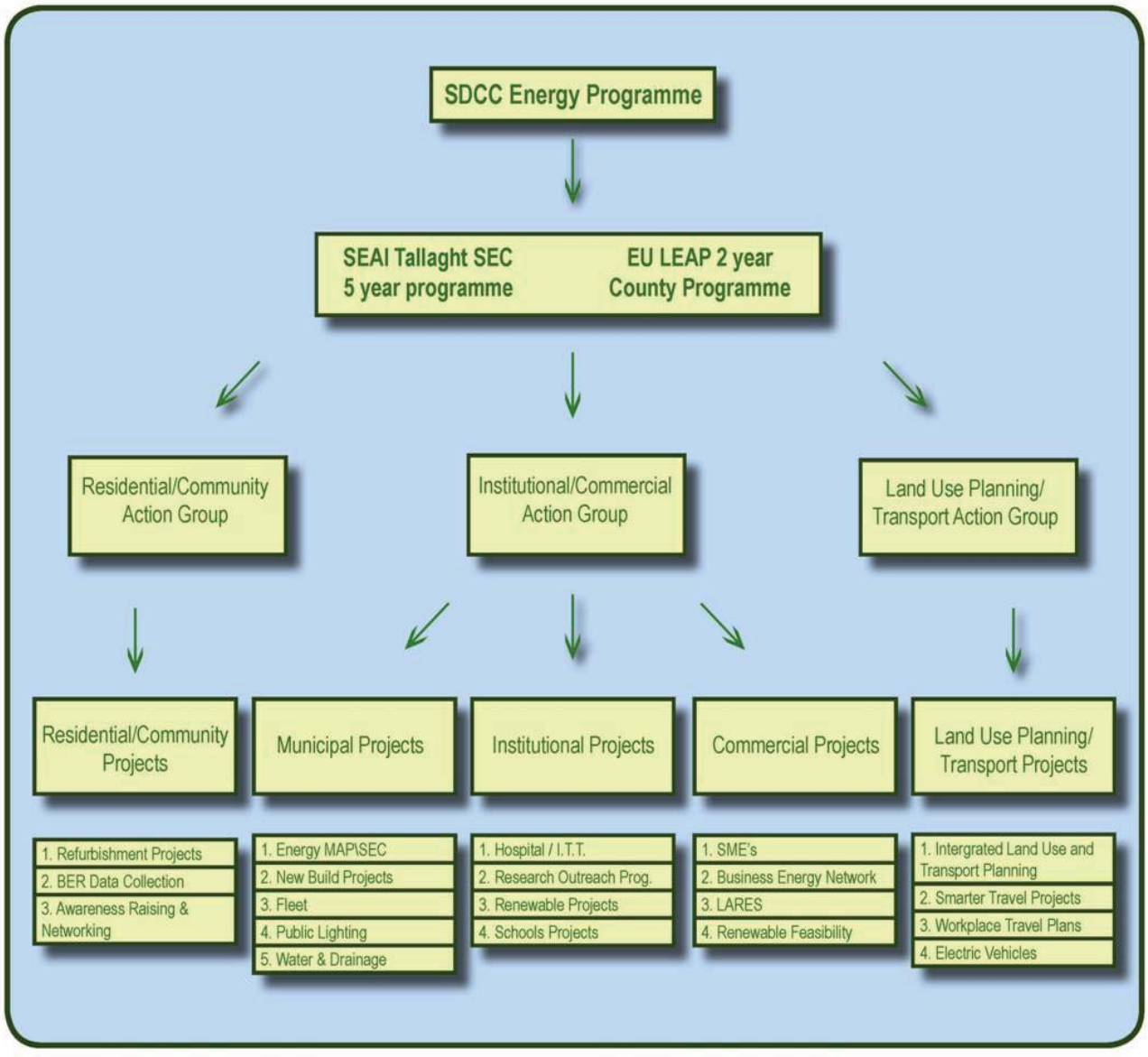
SDCC and Institute of Technology, Tallaght have identified that there is scope for a number of renewable energy feasibility studies to be undertaken by students as part of course programmes. These studies could explore on-site renewable energy alternatives that could be replicated in buildings / commercial premises across the County.

CHAPTER 7: ORGANISATIONAL FRAMEWORK, STAKEHOLDER AND CITIZEN INVOLVEMENT AND FINANCIAL ASPECTS

7.1 Organisational Framework

South Dublin County Council has set up Action Groups to facilitate the delivery of its Energy Programme, based on the following key areas: Institutional / Commercial, Residential / Community and Land Use Planning / Transport. Members of the South Dublin County Council Energy Team oversee each Action Group, to ensure consistency in the delivery of the overall programme. The SDCC Energy Programme organisation framework and associated energy projects are summarised in Figure 7.1.

Figure 7.1: SDCC Energy Programme – Organisation Framework



7.2 Stakeholder and Citizen Involvement

Involvement in the EU IEE Leadership for Energy Action and Planning (LEAP) programme has facilitated the development of stakeholder network and citizen involvement campaigns, to encourage wider involvement in SEAP development and implementation. Key components of these campaigns include the following:

Dedicated South Dublin Energy Website (www.southdublinenergy.ie) has been launched which focuses on the range of energy projects being undertaken by SDCC, as well as general news/events relevant to the Council's wider Energy Programme. The website also presents an opportunity for homeowners and businesses to access further information on energy efficiency and grants.

Public Consultation promotional film/video was produced to encourage public involvement and participation in energy awareness in the County. The video outlines key energy statistics relating to the County as well as providing an opportunity for members of the public to become involved in the SEAP development process.

'Connect with Energy Initiative' was undertaken from 11th-15th June 2012, whereby a range of suppliers of energy related goods and services hosted energy workshops and energy displays/exhibitions. The event followed a very wide communications campaign and incorporated a very successful launch event. The event provided an opportunity for SDCC to showcase energy projects currently being undertaken by SDCC, including the development of the South Dublin SEAP

School Workshops were undertaken with a number of primary school during the 'Connect with Energy' initiative and were facilitated by the Sustainable Energy Authority of Ireland (SEAI). Further workshops are planned going forward with involvement from SEAI, with particular focus on developing SDCC's involvement in 'Green Flags' programme for education facilities.

Business Engagement in conjunction with the Chamber of Commerce, a number of companies have participated in a pilot energy study identifying a range of energy improvement options ranging from low cost measures to more substantial energy investments. Business seminars were also undertaken during 'Eco Week 2012'. Further business engagement events are planned as part of Eco Week 2013, which is organised and hosted by South Dublin County Council.

Staff Newsletters (South Circular) have included details on the South Dublin SEAP development and the wider SDCC Energy Programme, to keep all 1,650 SDCC staff informed of energy projects and general energy news.

Staff Survey was undertaken at the commencement of the SEAP development process, to gauge levels of energy awareness, motivation and communication requirements amongst all staff and politicians at SDCC. A participation rate of 20% was achieved and a range of energy issues were highlighted in the areas of energy management, motivation, awareness and communication.

Green Times Schools newsletter is circulated to all schools twice a year, the September 2012 edition included details on the energy projects being undertaken by SDCC and it is the intention to undertake a competition to engage schools through further editions in Spring 2013.

Green Schools Seminar was undertaken by the Council in September 2012 to assist schools in the process of applying for Green Flags, including how to apply for/implement the energy flag. The seminar was well attended (23 schools).

Travel Smart Surveys were undertaken as part of the SDCC Smarter Travel projects, with travel advisors engaging in door-to-door interaction with 1,500 persons. In addition, schools have been engaging in 'Walk to School days' and summer advice sessions have been undertaken.

7.3 Funding Sources

There are a range of grants and funding sources available to improve the energy efficiency of homes and businesses in Ireland as well as to develop specialist new projects, research and programmes which have an energy related component. A broad summary of the key funding/grants available for energy related projects in Ireland are summarised below:

Specific SEAI Grant Schemes

SEAI 'Better Energy Homes' Scheme

The Better Energy Homes scheme provides assistance to homeowners to reduce energy use, costs and greenhouse gas emissions and improve the comfort levels within their home. To date over €115 million has been paid in grant support towards 270,000 upgrade measures in 110,000 homes nationally. Under this scheme, grants are available for a range of energy works including insulation and heating system upgrade as outlined in Table 7.1.

Table 7.1: Grants available Under the Better Homes Scheme, SEAI

Measure Type	Grant Amount
Attic Insulation	€200
Cavity Wall Insulation - All House Types	€250
Internal Wall Insulation (Dry-lining)	
Apartment (any) OR Mid-terrace house	€900
Semi-detached OR End of Terrace	€1,350
Detached House	€1,800
External Wall Insulation	
Apartment (any) OR Mid-terrace House	€1,800
Semi-detached OR End of Terrace	€2,700
Detached House	€3,600
Heating System Upgrades	
Heating Controls with Boiler (Oil or Gas) Upgrade	€560
Heating Controls Upgrade Only	€400
Solar Heating	€800
Building Energy Rating (BER)	€50

SEAI 'Better Energy Communities Programme'

The 'Better Energy Communities Programme' was set up to support and pilot innovative delivery approaches at a community level. With a fund of €3 million, the scheme is aimed at pilot projects that test new approaches to achieving high quality and efficient delivery of improvements in energy efficiency within Irish communities and pioneering partnerships for delivery between for example, the public and private sectors, domestic and non-domestic sectors, commercial and not-for-profit organisations. The scheme is open to;

- Participating Energy Suppliers
- Public sector, including local authorities
- Community-based organisations (CBOs) that have an established service for delivering the required measures; or other community type organisations.
- Private sector
- Voluntary organisations

SEAI 'Better Energy Warmer Homes Scheme'

The Better Energy Warmer Homes Scheme funds energy efficiency improvements in the homes of the elderly and vulnerable, making their homes more comfortable, healthier and cost effective to run. The scheme involves the installation of standard energy efficiency measures at no cost to the household.

Under the Warmer Homes Scheme area based pilot in 2012, the Council made a successful application for the upgrading of homes in Brookview Estate, Tallaght. The scheme provides for the upgrade/refurbishment of 48 houses, with a mix of local authority and private houses chosen. Works were completed in November 2012.

SEAI 'Better energy workplace Scheme'

The 'Better Energy Workplace Scheme' was set up to support sustainable energy investments in the public, commercial, industrial and community sectors. This fund aims to deliver a major increase in the pace, scale and depth of sustainable energy investments in upgrading existing buildings and facilities. Applications for this grant could be made up to 30th April 2012 and a decision has yet to be made as to whether the scheme will re-open in 2013. Under the scheme grant levels for the public sector were available for up to 35% of eligible funding with a similar level available for the private, voluntary and community sectors.

SEAI funding for other projects

A range of other grants have been available through SEAI for the following:

- Energy Management Action Plan (MAP) training for companies with an energy spend above €100,000.
- Electric Vehicles Grant Scheme
- Biomass CHP/Anaerobic Digestion CHP
- Sustainable Energy Incubator Programme
- Renewable Energy Research, Demonstration and Development (RERD&D) Programme
- Renewable Energy RD&D

The SEAI website is a very useful contact point for further details on such schemes www.seai.ie.

EU Funding Programmes

The European Commission administers a wide range of energy related funding programmes, which South Dublin County Council could benefit from, including the following;

IEE (Intelligent Energy Europe) – provides funding for energy efficiency and the rational use of energy (SAVE); new and renewable resources (ALTENER) and energy in transport (STEER) as well as other integrated initiatives. Each annual call for proposals under the programme set out its priority areas for funding. The indicative budget for the 2013 call is €65 million, with up to 75% of total eligible costs available under the programme.

EEEF – The European Energy Efficiency Fund (EEEF) is an innovative public-private partnership dedicated to mitigating climate change through energy efficiency measures and the use of renewable energy in the member states of the European Union. It focuses on financing energy efficiency, small-scale renewable energy, and clean urban transport projects targeting municipal, local and regional authorities and public and private entities acting on behalf of those authorities. The scheme was launched on July 1st 2011 and will run until March 2014 with a total allocation of €265 million.

FP7 (Seventh Framework Programme for Research) – In July 2012, the European Commission announced a call for proposals under its Seventh Framework Programme for Research (FP7). In total, €8.1 billion is available to support projects and ideas that will boost Europe's competitiveness and tackle issues such as improving human health, protecting the environment and finding new solutions to challenges arising, for example, from urbanisation and managing waste. Universities, research organisations and industry will be among more than 15,000 funding recipients in around 1,300 projects. Approximately €1.2 billion is available for Small & Medium Enterprises (SMEs).

