



European Regional Development Fund



Introduction

South Dublin County Council has an established track record in participating in and delivering European projects, including the Leadership for Energy Action and Planning and the Spatial Planning and Energy for Communities in all Landscapes projects, which were funded by the EU Intelligent Energy Europe programme and involved partnership with other local authorities across Europe and the Covenant of Mayors initiative.

What is HeatNet?

In partnership with City of Dublin Energy Management Agency (CODEMA), the Council is now leading a project to develop South Dublin County's first public district-heating network. With partners across 5 EU states, the HeatNet project will link SDCC County Hall complex to local institutional / commercial buildings in Tallaght town centre, to form the core of a district-heating network which when operational is expected to save the Council almost 1,900 tonnes CO₂ per year after 5 years. Heatnet will run until 2020 and will receive European Regional Development Funding through the INTERREG North West Europe 5B programme.

HeatNet Partnership

The HeatNet project partners are:

Partners	
1	CODEMA, Ireland (Lead Partner)
2	Plymouth City Council, UK
3	Aberdeen City Council, UK
4	Stad Kortrijk, Belgium
5	Mijnwater B.V. Heerlen, Netherlands
6	Hogeschool van Amsterdam, Netherlands
7	Ville de Boulogne-sur-Mer, France
8	South Dublin County Council, Ireland
9	CAP 2020 asbl, Belgium
10	Intercommunale Leiedal, Belgium
11	Energy Cities, France
12	Universiteit Gent, Belgium
13	Les 7 Vents, France
14	CEREMA, France

District- heating utilises waste-heat from sources such as electricity generation through a network of insulated pipes typically providing space heating and hot water to residential and

commercial buildings, far more sustainably and economically than traditional methods using individual gas or oil boilers. A fourth generation district heating scheme could generate heat for SDCC and other local developments / businesses in the longer term, reducing costs and carbon and guaranteeing energy resilience into the future. There will be ongoing potential for energy savings for other businesses and buildings in the area as the heating network rolls out and Tallaght becomes a model for Community energy and a decarbonised town centre.

HeatNet officially began in 2016 and the successful project partner meetings took place in Heerlen, Netherlands in February 2017 and Boulogne-sur-Mer, France in September 2017. This incorporated workshops and study tours, and partners started to share experiences on good practice in developing local district heating infrastructure according to its various benefits. Further details of the HeatNet project are available on the CODEMA website.



Evidence based planning for climate change mitigation in South Dublin County

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Foreword

As the heart of local democracy and with responsibility for land-use planning, housing, employment, transport and environmental efficiency, local authorities are widely recognised as leaders in the efforts to address the climate change challenge. In collaboration with stakeholders ranging from local to European level, South Dublin County Council has responded by aiming to prioritise and unlock low-carbon technologies and renewable energy opportunities. SDCC projects and initiatives range from capacity building in energy awareness and action, to spatial data-collection and mapping of energy demand and supply through to on the ground projects in district heating, renewable generation and building energy efficiency programs. The South Dublin Spatial Energy Demand Analysis has informed energy masterplans underpinning the sustainable development of new residential and industrial centres, such as the Clonburris Strategic Development Zone (SDZ) and the further development of Grange Castle Business Park. In recognition of its efforts South Dublin County Council was presented with the 'Planning for Climate Change' award at the Irish Planning Institute National Planning Awards 2016 and was shortlisted in the European Urban and Regional Planning Awards 2016.

The opportunity to integrate energy and spatial planning

In consideration of EU wide energy targets to 2030 and beyond, Planners in local authorities are best positioned to aid the transition to a low carbon society, by integrating climate change mitigation and sustainable energy systems into spatial planning tools and strategies, thereby embedding this additional thematic layer in the spatial plan making process. For South Dublin

County Council key objectives of advancing this evidence based policy approach will be:

- To develop a closer link between European and National energy policy and spatial planning for energy and climate change mitigation and to support the EU Covenant of Mayors initiative by advancing Sustainable Energy Action Plan (SEAP) methodologies in Europe;
- To stimulate the development of a regional methodology for spatial energy demand analysis, energy mapping and energy planning policy development;
- To educate local authorities, public and private sector organisations and energy stakeholders on energy responses that are most relevant at the local level and base energy planning policies and objectives on a robust spatial understanding of the existing and future energy profiles across sectors at a local authority scale;
- To encourage greater local authority involvement and leadership in the roll out of balanced renewable energy sources and systems and encourage community-owned energy initiatives; and
- To promote the generation and supply of low carbon and renewable energy alternatives, having regard to the opportunities offered by the settlement hierarchy of a local authority / municipality area, the variety of land uses present and the built environment.

