



SOUTH DUBLIN SPATIAL ENERGY DEMAND ANALYSIS

**Nomination for
Energy Efficiency and Spatial Planning**

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Introduction

Local authorities and spatial planning tools and strategies across Europe, are recognised as playing key roles in countering the existing reliance on fossil fuels and reducing the impacts of climate change. South Dublin County Council, working in partnership with all stakeholders, aims to prioritise and unlock local low-carbon and renewable energy opportunities to 2022 and beyond. In this context, there is a recognised need to build on spatial planning tools and strategies, in particular County Development Plan policies, focusing on more evidence based and spatially appropriate energy and climate change mitigation policies, objectives and implementation measures. To advance links between energy and spatial planning, SDCC developed a countywide Spatial Energy Demand Analysis in 2015, in partnership with the City of Dublin Energy Management Agency (CODEMA). This was the first study of its kind to be developed by a local authority in Ireland, and it directly informed the South Dublin County Council Draft Development Plan 2016-2022.

Overview of the South Dublin SEDA

Since its establishment in 1994, South Dublin County Council has a proven track record in pioneering activities in sustainable development and promoting the growth of sustainable communities, in particular through spatial planning tools, including County Development Plans, Strategic Development Zones and Local Area Plans. The Council acknowledges that strengthening climate change mitigation, reducing energy consumption and finding alternative, non-polluting and renewable sources for energy provision across sectors, are a priority in order to respond to EU and national energy targets to 2020 and beyond.

There is a recognised need for Planners, local authority staff and decision makers to develop robust, evidence based policy relating to energy and climate change mitigation, including energy efficiency in existing and new building stock, and advancing renewable energy opportunities at the local level.

It is increasingly acknowledged that urban and peri-urban local authorities require an evidence based response that captures a spatial understanding of the existing energy profile across sectors and land uses which can be used as a baseline to understand and consider the future energy scenario to 2020 and beyond. This has been the case for South Dublin County and the South Dublin Sustainable Energy Action Plan 2013 has been used as the starting point.

To frame and develop robust policies in the South Dublin County Council Draft Development Plan 2016-2022, the Council sought to advance the EU Covenant of Mayors and South Dublin Sustainable Energy Action Plan data and methodologies in a spatially geographic manner, to further inform energy policy decisions in the County Development Plan. This approach to energy policy development and integration with Sustainable Energy Action Plans is supported by the Regional Planning Guidelines for the Greater Dublin Area 2010 – 2022. The EU Covenant of Mayors also calls for local authorities to progress SEAP methodologies and to provide greater integration with spatial planning and related actions at the local level.

As a result, the energy data for the commercial, residential and municipal sectors, collated under the EU Covenant of Mayors and Sustainable Energy Action Plan 2013 methodologies, has been further progressed and refined to generate County scale tabulations and maps representing a range of energy information, including energy demand, heat density and costs across sectors. A range of data sources have been used to undertake this study. A summary of the estimated annual South Dublin County energy profile, using 2014 as the baseline year, is shown in Table 1.

Table 1: 2014 South Dublin County Energy Profile and Estimated Costs

Sector	2014 Energy Demand	Estimated Costs
Residential	1.94 TWh	€161 million
Commercial	1.73 TWh	€174 million
Municipal	0.01 TWh	€2 million
Total	3.68 TWh	€337 million

Source: South Dublin Spatial Energy Demand Analysis, April 2015

Why the Project is considered Outstanding

The South Dublin SEDA 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 the various sectors operating in South Dublin County, 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 Central Statistics Office (CSO) Small Areas have been used as the geographical boundaries to spatially represent the County's energy profile, resulting in a detailed level of analysis which can be refined for further studies and planning strategies. The South Dublin SEDA has directly informed County Development Plan policy considerations in the following areas:

Low Carbon District Heating Networks

In order to identify local district heating Areas of Potential, energy information has been analysed in terms of heat density, which is the amount of thermal energy used within a defined area and is an indicator for the economic viability of district heating schemes. The South Dublin SEDA has analysed the energy profiles of the commercial, residential and municipal sectors and has identified Areas of Potential, measured in terajoules (TJ) per square kilometre (KM²). Areas with a heat density above 250 TJ / KM² are identified as the areas of best potential for initial development in South Dublin County. These areas are shown on Figure 1; six of these areas are located in Tallaght (the County town of South Dublin County). Many of the top ten Areas of Potential in South Dublin County are located within the same Electoral Division (ED) and as such could be grouped with other adjoining / nearby sites of high heat density.