Interreg – The Interreg Programme is funded through the European Regional Development fund and is an umbrella of nearly 70 individual programmes covering cross-border, trans-national and inter regional programmes. All programmes are managed separately, with some of them particularly relevant to Ireland, namely; Interreg IVA – cross border co-operation; Interreg IVB – trans-national co-operation and Interreg IVC – inter-regional co-operation. There are two priority areas in the Programme, Priority 1 includes as a sub-theme innovation, research and technological development. Priority 2 includes the following sub-themes: natural and technological risks (including climate change); water management; waste management; biodiversity and preservation of natural heritage (including air quality); energy and sustainable transport; cultural heritage and landscape.

Life + - LIFE is the European Union's financial instrument supporting environmental and nature conservation projects throughout the Union and in some candidate and neighbouring countries. The sixth LIFE + call for proposals was launched in March 2012 and includes projects on energy and climate, including energy production and distribution, renewable energy technologies, energy-efficiency in areas such as industry, services, buildings, transportation, lighting and equipment, as well as the reduction of greenhouse gases. Since the LIFE programme was launched in 1992, over 50 projects in Ireland alone have been financed under the programme.

JESSICA and JASPERS – are two initiatives developed by the European Commission, designed to support public administration and local authorities. JESSICA stands for 'Joint European Support for Sustainable Investment in City Areas' and offers assistance to public bodies to team up with partners in order to progress urban renewal and development projects. JESSICA promotes projects in the following areas: urban infrastructure, heritage or cultural sites, redevelopment of brownfield sites, Small & Medium Enterprises (SMEs), universities and energy efficiency improvements. JASPERS stands for 'Joint Assistance to Support Projects in European Regions' and provides technical expertise for any stage of a project cycle, covering technical, economic and financial questions. JASPERS targets assistance on major infrastructure projects for example, roads, rail, water, waste, energy and urban transport projects. The two programmes have a total budget fund of €11 billion.

CHAPTER 8: MONITORING AND REVIEW

8.1 Introduction

Following SEAP adoption by a local authority, continuous monitoring is needed to identify progress in action areas, impacts on energy consumption and CO_2 emissions and to allow for consistency in the SEAP implementation process. Regular monitoring following the adoption of the SEAP facilitates a continuous improvement cycle.

8.2 Covenant of Mayors Requirements

Covenant of Mayors signatories are committed to submit regular reports following the submission of the SEAP for evaluation, monitoring and verification purposes. The Covenant requires the submission of a Monitoring Emissions Inventory (MEI), an Implementation Report and an Action Report, providing information as set out below:

Table 8.1 Covenant of Mayors submission requirements

Action Report	• This report is due on year 2, 6, 10, 14 etc. (alternatively every 2 years from SEAP submission date) • Qualitative information about the implementation of the SEAP. It includes an analysis of the situation and qualitative, corrective and preventative measures. • Does not need to include Monitoring Emissions Inventory (MEI) submission
Implementation Report	• This report is due on year 4, 8, 12, 16 etc. (alternatively every 2 years from SEAP submission date) • Quantitative information on actions implemented and and related impact on CO_2 emissions and energy consumption, an analysis of the SEAP implementation process, including corrective and preventive measures when this is required. • Includes Monitoring Emissions Inventory (MEI) submission.
Monitoring Emissions Inventory (MEI)	• CO_2 emissions reporting, similar to original Baseline Emissions Inventory (BEI) submission. • First MEI due at least 4 years from SEAP submission date.

The Covenant of Mayor's Office is currently developing a standardised monitoring report system/model, to be available in 2013. In the meantime South Dublin County Council will develop a SEAP monitoring template based on general Covenant of Mayors guidance and existing European best practice.

This review template will showcase key achievements in the implementation of SEAP actions and degree of fulfilment of energy efficiency and CO_2 reduction commitments. The review will also include a full assessment of all actions including current status (complete/ongoing or planned), barriers, lessons learnt, investment and next steps.

A structured database, analysing defined indicators will form the technical basis of the review. This database could be updated regularly so as to ensure momentum is maintained in the SEAP process. External agencies, such as Central Statistics Office (CSO), National Transport Authority (NTA), CODEMA and SEAI, will have an important role in this regard. Data from current and future programmes and projects, such as the 'Public Energy Partnership 2012', will be a critical component of such a review.

The review process should not only monitor existing actions but also facilitate the amendment of existing actions, development of new actions, as well as, details on any rejected actions. The template, will therefore, need to be flexible in its design. The review should include the identification of problems and opportunities that have arisen, including those relating to for example, technological, financial, and human resources available.

The combination of behavioural change actions with physical measures and works will continue to be critical in reversing the upward trend in energy consumption, and associated CO_2 emissions, and both will be critical to ensure that 2020 targets and beyond are achieved. Future reviews will continue to encourage the development of these two strands simultaneously. Whilst many of the behavioural change actions are difficult to measure in terms of CO_2 emissions, these actions will be measured in terms of clear goals, target groups, attendance rates and follow-up feedback etc.

8.3 SEAP Indicators

SEAP indicators will be required to track the progress and performance of SEAP actions in reducing CO_2 emissions and energy consumption, in line with 2020 reduction targets. South Dublin County Council has compiled a range of indicators as set out in Table 8.2.

Table 8.2 SEAP Indicators

Indicators	Action Ref	Description
IND1: Number of SDCC large energy users recorded and associated energy data measured	REC1, REC2, RED1, RED5, RED6, RED7, RED8	SDCC Energy Action Team to carry out data collection and analysis on an ongoing basis. Data collection to include bill analysis, smart metre analysis etc
IND2: Number of buildings and related energy data included in Heat Mapping Tool	REC4	SDCC to obtain data from a variety of sources across sectors on a regular basis, including sources such as SEAI. Process to commence with heat mapping of municipal buildings data.
IND3: Energy consumption of households	REC5, RED4	Energy consumption and householder energy bill data to be collated annually using SDCC, private householder and SEAI data. Data to also include BERs and number of SDCC residential dwellings refurbished / upgraded.
IND4: Number of SDCC and Public energy awareness campaigns undertaken and number of attendees recorded	REC3, RED2, RED3	At all events number of attendees to be recorded and contact information used for follow up contact

IND5: Number of schools involved in energy initiatives and total annual savings recorded	RED11	Data to be collated on an ongoing basis to reflect number of staff / pupils involved and information relating to upgrade / refurbishment works undertaken
IND6: Number of businesses engaged in energy initiatives and total annual savings recorded	RED9, RED10	Data to be collated on an ongoing basis to reflect number of businesses / staff involved and information relating to upgrade / refurbishment works undertaken
IND7: Percentage and breakdown of population within the County travelling to work or school by public transport or non-mechanical means	RED12, RED13, RED14, RED16, RED17	Data to be obtained from CSO (every five years) and public transport operators (annually). Data collection to also include information from SDCC Smarter Travel projects including PTPs, local permeability projects, cycle networks, Work Travel Plans implemented etc.
IND8: Number of dwellings and commercial properties located within appropriate catchment areas to high frequency public transport services	RED12	SDCC to develop mapping system using data provided from CSO (every five years) and public transport operators (annually)
IND9: Renewable energy generation	REP1, REP2	SDCC to monitor planning permissions for renewable developments and generation information received from private sector on an ongoing basis. Process to commence with establishment of renewable energy baseline as of 2013.
IND10: Further development of feasibility studies exploring renewable and low carbon technologies / strategies	RED13	SDCC to collate information on an ongoing basis relating to the further development of renewable studies undertaken and information disseminated, including electric vehicles roll out information

8.4 Review of wider SEAP Development Process

South Dublin County Council operating alone cannot meet 2020 targets. The public and private sectors will need to continue to work together with all the various stakeholders, co-operating and encouraging capacity building. Other local authorities will also have valuable information and ideas from which South Dublin County Council can learn.

Any review of the SEAP development process will also have to closely examine funding of actions and barriers to attaining such financial assistance. Whilst many of the wider County based actions are reliant on national government funding, more locally based actions require funding options and partnerships to be developed. In the medium to long term significant investment in infrastructure will be required to meet energy targets, especially in the areas of renewable energy and district heating. A trans-border approach linking with neighbouring local authorities may also have a role in accessing funding for geographically wide-ranging projects.

The SEAP review process will also be undertaken against a backdrop of reviews of key policy documents, including the National Energy Efficiency Action Plan (NEEAP) 2009-2020, the National Renewable Energy Action Plan (NREAP) 2010 and the South Dublin County Council Development Plan. The review process for the South Dublin County Council Development Plan will commence in 2014, in which energy planning and renewable energy infrastructure will be a key consideration.

CHAPTER 9: CONCLUSIONS

9.1 Actions across all sectors

South Dublin County faces a challenge in realising 2020 energy and CO2 reduction targets, at both a local/ community level as well as at a wider County basis.

South Dublin County Council has a proven track record in pioneering activities in sustainable development and energy efficiency, which have had wide involvement across the County. Having recognised a 2006 countywide energy baseline and identified shortfalls in realising 2020 targets, the SDCC response has been to target SEAP actions in areas that it has influence on and control over; actions have been structured under the SEAP principles of Record, Reduce and Replace. By developing links and empowering change in the following key areas: commercial, institutional, residential, community, land use and transport, SDCC will continue to positively influence all energy users.

In preparing its first SEAP, the Council recognises that measuring the impact of individual actions will require time and, as such as part of the SEAP monitoring process, the impact of individual actions and the cumulative benefit of actions, on energy efficiency savings and CO2 savings will be analysed and reported on. Reviews of the South Dublin SEAP in the future will provide updated information on efficiency savings and CO2 savings resulting from individual action implementation and also the cumulative benefit of actions.

The delivery of a low carbon County will be achieved by collaboration from all groups within South Dublin County. Participation from schools, businesses, public bodies, community groups, industry, transport companies and private individuals is critical to the attainment of energy targets.

9.2 Renewable Energy

It is recognised that, whilst energy efficiency measures are critical in terms of reducing energy demand and CO2 emissions, there is also significant renewable energy potential in the County. By developing renewable energy strategies, such as the Local Authority Renewable Energy Strategy (LARES), we can unlock renewable energy opportunities and share this knowledge with the private sector to encourage investment in the renewable energy sector across South Dublin County.

Renewable projects being undertaken by the Council will continue to act as a catalyst for new renewable technologies in the wider County. Expertise and support available in the Council will continue to support such projects and create an environment that nurtures new technologies thereby maximising potential environmental and economic gains through such ventures.

9.3 Investment & Finance

Actions identified in this SEAP are based on a range of funding sources from private investment to funding from national sources such as the National Transport Authority (NTA), Department of Transport, Tourism & Sport and the Sustainable Energy Authority of Ireland (SEAI). Identifying new funding sources – both national and EU based, will be critical if existing and new actions are to be successfully implemented.

9.4 Future Policy & Actions in Ireland 2013 to 2020

The success of EU directives has been varied across Europe, overall progress and projections are promising, but it is acknowledged that further progress is required to ensure that the "20-20-20" targets are met.

On October 25th 2012, Directive 2012/27/EU on energy efficiency was adopted. The following measures proposed in this new directive are relevant to South Dublin County and to SEAP actions and monitoring in the future:

- Public sector to lead by example: Public bodies will push for the market uptake of energy efficient products and services through a legal obligation to purchase energy efficient buildings, products and services. They will further have to progressively reduce the energy consumed on their own premises by carrying out the required renovation works covering at least 3% of their total floor area per year.

- Legal obligation to establish energy saving schemes in all Member States: Energy distributors or retail energy sales companies will be obliged to save 1.5 % of their energy sales per year, by volume, through the implementation of energy efficiency measures such as improving the efficiency of the heating system, installing double glazed windows or insulating roofs, among final energy customers.

- Major energy savings for consumers: Easy and free-of-charge access to data on real-time and historical energy consumption through more accurate individual metering will now empower consumers to better manage their energy consumption. Billing should be based on the actual consumption reflecting actual data from metering.

- Industry: Incentives for Small & Medium Enterprises (SMEs) to undergo energy audits and disseminate best practices, while larger companies will have to make an audit of their energy consumption to help them identify the potential for reduced energy consumption.

- Efficiency in energy generation: Monitoring of efficiency levels of new energy generation capacities, establishment of national heat and cooling plans as a basis for a sound planning of efficient heating and cooling infrastructures, including recovery of waste heat.

It is expected that the new provisions of the directive will be transposed into Irish legislation in 2013; the Irish government is in the process of revising and updating the National Energy Efficiency Action Plan (NEEAP) 2009-2020, to reflect the new directive.

9.5 Beyond 2020

The energy targets outlined in Chapter 2 provide clear goals for South Dublin County Council, but further EU targets to 2050 (energy emission reductions in the range of 80% - 95%), presents additional challenges. By implementing energy actions reflecting SEAP principles of Record, Reduce and Replace, South Dublin County can lead the way in encouraging all sectors to address shortfalls identified to 2020. At that stage, the Council will be in a confident position to put forward actions to address more long term energy targets. The Council is also committed to monitoring SEAP actions on a yearly basis, to provide data to all stakeholders, to assist in mapping and modelling energy data which will be critical in consideration of more long term energy targets.