The South Dublin Spatial Energy Demand Analysis (SEDA)

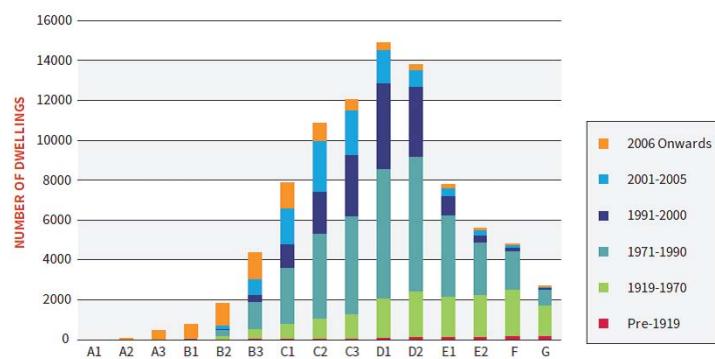
To frame and embed robust policies in the South Dublin County Council Development Plan 2016-2022, the EU Covenant of Mayors and South Dublin Sustainable Energy Action Plan (SEAP) data and methodologies were incorporated in a spatially geographic manner. The Central Statistics Office (CSO) Small Areas were used as geographical boundaries to represent the County's energy profile, resulting in an innovative detailed level of analysis, since refined for further studies and planning strategies.

The spatial energy demand mapping and heat density analysis undertaken for the South Dublin Spatial Energy Demand Analysis reveals that there is potential for the development of both decentralised, local district heating networks and also a range of on-site / in-house low carbon and renewable energy alternatives to address the energy needs of various sectors, in particular commercial and industrial uses. The

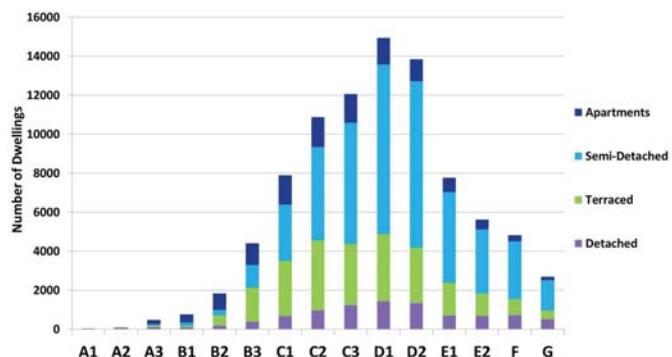
SEDA analysis of the residential sector reveals a diverse energy profile spanning homes built over the past one hundred years, in both urban and rural environments. The analysis of the residential sector indicates that approximately 56% of BERs in the County are D1 or lower. Furthermore, 66% of all semi-detached housing is rated D1 or lower, 46% of terraced dwellings and 60% of detached dwellings are rated D1 or lower (see Figure. 1). There are widespread opportunities and needs for domestic insulation upgrades offering investment, employment and carbon-saving dividends as well as obviating the risk of fuel-poverty for the less-advantaged in South Dublin County.

Through Sustainable Energy Action Plan / Covenant of Mayors methodologies, the SEDA Analysis also acted as the starting point for the development of a regional spatial approach to energy profiling expanding planning for renewable energy across local authority boundaries. Similar studies have since been carried out by the other Dublin local authorities, led by the City of Dublin Energy Management Agency (CODEMA).

Figure 1: South Dublin BER Information



South Dublin BER Distribution of dwellings by year built



South Dublin BER Distribution of dwellings by building type

The Clonburris Energy Masterplan

Into the future, the development of the Clonburris Strategic Development Zone (SDZ) lands offers potential for the establishment of a new sustainable energy community in South Dublin County. Its Energy Masterplan, prepared in conjunction with the SDZ Planning Scheme, is a strategic first step in the development of a co-ordinated energy response for a new residential and mixed-use district in the medium to long term. Building on the South Dublin Spatial Energy Demand Analysis, the key focus of the Clonburris Energy Masterplan, is to set out a range of options – including energy efficiency and renewable heating, cooling and electricity including energy-storage potential. The energy options available at Clonburris vary from ‘kick start’ local networks or district energy schemes, to more localised, block and individual building level opportunities (see Figure 3). Viability and economic analysis of a range of options are included in the Energy Masterplan to encourage commitment to a low-carbon approach from earliest design stages of new development.