Energy Demand and Clusters of High Energy Users

Figure 2 shows total energy demand (both heating and electricity) in each CSO Small Area across South Dublin County. This map

shows areas coloured in darkest red have the highest energy demand in the County. To compare this analysis, Figure 3 shows clusters of high energy users across the County. From a comparison of both maps it is clear that areas with high total energy demand have a high number of commercial / municipal energy users and some users with very high energy demand per building. These areas include premises in Tallaght town centre, Ballymount Industrial Estate and Grange Castle Business Park. In areas demonstrating clusters of high energy users, but not demonstrating heat densities sufficient for a pilot low carbon district heating project, the South Dublin Spatial Energy Demand Analysis identified that there are a range of alternatives for on site / building level alternatives. A range of County Development Plan policies and Development Management standards can be considered in this regard including a range of low carbon and renewable thermal and electricity opportunities.

Analysis of South Dublin County Dwelling Stock

The energy performance of existing buildings is one of the foremost considerations in responding to the energy challenge at local authority level. Figure 4 shows the distribution of Building Energy Ratings in South Dublin County, according to the period of dwelling construction. Figure 5 shows the annual estimated residential energy costs across the County. The analysis of the residential sector indicates that approximately 56% of BERs 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. Terraced housing and apartments make up the majority of A and B BERs, with the majority of A and B rated homes built from 2006 onwards. The lower F and G rated dwellings are dominated by buildings constructed in the period 1919 – 1970. This analysis assists in the identification of homes that could be at risk of fuel poverty.

The Energy Chapter of the South Dublin County Council Development Plan 2016-2022 details this research in more detail and includes policies, objectives and Development Management standards directly informed by the South Dublin SEDA.

Input of the Planner

The South Dublin SEDA was developed by Planners at SDCC, with particular regard to the following areas:

- Planners involved in the South Dublin Sustainable Energy Action Plan 2013, reviewed and advised on methodologies to advance the SEAP from a sectoral, numerical data analysis to a spatial and visual characterisation of a range of energy information.
- SDCC Planners engaged with wider stakeholders at national and EU level to ensure that a best practice approach was developed to prepare the South Dublin SEDA, including the Town & Country Planning Association (UK) and the Swedish Society for Town & Country Planning.
- The series of maps produced as part of the South Dublin SEDA including energy demand, heat density and costs across sectors, informed the review of the County Development Plan and the climate change mitigation policies, objectives and implementation standards contained in the South Dublin County Council Draft Development Plan 2016-2022.
- In partnership with CODEMA, SDCC Planners informed the development of a Spatial Energy Demand Analysis methodology that can be replicated by adjoining local authorities in the Dublin region and others across Ireland.
- SDCC as a member of the EU Covenant of Members, is sharing its experiences in increasing the integration of Sustainable Energy Action Plans and spatial planning to Planners across Europe. This is facilitated through continued SDCC participation in EU projects, such as the IEE supported, Spatial Planning & Energy for Communities in All Landscapes (SPECIAL) project www.special-eu.org

Benefits of the Project

The South Dublin Spatial Energy Demand Analysis represents a visualisation of energy character areas across South Dublin County and acts as a robust starting point to inform the energy policies and objectives of the next County Development Plan, Strategic Development Zones (SDZ) and other local plans and strategies.

In response to this spatial analysis, the SEDA highlights energy efficiency and renewable energy alternatives that should be further explored in County Development Plan policies, objectives and Development Management standards, in the context of the location of the County (within the Dublin Region) and the variety of the sectors, built environment and land uses present. Basing the SEDA on the foundations of the Sustainable Energy Action Plan methodology strengthens the capacity building and commitment of local authority staff, and can increase local political support to the energy and climate change mitigation agenda (in particular by signing up to the Covenant of Mayors).

The South Dublin SEDA is the first of its kind to be prepared by a local authority in Ireland and marks a significant step forward in integrating spatial planning and planning for energy alternatives. The SEDA has also facilitated a ‘bottom-up’ approach to responding to challenging EU and national energy targets to 2020 and beyond.

By utilising and advancing the Sustainable Energy Action Plan and Covenant of Mayors methodologies, it also points towards the development of a regional methodology and spatial approach to energy profiling and broadening the local canvas for planning for renewable energy, across local authority boundaries.

By compiling a detailed local energy analysis the SEDA facilitates the opportunity for further local level analysis in South Dublin County, including the development of renewable resource mapping i.e. solar roof space analysis and mapping of waste heat sources. Detailed case studies could also be carried out to ascertain the technical and economic feasibility of a range of measures.