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

leap leadership for energy action and planning

Appendix A
South Dublin Baseline Emissions Inventory (BEI)

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

SOUTH DUBLIN SUSTAINABLE ENERGY ACTION PLAN

BASELINE EMISSIONS INVENTORY

DECEMBER 2012

Introduction

South Dublin County Council, in partnership with the Town and Country Planning Association (TCPA) and eight other local authorities across the EU, is embarking on its first Sustainable Energy Action Plan (SEAP). This project is being carried out under the EU Intelligent Energy Europe (IEE) funded Leadership for Energy Action and Planning (LEAP) programme. This Baseline Emissions Inventory provides a comprehensive starting point for the energy debate among stakeholders, citizens and business owners in South Dublin County. It will also be used to inform energy action development, the main focus of the South Dublin SEAP.

The overall energy consumption and emission figures for South Dublin County in 2006 are indicated in Table 1 below. As is shown, the total energy consumption was 6.83 TWh/yr and the corresponding figure for the total CO^2 emissions was 2,396 Ktonnes/yr.

South Dublin County Council's own energy consumption/ emissions figures are also indicated in Table 1.

Table 1: Total Energy Consumption/CO^2 Emissions South Dublin, 2006

Sector	Total Energy Consumption (TWh/yr)	Total CO^2 Emissions (ktonnes CO^2/yr)
Residential	1.32	607
Commercial	2.48	1014
Transport	2.99	757
South Dublin County Council	0.047	18
All Sectors	6.83	2,396

Context

Leadership for Energy Action and Planning (LEAP) has been set up to help participating local authorities address the EU's challenging energy and climate change targets for 2020 by embedding sustainable energy policy within their operations and practices. LEAP aims to increase the ability of EU local authorities to pioneer and promote the use of sustainable energy measures and the move towards a low-carbon local economy. It aims to tackle the barriers to adopting and implementing sustainable, local energy planning policies, focusing on professional and political leadership, skills and knowledge, clear policy messages and resources.

Ireland's import dependence for energy remains at close to 90%, while the EU average remains at 55% (SEAI, June 2011). The energy profile of South Dublin County can be expected to reflect the national picture. The South Dublin SEAP will be the key document outlining how the County aims to address energy efficiency and CO^2 emissions through a series of actions across all sectors. These actions will be developed in partnership with regional, National and European stakeholders. Furthermore, the SEAP will identify options for renewable energy alternatives in South Dublin County, with the aim of addressing our heavy dependency on imported fossil fuels. Whilst it is acknowledged at a national level, that Ireland has significant wind energy capacity (particularly off-shore wind energy); the SEAP process provides a unique opportunity to investigate the feasibility of renewable energy alternatives in a more localised context.

South Dublin County Council since its establishment in 1994 has endeavoured to promote a more sustainable urban pattern through densification and growth of urban villages, diversification and intensification of commercial uses and the use of planning to secure increased and viable public transport. South Dublin County, which has experienced significant growth in the past ten years, now has a population of approximately 265,000 persons and a housing stock of 98,000 (Census 2011). The County is also base to over 6,000 businesses. There is a range of transport infrastructure in South Dublin County, the N4, N7, N81 and M50 pass through the County. There is also significant public transport provision in South Dublin County and there have been ongoing improvements in this area recently.

Within this context, it is acknowledged that the climate change challenge is an important consideration in developing future policies and objectives to safeguard the continuing sustainable development of the County. The South Dublin SEAP is recognised as an important first step in developing evidence based approaches to policy development, ultimately informing the preparation of future plans and strategies.

Efforts to improve the competitiveness of the South Dublin economy would benefit from increased evidence based policy attention to measures to enhance productivity, innovation and ultimately competitiveness. Reducing energy costs for South Dublin businesses is critical in this regard. Organisations such as South Dublin Chamber of Commerce are important partners in the development of the South Dublin SEAP; South Dublin County Council's involvement in LEAP is recognised as a strategic catalyst in stimulating wider understanding of energy efficiency issues and in communicating opportunities available for reducing energy costs.

South Dublin County Council is committed to acting as a focal point for the reduction of energy usage and the growth of renewable energy technologies and strategies in the County. The Council knows it is not alone in its vision. The momentum and chain of effort being fostered by South Dublin County Council, must extend into the community, from residents and action groups at neighbourhood level, through to the enthusiasm of schools and extending to individual householders and business owners to act separately or as cooperatives to improve the fabric of their homes and premises, thereby saving money and energy. The development of the South Dublin SEAP is recognised as an important vehicle in bringing energy efficiency to the forefront of the future growth of South Dublin County.

This Baseline Emissions Inventory will be used as a basis to formulate SEAP energy action development. 2006 was chosen as the base year for the Baseline Emissions Inventory, largely due to the sources of data available, such as the Census of Population. The National Transport Authority (NTA) traffic data used in calculating Light Duty Vehicles (car, van) and Heavy Goods Vehicle (HGV) emissions also uses 2006 as the base year. In terms of assessing the energy baseline for the County, the residential, commercial and transport sectors were individually calculated; the methodologies for such calculations are outlined below.

The South Dublin SEAP is supported by CODEMA (Dublin's energy agency) and the Sustainable Energy Authority of Ireland (SEAI). In October 2011, SEAI designated Tallaght as one of three new exemplar Sustainable Energy Communities (SEC) in Ireland. The SEC programme aims to develop a series of Irish communities as 'living laboratories' to establish a culture of innovation and facilitate the emergence of new sustainable energy technologies and practices that grow energy smart towns and cities. Involvement in the SEC programme will assist in the development of the South Dublin SEAP.

The SEAP is also being carried out in accordance with the EU Covenant of Mayors protocol. This plan also supports and reinforces the National Energy Efficiency Action Plan (NEEAP) 2009-2020 that sets out the path in achieving a 20% (33% for the public sector) reduction in energy demand by 2020. It also supports the policies and objectives of South Dublin County Council Sustainable Energy Strategy 2008 and South Dublin County Council Climate Change Strategy 2009.

This Baseline Emissions Inventory provides a comprehensive starting point for the energy debate among stakeholders, citizens and business owners in South Dublin County. If we are to make the transition to a low carbon economy, local communities will need to understand the challenges posed by reducing carbon dioxide emissions, the positive solutions that are available, and the benefits of such solutions for both current and future generations. It is the businesses, communities and individual citizens who consume energy at home, at work and travelling in between that are critical for the ultimate success of the South Dublin Sustainable Energy Action Plan.

Background

There are a number of plans, projects and initiatives which are relevant to the South Dublin Sustainable Energy Action Plan as they set the context for the project.

European Policy Context

EU Energy Efficiency Directive (COM (2011) 370)

On 22 June 2011, a new set of measures for increased energy efficiency were unveiled by the EC. The Directive includes measures to assist Members States' efforts to use energy more efficiently at all stages of the energy chain – from the transformation of energy and its distribution to its final consumption. Measures include: a legal obligation to establish energy saving schemes in all Member States; public sector to lead by example; and major energy savings for consumers.

EU Renewables Directive (ESD2009/28/EC)

The Renewables Directive mandates levels of renewable energy use within the European Union. The directive requires member countries to produce a pre-agreed proportion of energy consumption from renewable sources such that the EU as a whole shall obtain at least 20% of total energy from renewables by 2020. Ireland's renewable energy target is 16%.

EU End User Efficiency and Energy Services Directive 2007 (ESD 2006/32/EC)

The Energy End-Use Efficiency and Energy Services Directive provides a framework for ensuring that when energy is finally consumed, it is done so in a more efficient and economic way. The Directive applies to providers of energy efficiency improvement measures, energy distributors, distribution system operators and retail energy sales companies, as well as final customers. Member States are required to submit National Energy Efficiency Action Plans to the European commission in 2007, 2011 and 2014.

The EU climate and energy package

In March 2007 the EU's leaders endorsed an integrated approach to climate and energy policy that aims to combat climate change and increase the EU's energy security while strengthening its competitiveness. They committed Europe to transforming itself into a highly energy-efficient, low carbon economy.

A series of demanding climate and energy targets to be met by 2020 were set; these are known as the "20-20-20" targets.

These are:

- A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels
- 20% of EU energy consumption to come from renewable resources
- A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

The EU leaders also offered to increase the EU's emissions reduction to 30%, on condition that other major emitting countries in the developed and developing worlds commit to do their fair share under a global climate agreement.
In January 2008 the European Commission proposed binding legislation to implement the 20-20-20 targets. This 'climate and energy package' was agreed by the European Parliament and Council in December 2008 and became law in June 2009.

The core of the package comprises four pieces of complementary legislation:

1. A revision and strengthening of the Emissions Trading System (ETS), the EU's key tool for cutting emissions cost-effectively.
2. An 'Effort Sharing Decision' governing emissions from sectors not covered by the EU ETS, such as transport, housing, agriculture and waste. Under the Decision each Member State has agreed to a binding national emissions limitation target for 2020 which reflects its relative wealth.
3. Binding national targets for renewable energy which collectively will lift the average renewable share across the EU to 20% by 2020 (more than double the 2006 level of 9.2%).
4. A legal framework to promote the development and safe use of carbon capture and storage (CCS).

National Policy Context

White Paper on Energy Efficiency 2007

The primary objectives of the White Paper is to ensure security of energy supply, environmental sustainability and economic competitiveness. The White Paper seeks to achieve an energy market in 2020 whereby there will be a reliable supply of energy, highly efficient use of energy, competitive prices and sustainable and diverse energy sources. The White Paper envisages that by 2020, the Irish energy enterprise sector will be a market-led, knowledge based sector characterised by innovation and driven by research and technology developments.

National Energy Efficiency Action Plan 2009-2020

Ireland's 2009-2020 National Energy Efficiency Action Plan builds on the previous plan submitted to the European Commission in 2007. Published in May 2009, the updated plan outlines 90 measures to reach Ireland's national target of a 20% reduction in energy demand by 2020. Key measures include:

- Launching a multi-annual National Insulation Programme for Economic Recovery to assist homeowners and vulnerable members of society to substantially reduce their energy bills;
- Supporting business to become more competitive through tax allowances for energy-efficient technologies, energy management tools and support programmes;
- Driving the public sector towards purchasing only green goods and services.

The Action Plan also contains analysis of untapped potentials in various sectors, and specific provisions for monitoring implementation of the plan. This includes the establishment of an inter-departmental group involving key delivery organisations. Other working groups will be established as needed, with a Public Sector Energy Efficiency Group to be convened given the important role played by the public sector in reaching the national target.

National Renewable Energy Action Plan (NREAP) 2010

The EU Directive 2009/28/EC requires Ireland to ensure that 16% of total final energy consumption comes from renewable energy sources by the year 2020. The National Renewable Energy Action Plan sets out Ireland's national trajectories for the share of energy from renewable sources consumed in transport, electricity and heating and cooling to 2020.

National Climate Change Strategy 2007-2012

The National Climate Change Strategy 2007 - 2012 sets out a range of measures to ensure Ireland reaches its target under the Kyoto Protocol. The Strategy provides a framework for action to reduce Ireland's greenhouse gas emissions within a five year period.

Regional Policy Context

Regional Planning Guidelines for the Greater Dublin Area, 2010-2022

The Regional Planning Guidelines for the Greater Dublin Area provide for an integrated model of policy development, with economic, infrastructure and settlement policies being interdependent. In the South Dublin County context, this integrated approach seeks to clearly promote sustainable growth and build sustainable communities. More specifically the following strategic recommendations are identified as being of particular relevance within the SEAP context;

- Development Plans and Local Authorities support, through policies and plans, the targets for renewable generation so that renewable energy targets for 2020 are met;
- That low carbon sustainable renewable energy systems, bio-energy and energy conservation potentials are exploited to their full potential.

County Policy Context

South Dublin County Council Development Plan 2010-2016

Adopted in October 2010, the Development Plan promotes a series of policies that encourage sustainable energy usage and supports the development of alternative energy sources in the County in response to changing needs. The objective to prepare a sustainable energy policy and mapping system for the County was also identified.

South Dublin County Council Sustainable Energy Strategy 2008

The South Dublin County Council Sustainable Energy Strategy was prepared by an interdepartmental, multi-disciplinary Working Group. The strategy outlines aims and objectives for achieving improvements in energy systems and supplies, resulting in greater efficiencies while securing long term sustainability with limited impact on climate, local environment and public health.

South Dublin County Council Climate Change Strategy 2009

The South Dublin County Council Climate Change Strategy was prepared through the Environment Strategic Policy Committee (SPC) and with the support of CODEMA. The Climate Change Strategy is in accordance with the National Climate Change Strategy and covers the years 2009-2012 in the short-term, but also takes into account a medium-term view to 2020 and beyond. Five focus sections have been chosen for the strategy - energy, planning, transport, waste management and biodiversity. Actions and key performance indicators under each of these headings are set out.