A key factor determining the viability of a low carbon heat network at Clonburris, is the heat demand density across the area covered by the network. Heat demand density, measured in gigawatt hours per square kilometre (GWh/km²), is the amount of thermal energy used within a defined area and is an accepted European indicator for the economic viability of district heating schemes. The density and development mix at the proposed Clonburris and Kishogue urban centres, allows potential for local heat networks to emerge at these centres. The indicative location of the future energy hubs at Clonburris is shown in Figure 2. Given the residential density, variety and mix of land uses at these urban core locations, the economic viability of a heat network could be favourable, initially based on Gas Combined Heat and Power (CHP) or waste heat from operations at Grange Castle Business Park. The high thermal efficiency required in new buildings built to the Nearly Zero Energy Building (NZEB) standard upcoming in the Building Regulations, will offer carbon and cost savings in shared heat-networks and local heat and electricity will guarantee resilience into the future.

Figure 2: Potential heat energy hubs at Clonburris SDZ

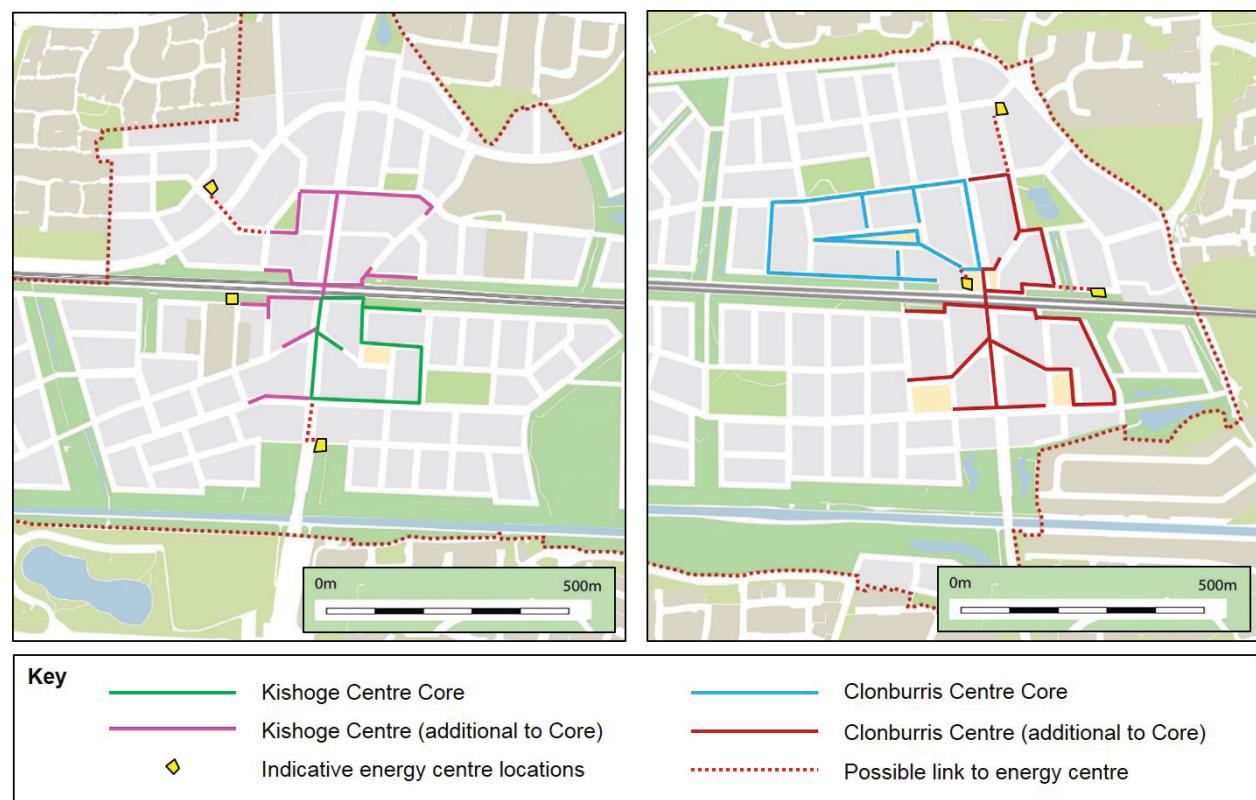
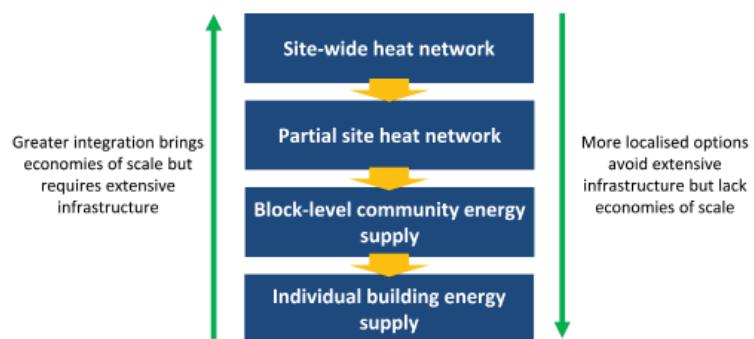