South Dublin County Development Board Strategy, 2002-2012

A Place for People is a ten-year strategy developed by South Dublin County Development Board for the social, economic and cultural development of South Dublin County. It aims to improve the quality of life of people who live, work and visit South Dublin County up to the year 2012. Specifically, the strategy aims to develop South Dublin as a collaborative place, developing networks and issue based collaboration.

South Dublin County Council Corporate Plan 2010-2014
South Dublin County Council's Corporate Plan was adopted in 2010 and provides a number of key policy objectives which strongly underpin the SEAP including the following;

- Collaborate with state agencies and other interested parties to ensure a cohesive response to the business community needs;
- Support existing business infrastructure through co-ordinated thinking;
- Promote an energy efficient County that will be cost effective;
- Promote Tallaght as a new energy zone through the use of energy mapping;
- Continue to foster linkages with educational institutions, business and public sector to promote enterprise in South Dublin;
- Expand the use and sharing of spatial data to enable more effective and integrated service and infrastructural planning.

South Dublin County Council Energy Management Action Plan

The Council's commitment to the energy targets of the National Energy Efficiency Action Plan has resulted in its engagement with SEAI's Energy Management Action Plan (MAP). The programme aims to prioritise energy use and efficiency across all Council functions. An interdisciplinary team of Council staff has been established, comprising staff from a range of technical backgrounds and an 'Energy Champion' has been appointed. The project is supported by CODEMA (Dublin's Energy Agency). Central to the development of the project is the establishment of an energy baseline of Council activities and the identification of energy efficient measures and initiatives ('Register of Opportunities') that will reduce Council energy use, cost and associated CO^2 emissions. The Energy Management Action Plan project has allowed energy efficiency to become a priority in Council operations and has created momentum for the implementation of a wider range of energy saving initiatives.

Local Project Context

Tallaght Pilot Energy Study

As a first step in the process of developing a long term sustainable energy strategy for the county, it was decided to prepare an energy masterplan for the Tallaght Town Centre area. The establishment of a countywide energy profile is a critical step in determining a long term energy strategy for the county. Such a profile helps in the identification of areas of high and low energy consumption and highlights locations where alternative energy sources might be considered. In order to begin the process of attaining the information required for the whole county, it was decided to carry out a pilot energy study in the Tallaght Town Centre area. South Dublin County Council also regarded the study as an opportunity to begin looking at energy planning at the local level. The success of this pilot study resulted in the development of the first Sustainable Energy Community within the County.

Tallaght Sustainable Energy Community (SEC)

In 2010 members of the SDCC Energy Action Team, together with other stakeholders in Tallaght Town Centre, established the Tallaght Sustainable Energy Community. In October 2011, following a competitive process, the Sustainable Energy Authority of Ireland (SEAI) designated Tallaght as one of three new exemplar Sustainable Energy Communities (SEC) in Ireland. SEAI's Sustainable Energy Communities Programme aims to develop a series of Irish communities as 'living laboratories' to establish a culture of innovation and facilitate the emergence of new sustainable energy technologies and practices that grow energy smart towns and cities. To facilitate delivery of the Tallaght SEC, a number of Action Groups are being set up to co-ordinate and implement a range of projects and initiatives across all sectors (including residential and business pilot projects), with the main aim of increasing energy efficiency, reducing CO^2 emissions and saving energy costs. The South Dublin Chamber of Commerce is an important stakeholder in this project and will play a pivotal role in the potential rolling out of pilot projects and initiatives.

South Dublin's 'Improving Business Competitiveness Action Plan 2011-2013'

A largely employment based initiative, this Action Plan has identified the following eight actions/outcomes for South Dublin;

- South Dublin County has become more attractive as a location enabling the IDA to locate strategic and Foreign Direct Investment: Grange Castle Business

Park is competitive in national and global markets with in creased employment;

- The re-balancing of infrastructural costs has facilitated the expansion of business in South Dublin;
- South Dublin County is established as a major inter national digital services centre capable of attracting in novative employment;
- The Rates base in South Dublin has expanded;
- Business development supports are maximised in South Dublin County;
- Business sustainability and development programmes have been delivered as part of collaboration with South Dublin Chamber of Commerce;
- Government placement schemes for the unemployed are maximised;
- The Creative Village project has been established.

Analysis of Residential Sector

Analysis of residential energy emissions/consumption for South Dublin County has been undertaken in two stages; firstly energy values relating to those dwellings under the ownership of South Dublin County Council have been calculated. Secondly energy values for all dwellings in South Dublin County have been subsequently extrapolated as a separate exercise. This has been done for two main reasons; firstly, more comprehensive data is available on the housing stock under the ownership of the Council and secondly South Dublin County Council will have more control and involvement in Council owned dwellings, which will be critical in terms of identifying and implementing future actions and energy targets.

Stage 1: Council owned Dwellings in South Dublin County

The first stage in calculating the residential baseline was to determine the energy emissions ($kgCO^2/yr$) and energy consumption (kWh/yr) figures for all Council owned dwellings in 2006. These results were based on an analysis of the BER's (Building Energy Ratings[3]) which have been undertaken for 1,158 Council dwellings in South Dublin County Council ownership. A Building Energy Rating gives details on the energy performance of a home in terms of primary energy usage (expressed as $Kwh/m^2/yr$) and carbon emissions (expressed as $kgCO^2/m^2/yr$).

The analysis of the BER's was broken down into four different categories of house types, namely, detached, semi-detached, terraced and apartment. The average emissions and consumption figures for each of the four house types, was determined. The total number of dwellings owned by the Council (8,115 in 2006) as well as the breakdown of numbers for each of the four house types was determined through an analysis of the Council's technipoint database[4].

The average energy emissions/consumption rate for each of the house types (from the BER analysis) was then multiplied by the total number of dwellings for each of the house types. This gave a total energy consumption (kWh/yr) and energy emissions ($kgCO^2/yr$) rate for all Council owned dwellings in 2006. These results are indicated in Table 1 below.

Table 1: Energy Consumption[5]/Emissions[6] for All Council Owned Dwellings, South Dublin, 2006

Total Council Owned Dwellings	Total Energy Consumption (KWh/yr)	Total CO^2 Emissions ($kgCO^2/yr$)
8,115	120,660,068 (0.12TWh/yr)	46,349,973 (46.3 ktonnes/yr)

Stage 2: All dwellings in South Dublin County

The second stage involved an analysis of the Census of Population, which indicated that there were 78,474 dwellings[7] in South Dublin County, in 2006. A breakdown of total number of dwellings for each of the house types, namely, detached, semi-detached, terraced and flat/apartment was also determined from the Census.

An analysis of approximately 120,000 BER's (Building Energy Ratings) nationally has been undertaken by SEAI. This analysis provided the average national energy consumption (KWh/yr) for each house within each housetype. This figure was then multiplied by the total number of dwellings for each of the four house types in South Dublin County to determine the total energy consumption value (KWh/yr) for each house type. The total energy consumption for each of the house types were then added together to determine the total energy consumption for all dwellings in South Dublin County in 2006 (see Table 3).

The total carbon emissions ($KgCO^2/yr$) for the County was determined by using the average $KgCO^2$ emissions for each house type for Council dwellings outlined in stage 1 and multiplying this by the total number of dwellings in the County for each of the house types (Census of population, 2006). This resulted in total $KgCO^2$ emissions for each of the house

types, which when added, provided the total $KgCO^2$ emissions for all dwellings in the County (see Table 2).

To convert residential sector calculations to total final energy consumption, SEAI standards for electricity use per dwelling type in Ireland were used.

Table 2: Energy Consumption/Emissions for All Dwellings, South Dublin, 2006

All Dwellings	Total Energy Consumption (KWh/yr)	Total CO^2 Emissions ($kgCO^2$/yr)
78,474	1,316,586,956 (1.3 TWh/yr)	606,873,857 (607 ktonnes/yr)

Analysis of Commercial Sector

Analysis of energy usage in the commercial sector was subdivided between services, industry and community. For the purpose of energy baseline, the sectors have been broken into use categories as defined in the 'Chartered Institution of Building Services Engineers'[8] (CIBSE's).

All calculations within the commercial sector are based on floorspace for certain uses (provided by the Valuation Office) multiplied by standardised energy scores associated with such uses (based on CIBSE).

The floorspace for the various uses was provided by the Valuation Office[9]. The CIBSE standardised energy scores are extracted from the UK based CIBSE.

The results of multiplying the floorspace by the standardised energy score are outlined in Table 3 below (total energy consumption in KWh).

Table 3: Total Energy Consumption for Commercial Sector (KWh)

Sector	Energy Consumption (KWh)		
	Fossil Fuel	Electricity	Total
Services	370,204,431	332,850,328	703,054,759
Industrial	962,418,732	628,226,185	1,590,644,917
Community	156,276,612	30,106,004	186,382,616
Total			2,480,082,292 (2.48 TWh/yr)

Using CIBSE standards to determine baseline energy figures has resulted in the energy usage being classified as either electricity or fossil fuel (which includes all other energy usage). Assumptions had to be made, therefore, on the breakdown between oil and gas, (and also with coal in the case of industry) which was done based on Ireland's national energy profile (provided by SEAI[10]). This involved applying the national breakdown between oil and gas (and coal) to the energy usage for each of the three commercial sectors in South Dublin County.

The results of this calculation (energy usage in electricity, oil, natural gas and coal) were then multiplied by standardised conversion factors (from the SEAI) in order to determine the total energy emissions figures in Kg of CO^2. These results are outlined in Table 5 below, indicating a total energy baseline of 1,014,385,082 Kg CO^2 for the commercial sector. As is evident in Table 4, the largest emissions come from industry, where the emissions account for 64% of all emissions in the commercial sector.

Table 4: Total Energy Emissions for Commercial Sector ($KgCO^2$ per unit)

Sector	Total $KgCO^2$
Services	308,239,946 $KgCO^2$ (308 ktonnes/yr)
Industry	650,246,100 $KgCO^2$ (650 ktonnes/yr)
Community	55,899,036 $KgCO^2$ (56 ktonnes/yr)
Total Commercial	1,014,385,082 $KgCO^2$ (1,014 ktonnes/yr)

Two other sectors that contribute to energy consumption and its associated greenhouse gas emissions are agriculture and extractive industries (such as mining). Both of these sectors are represented in the South Dublin County area but have been omitted at present in the contained calculations. There are several reasons for this, firstly in terms of the extractive industries the fact that some are engaged in carbon trading schemes makes calculations of their contributions to climate change more complicated. Secondly in terms of agriculture, energy calculations for such a dispersed activity can be problematic along with an agreed upon methodology for such a calculation, in addition large portions of the rural land within South Dublin's boundaries are engaged in forestry which contribute to 'carbon sinks' nationally, as carbon sinks have not been subjected to a rigorous methodology as yet this would again prove problematic in terms of calculations and harmonisation with the other sectors represented. South Dublin will endeavour in future calculations to consider these sectors.

Analysis of Transport Sector

South Dublin County is an important part of the Dublin City Region and is strategically located along three major road corridors in the State, the N4 to Sligo and Galway, the N7 to Limerick and Cork and the N81 to Tullow. Dublin's orbital motorway, the M50 runs through South Dublin County and forms part of the strategic Euro Route connecting Belfast to Rosslare. As a result the quantum of vehicular traffic, including Heavy Goods Vehicles, passing through the County, is significant. For the purposes of the Baseline Emissions Inventory it was considered appropriate to include emissions from 'through traffic' as this is considered a large contributing factor to overall CO^2 emissions generated in South Dublin County.

There is significant public transport provision in South Dublin County and there have been ongoing improvements in this area in recent years. LUAS, Dublin's light rail / tram system runs through the County with a terminus in both Tallaght (County Town) and Saggart. Dublin Bus provides a comprehensive service in the County and a number of Quality Bus Corridors are in operation. The main sub-urban, commuter and inter-city rail services serving the Dublin commuter belt, the Greater Dublin Area and the West (terminating at Heuston Station) all pass through South Dublin County.

There are two aerodromes located in South Dublin County, Weston Airport (private airport) and Casement Aerodrome, Baldonnell (Department of Defence). Given the non-commercial nature of these airports and the lack of available data relating to aircraft emissions at these airports, it is not intended to include them in BEI calculations at this stage.

Pedestrian & Cyclist Journeys

Based on the Dublin Transportation Office (DTO) 'Greater Dublin Area Household Survey 2006[11], the National Transport Authority estimate that approximately 68 million walking journeys and 3.3 million cycling journeys were undertaken in the South Dublin County in 2006. The recorded average journey distance was approximately 1.1 kilometres for walking journeys and 4.5 kilometres for cycling journeys.

Car, Van & HGV Emissions

Given the significant volumes of car, van and HGV traffic operating on the South Dublin County road network, the National Transport Authority (NTA) was engaged to provide traffic data for the 2006 BEI base year. This data was used to calculate car, van (Light Duty Vehicles) and HGV CO^2 emissions.

Using 2006 AADT (Annual Average Daily Traffic Flow) data, including AM and Off-Peak hours for both the Greater Dublin Region and also for the sub-set of links relating to South Dublin County, total kilometres travelled by cars, vans and HGVs and total CO^2 produced by these modes of transport was calculated. The UK standard 'Design Manual for Roads and Bridges' (DMRB)[12] was used to calculate CO^2 emissions.

The DMRB software requires the following inputs to calculate vehicle CO^2 emissions:

- Link lengths;
- Annual Average Daily Traffic Flow (AADT) data;
- Average vehicle speeds;
- Traffic composition; and
- Road Type.

The 2006 total vehicular kilometres and CO^2 Emissions for light duty vehicles and heavy goods vehicles for South Dublin County is shown in Table 5.

Table 5: 2006 Energy Consumption/CO^2 Emissions for LDV's & HGV's

Traffic Mode	Total Kilometres	Total Consumption	Total Emissions
LDV	3,456,199 Km	0.71 TWh	176.3 Ktonnes
HGV	2,305,683 Km	2.10 TWh	531.3 Ktonnes
Total	5,761,882 Km/yr	2.81 TWh/yr	707.6 ktonnes/yr

LUAS (light rail / tram system)

To calculate LUAS energy use (TWh) and CO^2 emissions (ktonnes) NTA modelling data based on the DTO 'Greater Dublin Area Household Survey 2006' was used. From this base data, the 2006 total annual personal kilometres for LUAS journeys in the South Dublin area is calculated as approximately 34,207,420 kilometres. LUAS estimate that approximately 0.0706 kg[13] of CO^2 is emitted per passenger kilometre, this would result in approximately 2,415,043 kg of CO^2 (2.4 Ktonnes).

To calculate LUAS electricity use the following conversion formula was used:

Energy Consumed X Conversion Factor = CO^2 Emitted

Energy Consumed =	CO^2 Emitted ---------- Conversion Factor

4,072,585 KWh	=	2,415,043 kg ---------- 0.593 (electricity)

To calculate KWh the emission factor for Irish electricity generation of 0.593 Kg/KWh[14] was used, resulting in 4,072,585 KWh (0.004 TWh).

Dublin Bus

Dublin Bus has provided the following data with regard to 2006 annual services[15] in the South Dublin area:

Number of Annual Passengers = 38 million Number of litres of Diesel = 12 million 32,000 tonnes of CO^2 130 million KWh approximately

To calculate Dublin Bus energy emissions the following conversion formula was used:

Energy Consumed x Conversion factor = CO^2 Emitted

130,000,000 KWh x 0.253 (diesel) = 32,890,000 kgCO^2

The above diesel conversion figure of 0.253 is derived from the Carbon Trust[16] conversion factors fact sheet. This results in 32.8 ktonnes and 0.13 TWh.

Irish Rail

In calculating energy use and CO^2 emissions generated by Irish Rail services, it was acknowledged that sub-urban, commuter and inter-city services departing and entering Dublin (via Heuston Station) pass through South Dublin County (along approximately 7.7 kilometres of rail track). Whilst commuter and inter-city services carry passengers to destinations outside the County, these services still generate energy use and CO^2 emissions in South Dublin County. In this regard, the most representative way to capture this broad range of Irish Rail services passing through the County was to base energy use and emissions calculations on overall passenger numbers.

Irish Rail estimate that approximately 30,000,000 passengers[17] pass through Heuston Station per annum. On this basis total passenger kilometres in the South Dublin area is calculated as follows:

Passenger numbers	x	SDCC Km	=	Total passenger km
30,000,000	x	7.7 km	=	231,000,000 km

To calculate total CO^2 emissions for Irish Rail services the Envronmental Protection Agency (EPA) conversion factor of 0.0443 kg CO^2 / passenger km[18] was used. This conversion factor is based on 2006 Irish Rail national data. This results in a total emissions figure of approximately 10,233,300 kg/ CO^2 (10.2 ktonnes).

To calculate Kwh the Carbon Trust diesel emission factor of 0.253 Kg/KWh[19] was used, resulting in 40,447,826 KWh (0.04 TWh).

Motor Bike

To calculate motorbike energy use (TWh) and CO^2 emissions (ktonnes) NTA modelling data based on the DTO 'Greater Dublin Area Household Survey 2006' was used. From this base data, the 2006 total annual personal kilometres for motorbike journeys in the South Dublin area is calculated as approximately 10,015,612 kilometres. The UK Department of Energy & Climate Change 'Conversion Factors for Company Reporting' estimate that approximately 0.103 kg[20] of CO^2 is emitted per standard motorbike passenger kilometre, this would result in approximately 1,031,000 kg of CO^2 (1.0 ktonnes).

To calculate energy use the following conversion formula was used:

Energy Consumed x Conversion Factor = CO^2 Emitted

Energy Consumed =	CO^2 Emitted ---------- Conversion Factor

4,072,585 KWh	=	1,031,000 kg ---------- 0.242 (petrol)

To calculate Kwh the Carbon Trust petrol emission factor of 0.242 Kg/KWh was used, resulting in 4,072,585 KWh (0.004 TWh).

Transport Sector – Total Emissions

A number of methodologies have been used to calculate energy consumption and CO^2 emissions for the transport sector. An overall total for this sector is presented in Table 6:

Table 6: 2006 Total Energy Consumtion and Emissions for Transport Sector (TWh & ktonnes)

Transport Mode	Fuel	Energy Consumption (Twh)	CO^2 Emissions (Ktonnes)
Pedestrians	n/a	0	0
Bicycles	n/a	0	0
Light Duty Vehicles	Petrol / Diesel	0.71	176.3
Dublin Bus	Diesel	0.13	36
Motor Bike	Petrol	0.004	1.0
LUAS	Electric	0.004	2.4
Irish Rail	Diesel	0.04	10.2
HGV's	Diesel	2.1	531.3
Total		2.99 TWh/yr	757.2 ktonnes/yr

South Dublin County Council Emissions

An energy baseline for Council operations has been completed; 2010 was chosen as the base year for these calculations as this was the year for which most data was available. These calculations were undertaken by the Council Energy Action Team, as part of SEAI's Energy Management Action Planning programme.

Table 7: Council Energy Consumption & Emissions

Category	Annual Electrical Consump-tion	Annual Heating Fuel Consump-tion	Total Annual Energy Consump-tion	Annual CO2 Emis-sions
Council Buildings	0.009 TWh	0.009 TWh	0.018 TWh	6.4 ktonnes
Public Lighting	0.015 TWh	-	0.015 TWh	8.3 ktonnes
Transport (Fleet)	-	-	0.014 TWh	3.4 ktonnes
Total	0.024 TWh	0.009 TWh	0.047 TWh	18 ktonnes

Baseline Emissions Inventory - Overall Results

The overall energy results for South Dublin energy consumption[21] and CO^2 emissions[22] in 2006 are contained in Table 8. As is shown, the total energy consumption for South Dublin was 6.83 TWh/yr and the corresponding figure for total CO^2 emissions was 2,396,458,939 Kg CO^2/yr (2,161 ktonnes).

The transport sector accounted for the largest sector in terms of energy consumption (44% of the total) while the residential sector accounted for the smallest (19%). The commercial sector accounted for 36% of all energy consumption in South Dublin County in 2006. In terms of total energy emissions, both the commercial and transportation sectors recorded the highest values, at 42% and 32% respectively, of the total emissions. Correspondingly, the residential sector accounted for 25% of all emissions in the County.

South Dublin County Council's own energy consumption and CO^2 emissions is also shown in Table 8.

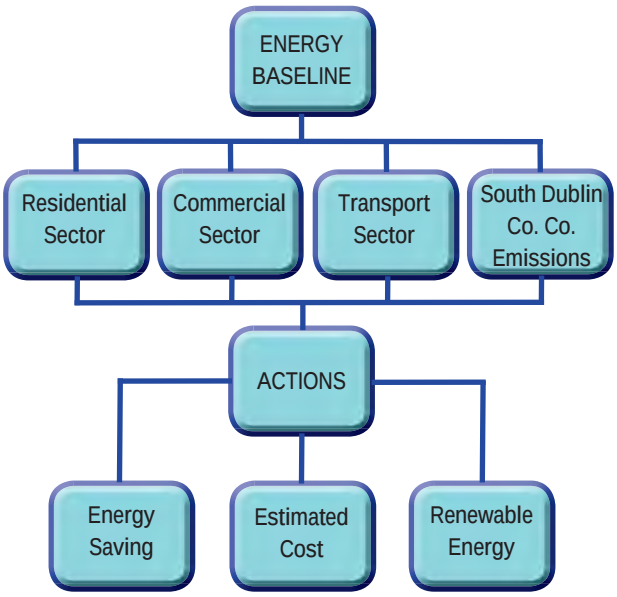
Table 8: Total Energy Consumption/Emissions South Dublin 2006

Sector	Total Energy Consumption (KWh/yr)	Total CO^2 Emissions ($kgCO^2$ /yr)
Residential	1,316,586,956 (1.32 TWh)	606,873,857 Kg CO^2 (606.9 ktonnes)
Commercial	2,480,082,293 (2.48TWh)	1,014,385,082 Kg CO^2 (1,014 ktonnes)
Transport	2,988,000,000 (2.99 TWh)	757,200,000 Kg CO^2 (757.2 ktonnes)
South Dublin County Council	47,000,000 (0.047 TWh)	18,000,000 Kg CO^2 (18 ktonnes)
All Sectors	6,831,669,248 (6.83 TWh/yr)	2,396,458,939 Kg CO^2 (2,396 ktonnes/yr)

What happens next?

Developing SEAP Actions

This Baseline Emissions Inventory defines the first stage of the South Dublin SEAP. The next stage involves compiling a schedule of energy efficiency actions aimed at all sectors outlined in the BEI. As South Dublin County Council has an important exemplar role to play in the development of this Plan, initial actions will focus on areas where the local authority has control and influence. These include actions centred on land use planning, building / facility management, public services, procurement and fleet efficiency. To inform and empower energy efficiency among South Dublin residents and businesses, the second range of SEAP actions will focus on buildings, equipment/facilities, commercial businesses, industries and transport. Some of these actions will also explore renewable energy alternatives for South Dublin County. There is scope within the SEAP for consideration of a third, more long term range of actions, for example renewable energy alternatives based on a district heating system. It is acknowledged that whilst such measures would involve significant capital investment, in consideration of EU energy targets to 2020, longer term measures should be included.



References and Acknowledgments

[1] Census of Population, Central Statistics Office, 2006

[2] National Transport Authority is a State body set up under statute in 2009. The role and functions of the NTA are set out in two Acts; the Dublin Transport Authority Act 2008 and the Public Transport Regulation Act 2009.

[3] Under the EU directive 'Energy Performance of buildings' 2006, a BER, is required at the point of sale or rental of a building. It is an indication of the energy performance of a home and it covers energy use for space heating, water heating, ventilation and lighting calculated on the basis of standard occupancy.

[4] Technipoint database is a SDCC database on the Council owned Housing Stock.

[5] Total energy consumption is expressed as KWh of energy usage per year. A Watt is the standard unit of electrical power, 1,000 Watts is called a kilowatt (kW) and 10^{12} Watts is a TWh

[6] Total CO^2 emissions refers to $kgCO^2$ emitted per year. $kgCO^2$ refers to 1,000g of CO^2 per year, while Ktonnes refers to 1,000,000 $kgCO^2$ per year

[7] Census of Population, Central Statistics Office, 2006

[8] Chartered Institution of Building Services Engineers (CIBSE's) 'Energy Efficiency in Buildings' (Guide F, 2005).

[9] Valuation Office, Assessment of Rateable Floorspace for South Dublin, up to end of 2006

[10] SEAI 'Energy Balance, 2006'

[11] Millward Brown IMS & Faber Maunsell|AECOM 'Greater Dublin Area Household Survey March – July 2006' (2006)

[12] Design Manual for Roads and Bridges', UK Department for Transport: http://www.dft.gov.uk/ha/standards/dmrb/index.htm

[13] http://www.luas.ie/detailed-information.html

[14] http://www.luas.ie/detailed-information.html

[15] Email correspondence with Dublin Bus representative on 25th November 2010

[16] 'Conversion factors are from the 'Energy and carbon conversions - 2010 update' Carbon Trust - http://www.carbontrust.co.uk/publications/pages/publicationdetail.aspx?id=CTL113

[17] Telephone communication with Irish Rail representative on 5th February 2011

[18] Environmental Protection Agency's 'Carbon CMT Calculator Emission Factor Sources' - http://cmt.epa.ie/Global/CMT/emission_factor_sources.pdf

[19] 'Conversion factors are from the 'Energy and carbon conversions - 2010 update' Carbon Trust - http://www.carbontrust.co.uk/publications/pages/publicationdetail.aspx?id=CTL113

[20] UK Department of Energy & Climate Change & Department for Environment, Food & Rural Affairs 'Conversion Factors for Company Reporting' - http://archive.defra.gov.uk/environment/business/reporting/pdf/20090928-guidelines-ghg-conversion-factors.pdf

[21] Total energy consumption is expressed as KWh of energy usage per year. A Watt is the standard unit of electrical power, 1,000 Watts is called a kilowatt (kW) and 10^{12} Watts is a TWh.