Figure 3: Energy options at Clonburris SDZ



The Clonburris Energy Masterplan recommends that all major developments within the Clonburris and Kishogue urban centres should be designed to be able to connect to a local heat network in the future. This means that such developments have the ability to be connected to a network if / when such a network becomes available in the future, rather than necessarily determining connection at the time of construction. The Masterplan also identifies a range of delivery models and financing structures that could be used to unlock the investment required for local heat networks.

Tallaght Town Centre as a 'living laboratory'

This idea may reach fruition at an earlier stage in Tallaght Town Centre, as the Council has partnered with local business stakeholders in a pilot project to deliver the first stage of a local district-heating network. The project is part of a six-city EU-Funded project under Interreg North West Europe entitled HEATNET. One million euros of infrastructure investment has been secured for Tallaght under the project as well as a professional resource and advice from



the partner cities to seed the heat-network technology in the County. The project, due for completion before 2020 is divided into two strands- the laying of the heat-pipework and heat exchangers and in parallel the development of a governance and procurement delivery route for an ESCO to manage and expand the network.



The project centres on 4th generation district-heating which is required to collect and re-use waste heat from nearby sites. Negotiations are underway with the owners of a large data-centre under construction in the area, which when operational will generate mega-watts of waste heat, which can be intensified to power the heat-network. This would be a radical technical solution and a potential paradigm for other such centres which are notoriously demanding of electricity. Reuse of heat would offer serious reductions in carbon creation, a benchmark moment on the road to a low-carbon town centre. The heat-network will form one of the planning layers of the upcoming Tallaght Local Area Plan, which will encourage innovative and shared energy systems in future development, as well as possible retro-fitting of existing large energy users in their search to meet 2020 and 2030 energy targets.

SDCC experience of the projects

- Climate change plans and projects at SDCC has allowed Planners and a range of staff up-skill in an area that is becoming increasingly relevant at national level, of which a response needs to be mobilised at local authority level.
- The projects undertaken to date has resulted in an increased level of cross-disciplinary and inter-departmental working across the organisation, which has brought added value to the projects and greater efficiency to project management.
- The Council has learned first-hand from best practice across Europe, in particular through organisations such as The Town and Country Planning Association (TCPA). As such the Council has built up a strong stakeholder network with other organisations, including other local authorities across the European Union.
- The Council has developed a unique skill set in the area of European project management and delivery which has resulted in establishing greater links and access to finance and research projects with key climate change stakeholders in Ireland including the Sustainable Energy Authority of Ireland (SEAI) and CODEMA.

Conclusions

In a period of renewed economic growth in Ireland, South Dublin County has a unique opportunity to increase and unlock its share of residential, economic and environmental growth. Given the strong spatial planning and corporate policy commitment to these issues in the County, working in partnership with other EU cities and local authorities to up-skill and innovate in the area of climate change mitigation and accessing European and national funding and best practice, provides a basis in which to influence growth at the local authority level, with particular regard to a transition towards a low carbon economy, enterprise innovation, and resource and material efficiency in the wider Dublin Region.



The HeatNet Model

One of the main outputs of the HeatNet project will be to develop a HeatNet Model (or Guide) specific to the needs of the heating sector in North West Europe. The Model will use exemplar pilot projects to develop, test and re-evaluate such HeatNet tools, resulting in visible and measurable results. The pilot projects selected include district heat schemes in South Dublin County (Tallaght), Kortrijk, Boulogne-sur-Mer, Aberdeen, Plymouth and Heerlen. These pilot projects have been chosen as they represent diverse governance models, business strategies, investment approaches and are at different stages of development. Through the selection of this range of pilots, HeatNet will spread knowledge and know-how between the leader and follower regions across the project partnership.

The resulting HeatNet Model aims to provide guidance in the following areas:

- Non-technical guide to fourth generation district heating;
- Diagnostic and planning tools including energy demand mapping and CO₂ emissions calculator;
- A Procurement Guide to help initiate local projects;
- Governance and partnership options; and
- Protocols for investment standards.

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