[22] Total CO^2 emissions refers to $kgCO^2$ emitted per year. $kgCO^2$ refers to 1,000g of CO^2 per year, while Ktonnes refers to 1,000,000 $kgCO^2$ per year.

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South Dublin County Council

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Appendix B
NEEAP/NREAP
Scenario Measures

Energy Efficiency

- SEAI Public Sector Building Demonstration Projects
- Non-Residential Building Regulations 2005
- ReHeat (Renewable heat incentives in the services sector)
- SEAI Large Industry programmes
- Residential Building Regulations 2002
- SEAI Warmer Homes Scheme
- SEAI Greener Homes Scheme (efficiency gains)
- SEAI Public Sector Programme
- Green Public Procurement (via the Accelerated Capital Allowance Scheme (ACA))
- Supports for Exemplar Energy Efficiency Projects (SEEEP) and Energy Efficiency Retrofit Fund (EERF) public and commercial sector grants
- SEAI Small Business (SME) Supports
- Accelerated Capital Allowance Scheme (services sector)
- Residential Building Regulations 2008
- Efficient Boiler Standards
- Domestic lighting efficiency gains (Eco-Design Directive)
- SEAI Home Energy Saving scheme
- VRT/motor tax changes
- Improved economy of private-car fleet (by EU regulation)
- Aviation efficiency
- Public transport efficiency
- Better Energy Workplaces (services sector)
- Residential Building Regulations 2011

- Nearly zero energy dwellings (a further revision to the Residential Building Regulations in 2016)
- Building Regulations 2012 – Buildings other than dwellings
- Smart meter roll-out
- Better Energy Homes
- Electric vehicle deployment
- More efficient road traffic movements

Renewable Energy

The NEEAP/NREAP scenario applies the methodology used in the production of Ireland's NREAP. The NREAP outlines the minimum response required from the various policy measures in order to achieve the Renewable Energy

Directive (28/EC/2009) obligations of:

- 16% of total energy consumption from renewable sources by 2020 (RES-16%)
- 10% of consumption in the transport sector from renewable sources by 2020 (RES-10%24)

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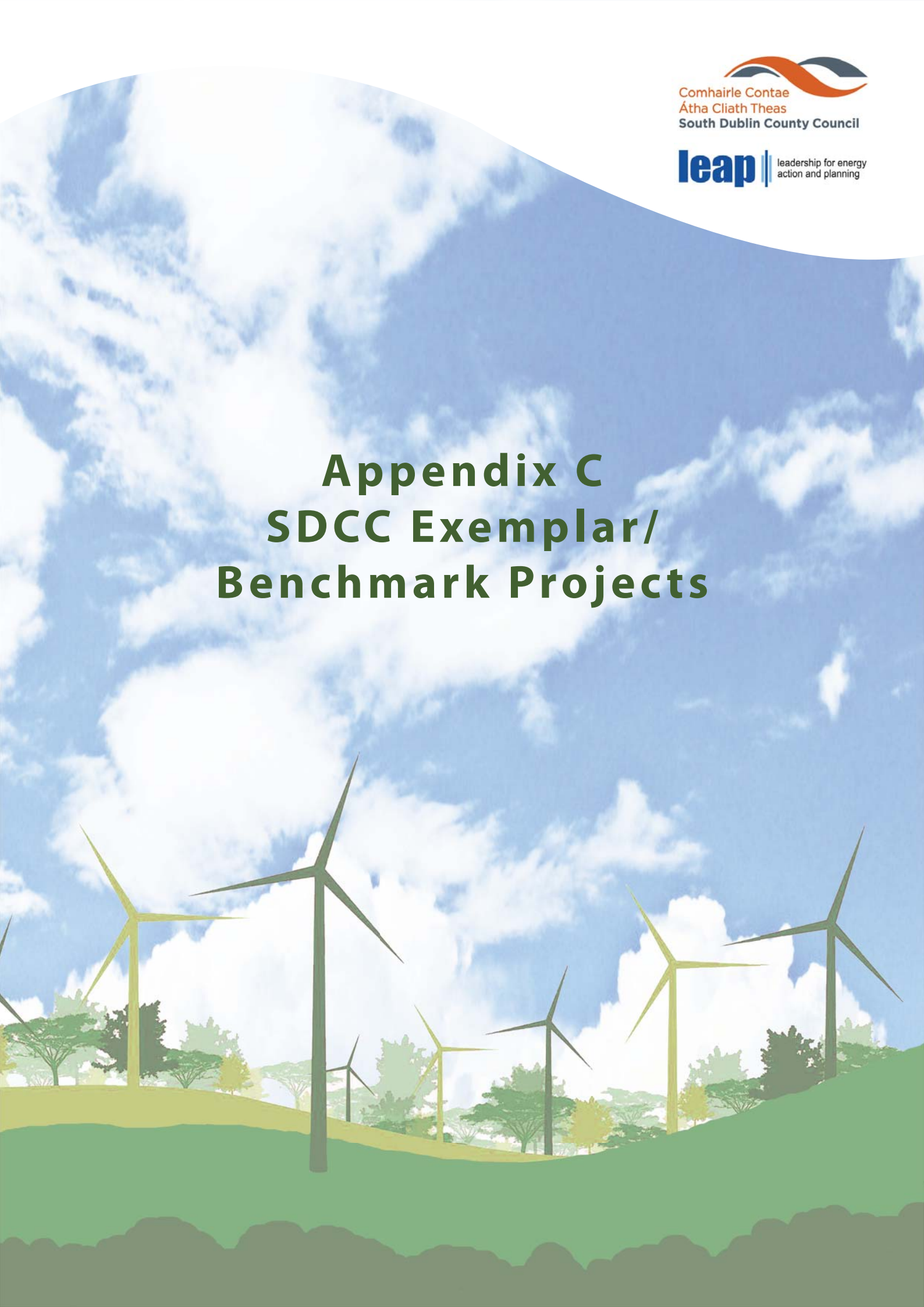
Appendix C
SDCC Exemplar/ Benchmark Projects



ENERGY PROJECT

TALLAGHT LEISURE CENTRE

TALLAGHT LEISURE CENTRE MAIN ENTRANCE

OUTLINE OF DESIGN

- Quality in design.
- Combined heat and power plant (CHP).
- Under floor heating system.
- Window design.
- Ventilation and Daylight.
- Heat recovery
- Energy saving light sources.
- Rainwater Harvesting System

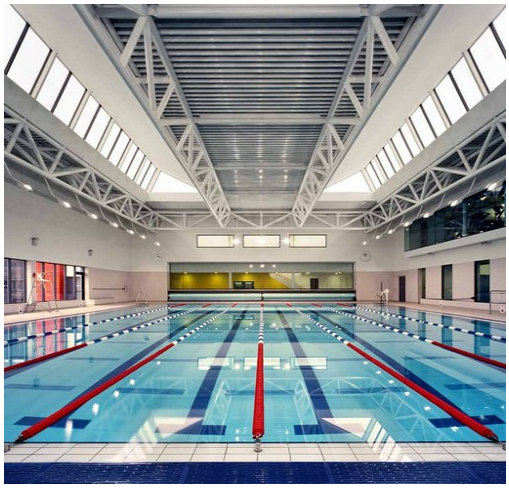
Concept Description:

West Tallaght Pool was designed from the outset with sustainability in mind. Swimming pools operate at an internal temperature of 28 – 30oC and they loose heat to the external air all year around. Insulation levels were increased beyond that demanded by the then current building regulations. As a swimming pool needs heat and hot water for showers all year around a combined heat and power plant (CHP) was introduced, supplying 110kW electricity and 170kW heat. This is a gas powered turbine which generates electricity. The waste heat produced in the process is harnessed and used in the building. In this way the efficiency of electricity generation is double that of electricity generated and delivered through the national grid.

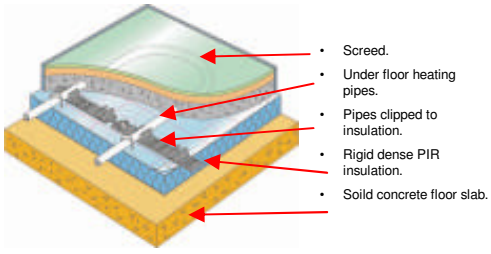
As a further means of saving heat, high efficiency heat exchangers were installed in the pool air handling plant. The heat exchanger takes heat from the exhaust air via a plate heat exchanger and uses it to heat up the incoming fresh air.

Passive infra red movement detectors and daylight sensors are used to dim or switch off lighting when spaces are unoccupied or when daylight levels are adequate. The pool hall has high level roof lights designed to minimise glare on the pool surface whilst maximising daylight. The sports hall is lit by clerestory glazing which also acts to naturally ventilate the space.

Rainwater is collected from the building and is used for backwash cleaning of the pool hall filters at regular intervals. Other efficiency measures such as variable speed drives for the pumps and fans, low energy lighting throughout and condensing boilers for use with under floor heating in the changing rooms all ensure that the building will deliver its remit as a best practice example of sports facility design.



POOL HALL



TYPICAL SOLID FLOOR WITH UNDER FLOOR HEATING

NATURAL LIGHT & VENTILATION TO SPORTS HALL

CHP related savings

Annual Cost Savings= €19,166.5/Annum

Primary Energy Savings= 440,318.9kWh/Annum

Absolute CO2 savings = 239.5tonnesCO2/Annum

ENERGY PROJECT

ST MARKS YOUTH & FAMILY FACILITY

PROJECT IMAGE

OUTLINE OF DESIGN

- Environmental, Social and Economic.
- Robust glulam structure.
- Energy efficiency and passive design strategy.
- Space Heating by Biomass Boiler.
- Window design triple glazing.
- Ventilation and Daylight.
- Rainwater Harvesting System.
- Landscaping.

Project Description:

This project consists of the extension and refurbishment of the existing St. Marks Community Facility, an urban farm, in Fettercairn. The focus of the project was to create flexible spaces that have healthy levels of natural light and ventilation, utilising the site to create a cohesive link between it, the existing farm and St. Mark's House. The building accommodates the offices of the Childhood Development Initiative and facilities for the centre including meeting rooms, a large dance studio/ band rehearsal area, social room, a dark room and a multi-purpose room with catering facilities for grinds and breakfast clubs.

The main entrance is along a pedestrian walk linking the refurbished centre and CDI offices with the urban farm and the existing 19th century house. The existing hall building has been clad with sustainable and recyclable materials such as timber and zinc. The roof has been raised to provide natural ventilation and daylight to the central areas. Rainwater from the roof has been harvested to flush the toilets. A wood pellet boiler has been installed to provide heating and hot water to all the buildings on the site. The building fabric of the new extension is highly insulated and airtight. Low emissivity glass has been used throughout and triple glazing has been used on the north facing windows. The main roof structure is made up of glulam timber beams and purlins, sourced from managed forests.

PROJECT IMAGE

BIOMASS WOOD PELLET BOILER

Space Heating by Biomass Boiler:

A biomass fuelled system offers a clean, highly efficient alternative to fossil fuel burning systems. A wood pellet storage unit is located adjacent to the boiler house in the yard and away from the main building. Carbon savings attributable to this technology are significant. A low pressure hot water (LPHW) system was provided throughout the entire building to serve thermostatically controlled radiators in all areas. Individual occupant control is provided in all rooms by thermostatic radiator values (TRV's). The existing 19th century house is also served by the biomass boiler.

PROJECT IMAGE

SDCC HOUSING REFURBISHMENT PROGRAMME

REPLACEMENT OF WINDOWS/DOORS

Concept Description:
Since it's formation in 1994, South Dublin County Council has been committed to the continued energy upgrade and refurbishment of its housing stock. The 'Community Enterprise Cavity wall and attic insulation Programme' upgraded 4860 houses up to 2008. The 'window replacement Programme' has changed single glazed windows to double glazed in 1200 dwellings since 2006. The 'Accelerated gas fired central heating Programme' installed 2715 new central heating systems between 2006 and 2009. All these programmes brought the older pre 1990 housing stock, up to a comfortable living standard.

In addition to these programmes, the extensive SDCC Refurbishment Works Programme which has been rolled out in phases since 2000 will have fully upgraded 983 houses by the end of 2013. As part of this programme, Cushlawn Phase 3 which started on site in May 2011 and reached substantial completion in December 2011 upgraded 75 dwellings. The works carried out included wall and attic insulation, a full electrical and heating system upgrade, replacement windows and doors, draftproofing and airtightness works and miscellaneous repairs internally and externally. Before and after BER ratings were done. Before the works were carried out 75% had a BER of D1 or less. After the works were complete 73% had achieved a BER of B3 or better and 24% had achieved a BER of B2. This represents an average of 37% reduction in energy consumption which represents a significant improvement in these older dwellings and has a direct benefit to tenants in relation to their energy costs and an improved quality of life.

OUTLINE OF ENERGY EFFICIENCY WORKS

- New cavity wall insulation.
- Additional attic insulation.
- Installation of gas central heating and immersion.
- Hot water cylinders upgraded to factory insulated.
- Replacement windows and doors.
- Air tightness works.
- Low energy light bulbs fitted.

BER rating	BER pre upgrade		BER post upgrade	
B2			18	73%
B3			37	
C1	1		19	
C2	2		1	
C3	16			
D1	16	75%		
D2	18			
E1	13			
E2	6			
F	3			
Total no of houses	75		75	

Total amount of energy saved in 75 houses = 10,583 kWh/m2/year

CUSHLAWN ESTATE
BEFORE

CUSHLAWN ESTATE
AFTER

ENERGY PROJECT

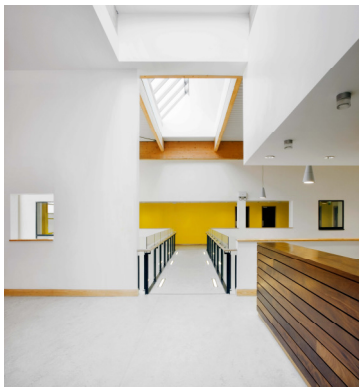
CLONDALKIN LEISURE CENTRE

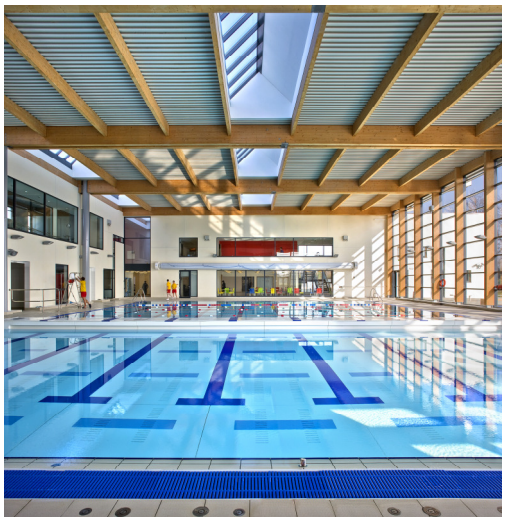
PROJECT IMAGE

OUTLINE OF DESIGN

- Energy efficient design strategy.
- Quality in design.
- Evacuated tube solar panels have been fitted to provide pool water heating.
- Sustainable glulam structure.
- Window design optimising daylight.
- Heat recovery.
- Rainwater Harvesting System.
- Energy efficient light sources.

Description:
The extension to and refurbishment of the existing Leisure Centre was completed in January 2008. The new extension contains a 25M x 17M swimming pool, changing village, café, viewing gallery, gym studios and ancillary accommodation. The existing Sports Hall building refurbished and remodelled.
There is an important visual link between all the elements of the centre, which gives a strong dynamic to the internal spaces. The framed views constantly remind the user of the parkland setting of the building.
The three large masts which support the roof are clearly visible on the approach to the building and support a structure that is elegant, and yet strong enough to span the 24M wide pool hall.
The entrance to the building is through a double height foyer which acts as a link at ground and first floor level between the old and new.
The robust glulam structure and high levels of natural light provide a pleasant environment which also reduces the amount of artificial lighting required.
Evacuated tube solar panels provide pool water heating. Rain water is collected and recycled. The new extension has been super insulated and low emissivity glazing has been used.





POOL HALL

SOLAR PANELS:
A 108sqM array of evacuated tube solar panels has been fitted to provide 50% pool water heating. Evacuated tube panels were chosen over flat plate collectors because of their improved performance in diffuse/indirect sunlight. The pool water heating is backed up by the main gas fired boiler system. Air to air heat exchangers are utilised in Pool and Changing Village Air Handling Units.

EVACUATED TUBE
SOLAR PANELS

WARMER HOMES
AREA BASED / LOW INCOME PILOT
BROOKVIEW ESTATE

OUTLINE OF ENERGY EFFICIENCY WORKS

- New cavity wall insulation.
- Additional attic insulation.
- Upgrading of Central heating.
- Lagging to hot water cylinder.
- Replacement windows where identified by Retrofit Energy Ireland Ltd (REIL).
- Draught proofing.
- Ventilation.

BONDED BEAD CAVITY WALL INSULATION SYSTEM

ADDITIONAL ATTIC INSULATION

Concept Description:
The Area Based Pilot Project 2012 – 'Delivering Energy Efficiency Improvements to Low Income Housing' was initiated by the SEAI.
SDCC partnered Retrofit Energy Ireland Ltd (REIL), Energy Action and IHER (Irish Homes Energy Rating), in the bid to SEAI for funding for the above Pilot Project to a cluster of public and private houses in Brookview Grove and Brookview Green, Tallaght. The grant Application was made in July 2012.

Retrofit Energy Ireland Ltd (REIL) is the Lead Applicant for the project and the Project Co-Ordinator. Derchil Ltd is the Main Contractor who carried out the works. Energy Action is carrying out the Energy awareness programme for the householders involved and the attic insulation / draught proofing elements of the project.
IHER is carrying out the Energy rating exercises for each house.
SEAI subsequently approved funding in late August of €159,795 to REIL, for 48 dwellings. And SEAI set 15thNovember as the Project Completion date for the works. SEAI funding covers 80% of the overall costs and applies to fuel poor homes public and private. SDCC agreed to fund 18% of the cost of the work to the SDCC homes- i.e those SDCC dwellings that are not fuel poor. This amounts to €35,641.00 excl vat.
Fuel-poor are defined as receiving:
Jobseekers Allowance (with one child at least under 7 years of age)
Family Income Supplement
Fuel Allowance

Warmer Homes Scheme Area Based Pilot – Energy & CO2 Savings

Total Number Of Houses Upgraded 43	Pre Grant Energy Estimate- Primary Energy Value kWH/m2/yr	Pre Grant Energy Estimate- CO2 Emissions Value Value (kg/m2/yr)	Post Grant BER Energy- Primary Energy Value (KwH/m2/yr)	Post Grant BER Energy- CO2 Emissions Value Value (kg/m2/yr)	BER Energy- Primary Energy Value Saved (KwH/m2/yr)	Energy Estimate- CO2 Emissions Value Saved (kg/m2/yr)
Average	293.75	59.9	161.9	33.34	131.8	26.6
Total	12631.29	2575.96	6963.37	1433.49	5667.92	1142.47

ANNUAL ENERGY SAVINGS ASSOCIATED WITH THIS SCHEME

ENERGY PROJECT

BALLYROAN LIBRARY

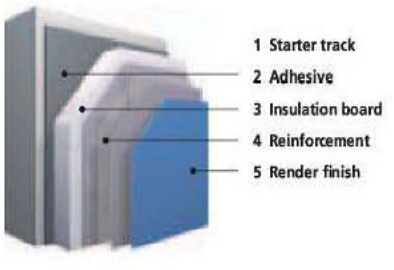
PROJECT IMAGE

OUTLINE OF DESIGN

- Geo thermal under floor heating system
- Energy efficiency and passive design strategy.
- Quality in design
- Passiv-haus standard Window design
- Ventilation and Daylight.
- Air tightness.
- External insulation system.

Description:
The old library was built in the 1980's but had become outdated and too small for the number of people that use the library which has one of the highest user rates in the greater Dublin area. It proved more cost effective to demolish the existing and build a brand new purpose built A rated building.
One enters into a new double height internal street. This street will be used for group activities, large exhibitions, readings, meetings, lectures etc. and can adjust as needs change.
An exhibition area and a large seminar room which can be divided into two separate rooms are included in the two storey volume on the east side and these are denoted in a timber lining which snakes in and out of these areas and can be opened and closed to adapt to the user needs. A study area is provided on the first floor as well as book storage and staff facilities.
The large open plan reading room is lit from above by means of roof-lights with more intimate reading areas off the main space in the form of pods, which overlook the adjoining streets. These can be a place to study or sit and read. A children/group area is located on the south and can be used for book readings, arts and crafts etc.
The car park has been remodelled to become a shared surface for people and cars. This area has been planted with trees and benches to allow one sit and read.

EXTERNAL INSULATION INSTALLATION



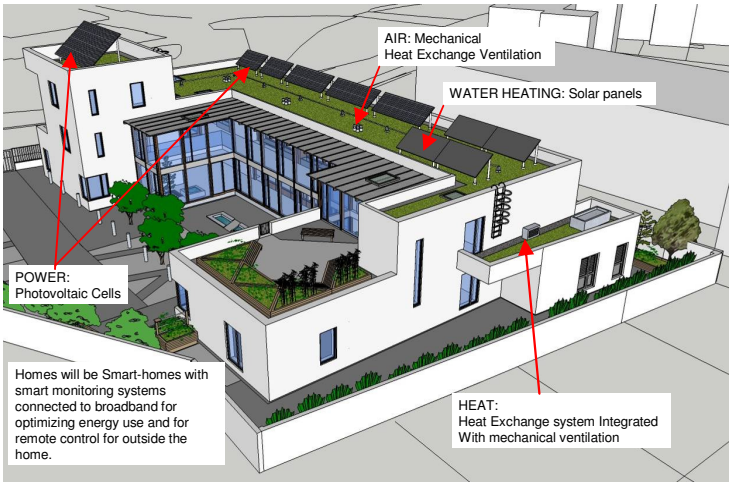
EXTERNAL INSULATION SYSTEM

PROJECT IMAGE

ENERGY PROJECT

VALHALLA
SHELTERED HOUSING PROJECT

Design Technologies



OUTLINE OF DESIGN

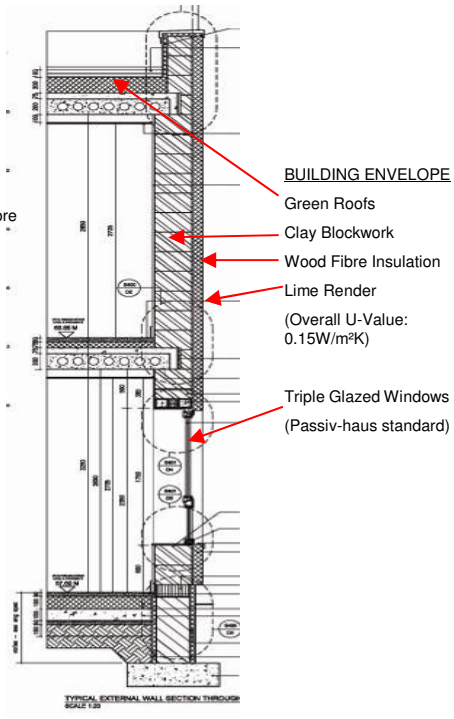
- Sustainable materials and building envelope.
- Energy efficient technologies.
- High quality design successfully integrating principles of sustainability and social integration.
- To harness new technologies and access systems.
- Tenants with range of physical capabilities.
- Environmentally sustainable built forms and systems.
- Lifetime standard homes.
- Towards carbon neutral and passiv-haus standard

Project Description:
The purpose of the proposed development is to provide fully accessible living accommodation for up to 23 persons with varying levels of physical disability close to the amenities and public transport of Clondalkin Village and to enhance the quality of the built environment along Watery Lane.The intention of the design is to create a modern building which is responsive to its site and is socially and economically sustainable. To ensure the optimisation of this brown field site and land in general as a valuable and finite resource and to make a contribution to townscape in the making and repair of the street.
The project offers the particular opportunity to achieve best practice in the provision of Special Needs and Lifetime Homes. Providing the opportunity for independent living for people with special physical needs through fully accessible dwellings with own door access, enjoying the advantages of grouping in terms of cost-effectiveness and the servicing of medical and training needs.
To provide a pilot project within the county in the provision of sustainable/passive apartment dwellings.
A standard dwelling complying with Part L of Building regulations should achieve a B1 rating. These dwellings are rated at A2. This represents a carbon and CO2 saving of 2.3 tonnes and 6562.5kWh per dwelling.


VIEW FROM SOUTH WEST CORNER


VIEW FROM NORTH WEST CORNER

Renewable Energy	Capacity (kW)	Total (kWh)
3no. Air source Heat Pumps	3x14kw	19162.5
Solar Thermal	150w/m2x16.48m2x24hrx365day	21654.7
Solar photovoltaic	-	1044
Total		**41861.2**



Design: Materials

SUMMARY OF REFURBISHMENT WORKS – FEBRUARY 2013

Community-Enterprise Energy-upgrade Programme (attic insulation / draught-proofing / lagging	3,000	1999 - 2004
Community-Enterprise Energy-upgrade Programme (wall-insulation)	1,860	2005-2008
Accelerated Gas-Fired Central Heating Programme	2,000	Completed 2006
Replacement of tenant-installed gas and oil-fired central heating systems programme	715	Commenced 2007 and ongoing
Window and door replacement and upgrade (Pilot Programme)	650	Completed 2009
Window and door replacement and upgrade Maintenance Programme	550	2010 -2012
Energy-Refurbishment Pilot – Donomore (insulation / window replacement/ gas-fired heating)	241	2000 - 2001
Refurbishment (Phase 1) – Cushlawn Greenfort / Shancastle / Moorfield	325	2004 – 2004
Refurbishment (Phase 2) – Cushlawn / Greenfort / Shancastle	191	2007 – 2009
Refurbishment (Phase 3) – Cushlawn / Greenfort / Shancastle This phase to bring dwellings to minimum C1	149	2011 – 2013
Refurbishment of Pearse Brothers Park / Palmer Park Apartments to be minimum C2	22	2011 – 2013
Energy-Upgrade Relet Programme	217	2009 – 2013
SEAI Area-Based / Fuel Poverty (Warmer Homes) Programme	49	2012
Tara Hill (external insulation) Programme	6	2012

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Appendix D
Covenant of Mayors
SEAP Template

Overall Strategy

1. Overall CO_2 Emissions Target

- 20% by 2020

2. Long-term vision of your local authority (please include priority areas of action, main trends and challenges)

Since its establishment, South Dublin County Council has endeavoured to promote a more sustainable development pattern. The Council has a strong track record in carrying out energy efficiency programmes and refurbishment projects, energy awareness and has developed a strong energy policy structure. The Council is committed to acting as a focal point for the reduction of energy usage and the growth of renewable energy technologies and strategies in South Dublin County.

To consolidate its efforts, ensure SEAP delivery and to empower change at the local level, SDCC has set up energy action groups comprising multi-disciplinary staff from across the organisation. SDCC acknowledges that reversing current energy trends across all sectors, is a challenging task and requires wide stakeholder and citizen involvement campaigns, in conjunction with infrastructural and building improvements.

In response to this challenge, the South Dublin SEAP sets out a range of actions in areas that SDCC has influence on / control over, structured under the SEAP principles of Record, Reduce and Replace. SDCC recognises its first SEAP as a robust starting point, in addressing the energy challenge at a local level, to 2020 and beyond.

3. Organisational and financial aspects

Co-ordination and organisational structures created/assigned

SDCC has set up a SEAP Co-Ordination Group, chaired by an 'Energy Champion' at senior management level. The group comprises an inter-disciplinary team of SDCC staff; wider members of the team include staff from CODEMA and SEAI. Through involvement in the EU IEE funded LEAP programme, input is also received from the Town and Country Planning Association (TCPA), Southampton City Council and other EU local authorities.

Staff capacity allocated

Two full time equivalent South Dublin County Council staff are involved in drafting the SEAP, along with additional input from senior staff at SDCC.

Involvement of stakeholders and citizens

As part of the SEAP development process, SDCC staff, businesses, homeowners, schools, community groups, providers of energy goods and services and other stakeholders have been involved through exhibitions, workshops, video, internet and social media. This interaction culminated in a week long 'Connect with Energy' initiative which took place in June 2012. Further information on this initiative is available at www.southdublinenergy.ie.

The Draft South Dublin Sustainable Energy Action Plan was on public display from 21st February 2013 for a six week period. A total of five submissions were received and a Managers Report was prepared summarising and responding to these submissions. No amendments to the Draft South Dublin SEAP document were made following the public consultation process.

Overall estimated budget

Approximately €200,000 per year for organisational aspects of SEAP.
Annual budgets across the Institutional / Commercial, Residential / Community and Land Use Planning / Transport Actions Groups to be determined, based on national and other funding sources secured on an annual basis.

Foreseen financing sources for the investments within your Action Plan

Potential further national funding from Department of Transport, Tourism & Sport, National Transport Authority and Department of the Environment, Community & Local Government. Potential EU funding could also be sourced across the Action Group areas, from the sources detailed in Chapter 7.

Planned measures for monitoring and follow up

SDCC will monitor SEAP actions and update the Baseline Emissions Inventory on an annual basis. Results will be reported to the SEAP Co-Ordination Group and the Covenant of Mayors Office. An implementation report will also be submitted to the Covenant of Mayors Office on an annual basis following the submission of the SEAP for verification.

Baseline Emission Inventory

1. Inventory Year

- 2006

2. Emission factors

- Standard emissions factors in line with IPCC principles

Emissions reporting unit:

- CO_2 emissions

3. Key results of the Baseline Emissions Inventory

A. Final Energy Consumption

Category	FINAL ENERGY CONSUMPTION [MWh]															
			Fossil fuels								Renewable energies					
	Electricity	Heat/cold	Natural gas	Liquid gas	Heating Oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	Total
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:																
Municipal buildings, equipment/facilities	9000		9000													**18000**
Tertiary (non municipal) buildings, equipment/facilities	367287		164086		344002				14061							**889436**
Residential buildings	352845		730311		194855				10533	27648						**1316587**
Municipal public lighting	15000															**15000**
Industries (excluding industries involved in the EU Emission trading scheme - ETS)	652164		334035		540819				63625							**1590645**
Subtotal buildings, equipments/facilities and industries	1396296		1237432		1079676				88219	27648						**3829666**
TRANSPORT:																
Municipal fleet						11760	2100					140				**14000**
Public transport	3000					170000										**173000**
Private and commercial transport						2384000	429000									**2813000**
Subtotal transport	3000					2565760	431100					140				**3000000**
Total	**1399296**		**1237432**		**1079676**	**2565760**	**431100**		**88219**	**27648**		**140**				**6829666**

Municipal purchases of certified green electricity (if any) **[MWh]:**	
CO2 emission factor for certified green electricity purchases (for LCA approach)**:**	

B. CO_2 emissions

Category	CO2 emissions [t]/ CO2 equivalent emissions [t]															
	Electricity	Heat/cold	Fossil fuels								Renewable energies					Total
			Natural gas	Liquid gas	Heating Oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biofuel	Plant oil	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:																
Municipal buildings, equipment/facilities	4796		1656													6452
Tertiary (non municipal) buildings, equipement/facilities	222015		33756		103306				5062							364139
Residential buildings	298886		207187		81503				5340	13958						606874
Municipal public lighting	8300															8300
Industries (excluding industries involved in the EU Emission trading scheme - ETS)	395870		68861		162692				22823							650246
Subtotal buildings, equipments/facilities and industries	929867		311460		347501				33225	13958						1636011
TRANSPORT:																
Municipal fleet						3010	508									3518
Public transport	2200					43000										45200
Private and commercial transport						601820	106480									708300
Subtotal transport	2200					647830	106988									757018
OTHER:																
Waste management																
Waste water management																
Please specify here your other emissions																
Total	**932067**		**311460**		**347501**	**647830**	**106988**		**33225**	**13958**						**2393029**

Corresponding CO2-emission factors in [t/MWh]																
CO2 emission factor for electricity not produced locally [t/MWh]																

Sustainable Energy Action Plan

1. Title of your Sustainable Energy Action Plan

- South Dublin Sustainable Energy Action Plan 2013 – 2020

Date of formal approval

- Monday 13th May 2013.

2. Timescale

- From 2013 To 2020+

3. Key elements of your Sustainable Energy Action Plan

Record Actions

Action Ref	Action Title	Responsible Department	Implementation Start / End Time	Status: Complete, Ongoing, Planned
REC1	Recording and measuring SDCC large energy users in building stock, public lighting, fleet, drainage and water management	Architectural Services Department, Environmental Services Department, Roads & Water Services Department, Development, Economic & Transport Planning Department, Corporate Services Department, SDCC	2011 - 2020	O
REC2	Identifying Energy Performance Indicators	Architectural Services Department, Development, Economic & Transport Planning Department, Environmental Services Department, Roads & Water Services Department, Community Services Department, SDCC	2013 - 2020	P
REC3	Using Sustainable Energy Community (SEC) network to evaluate performance of and share knowledge gained through energy efficiency projects	Architectural Services Department, Development, Economic & Transport Planning Department, SDCC	2011 - 2015	O

REC4	Develop a Heat Mapping Tool to geographically represent energy data for buildings across all sectors	Spatial Data Unit, Development, Economic & Transport Planning Department, Architectural Services Department, SDCC	2013 - 2020	P
REC5	Collection & Analysis of Building Energy Rating (BER) Data	Architectural Services Department, Development, Economic & Transport Planning Department, SDCC	2012 - 2020	O

Reduce Actions

Action Ref	Action Title	Responsible Department	Implementation Start / End Time	Status: Complete, Ongoing, Planned
RED1	Continue engagement with Energy MAP Programme and prepare an Energy Efficiency Action Plan for SDCC, identifying efficiency measures for large energy users in building stock, public lighting, fleet, drainage and water management	Architectural Services Department, Development, Economic & Transport Planning Department, Environmental Services Department, Roads & Water Services Department, Corporate Services Department, Community Services Department, SDCC	2011-2020	O
RED2	Improving efficiencies through South Dublin County Council Energy Awareness campaigns for staff and politicians	Development, Economic & Transport Planning Department, Environmental Services Department, Architectural Services Department, Corporate Services Department, SDCC	2013-2020	P
RED3	Awareness Raising & Local Networking	Development, Economic & Transport Planning Department, Environmental Services Department, Corporate Services Department, Community Services Department, SDCC	2013-2020	P
RED4	Continuing refurbishment of housing stock across South Dublin County through involvement in schemes such as the 'Warmer Homes Pilot Project'	Architectural Services Department, SDCC	1999-2020	O
RED5	Continuing energy upgrade of other SDCC owned and operated building stock	Architectural Services Department, SDCC	2011-2020	O
RED6	Continuing energy upgrade of public lighting and develop pilot projects in this area	Roads & Water Services Department, Public Lighting, SDCC	2012-2020	O
RED7	Continuing energy upgrade of drainage and water distribution network and develop pilot projects in this area	Environmental Services Department, SDCC	2012-2020	O

RED8	Improvements in fuel efficiency in fleet and develop pilot projects in this area	Environmental Services Department, SDCC	2012-2020	O
RED9	SME Energy Initiative	South Dublin Chamber of Commerce, Architectural Services Department, Development, Economic & Transport Planning Department, SDCC,	2012-2020	O
RED10	Develop Business Energy Networks	South Dublin Chamber of Commerce, Architectural Services Department, Development, Economic & Transport Planning Department, SDCC,	2013-2020	P
RED11	Schools Energy Initiative	Development, Economic & Transport Planning Department, Environmental Services Department, SDCC	2013-2020	P
RED12	Continue the development of sustainable communities policy based on the integration of land use and transport planning	Development, Economic & Transport Planning Department, Architectural Services Department, Road & Water Services Department, SDCC	2000-2020	O
RED13	Personalised Travel Planning projects in South Dublin County	Development, Economic & Transport Planning Department, SDCC	2009-2020	O
RED14	Local Permeability Projects	Development, Economic & Transport Planning Department, Environmental Services Department, Roads & Water Services Department, SDCC	2012-2020	O
RED15	Design Manual for Urban Roads and Streets (DMURS)	Development, Economic & Transport Planning Department, SDCC	2012-2020	O
RED16	Cycle routes/networks in South Dublin County	Development, Economic & Transport Planning Department, Roads & Water Services Department, SDCC	2012-2020	O
RED17	Work Place Travel Plans	Roads & Water Services Department, SDCC	2013-2020	P
RED18	Electric Vehicles	Roads & Water Services Department, SDCC	2013-2020	P

Replace Actions

Action Ref	Action Title	Responsible Department	Implementation Start / End Time	Status: Complete, Ongoing, Planned
REP1	Prepare a Local Authority Renewable Energy Strategy (LARES)	Development, Economic & Transport Planning Department, SDCC	2013-2020	P

REP2	Pilot renewable energy measures testing renewable technologies and improved fabric measures as part of major new build capital projects	Architectural Services Department, SDCC	2011-2020	O
REP3	Feasibility Projects to assess large scale renewable and low carbon technologies/strategies	Architectural Services Department, Development, Economic & Transport Planning Department, Environmental Services Department, SDCC	2012-2020	O
REP4	Renewable Energy Feasibility Studies in conjunction with Institute of Technology Tallaght	Architectural Services Department, Development, Economic & Transport Planning Department, SDCC,	2013-2020	P

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

leap leadership for energy action and planning

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