

Chapter 9 Energy

9.1 Introduction

Energy is an essential component of human activity and the availability of a clean and constant supply to meet the needs of current and future generations is of growing concern to governments and peoples across the globe. In addition, the traditional use of fossil fuels as the main global energy source, particularly oil consumption, is having a significant impact in accelerating global warming

During the duration of the 2003 – 2009 County Development Plan, County Louth, in common with the rest of the state, experienced rapidly increasing energy consumption. In national terms, the increase in the use of energy combined with a decreasing domestic production capacity, resulted in a significant increase in energy imports. Over the period 1990 to 2006 Ireland experienced high levels of growth in energy demand, of an average of 3.3% per year. Between 1990 and 2006, Ireland's total annual energy requirement grew in absolute terms by 67%. The State as a whole is highly dependent upon imported oil and gas to meet its energy needs. However in 2006, 8.5% of Ireland's gross electricity was produced from renewable energy compared to 4.9% in 1990.

In 2008, Bord Pleanála granted planning permission for a gas powered 450 mega watt electricity generating station at Toomes, north west of Louth Village. When commissioned, this plant will provide an important source of energy that will be of major benefit to County Louth, particularly with regard to economic development and competitiveness.

The key objective of the council in relation to energy is to ensure that the county has sufficient energy resources available to drive economic development and improvement in the quality of life of the people of Louth.

9.2 EU and National Policy

The European Council Energy Action Plan, 2007 endorsed a binding target of 20% of EU energy consumption being produced from renewable resources by 2020. The Government's Energy White Paper –*Delivering a Sustainable Energy Future for Ireland 2007* contains the following key targets with regard to renewable electricity.

- 15% of Ireland's gross electricity consumption from renewable sources to be achieved by 2010
- 30% biomass co-firing at three state owned peat power generation stations to be achieved by 2015
- 33% of Ireland's gross electricity consumption from renewable sources to be achieved by 2020
- 500 megawatt (MW) ocean energy capacity to be installed by 2020
- 400 MW combined heat and power (CHP) with particular emphasis on biomass fuelled CHP, to be achieved by 2010 and 800 MW by 2020

EU and national policy is aimed at the creation of a competitive renewable energy sector characterised by innovation and driven by research and technology lead development.

The council is aware that the County Louth has significant potential for the development of renewable sources of energy such as wind energy, solar energy, ocean energy and bio energy and therefore, the provision of such alternative energy resources will be encouraged on suitable sites throughout the county.

Policy

EN 1 To promote and encourage the provision of alternative energy resources in line with the Government's White Paper *Delivering a Sustainable Energy Future for Ireland*.

9.3 Sustainable Energy Ireland (SEI)

Sustainable Energy Ireland was set up by the government in 2002 as Ireland's national energy agency to promote and assist the development of sustainable energy. Under the government's decentralisation programme, SEI is being relocated to Dundalk. The organisation currently occupies a regional office in the Finnabair Industrial Estate and has developed strong linkages with Dundalk Institute of Technology, Louth County Council, Dundalk Town Council and the private sector.

Sustainable Energy Ireland has been instrumental in the development and implementation of a number of innovative energy use and conservation projects in Louth, primarily in Dundalk. These include:

- The Dundalk 2020 Holistic Project. This involves a partnership between SEI, Dundalk Town Council, Louth County Council, institutional bodies and the private sector supported by EU Concerto funding. The project covers a defined geographical area to the south of Dundalk and aims to secure the efficient use of energy, including a minimum of 20% of energy requirements from renewable resources.
- Bright Ideas event. The first Bright Ideas event was held in Dundalk in 2008. It brought together over one hundred of the north east's lighting manufacturers, engineers, architects, interior designers, property managers and lighting retailers to learn more about how to use lighting in an effective and efficient manner.

The council will work in partnership with, and support existing and proposed initiatives by SEI in County Louth.

Policy

EN 2 To work in partnership with, and support existing and proposed initiatives by, SEI in County Louth.

9.4 Electricity Transmission Power Lines

The provision of a secure and reliable electricity transmission infrastructure is essential to ensuring the growth of Louth's economy. While certain classes of development by the

statutory electricity providers constitute exempted development under the Planning and Development Regulations, major electricity infrastructure provision is subject to planning control.

Policy

- EN 3 To support the statutory providers of national grid infrastructure by protecting identified strategic corridors from encroachment by developments that might compromise the provision of energy networks.
- EN 4 To require the under-grounding of electrical cables within new residential, commercial or civic developments.
- EN 5 To require that all high voltage lines of 38 KV and over comply with all internationally recognised standards with regard to proximity to dwellings and other structures in which the public assemble.
- EN 6 To ensure that the siting of electricity power lines is managed in terms of the visual impact on the environment, especially in sensitive landscapes.

9.5 Natural Gas Supply Network

Bord Gais Éireann has a substantial distribution network in County Louth, covering Dundalk, Drogheda, Dunleer, Ardee and Termonfeckin. Factors such as demand, size of settlements and commercial developments, especially adjacent to the existing network, drives expansions of their service.

Policy

- EN 7 To support the expansion of the natural gas supply network in the county.

9.6 Renewable Energy

Ireland has significant renewable energy resource potential in terms of wind, wave, solar, tidal, ocean and bio energy and it is important that these resources are developed and fully utilised in order to reduce dependency on costly, imported fossil fuels.

The National Climate Change Strategy (NCCS) 2007 – 2012 details the measures by which Ireland will meet its Kyoto 2008 - 2012 commitment. It states that 'electricity generation from renewable sources provides the most effective way of reducing the contribution of power generation to Ireland's greenhouse gas emissions'.

The development of renewable energy sources will assist in the provision of a secure and stable energy supply for the long term and will also provide employment in indigenous renewable energy projects which are often located in rural and underdeveloped areas.

Policy

- EN 8 To encourage the production of energy from renewable resources, including wind energy, solar, ground heat source, biomass, tidal, wave and generation from waste material, subject to normal proper planning considerations, including in particular the impact on areas of environmental or landscape sensitivity.
- EN 9 To co-operate with the appropriate authorities in Northern Ireland in the provision of all-island renewable energy
- EN 10 To support initiatives aimed at reducing the level of energy consumption within the county.
- EN 11 To require that all new buildings in County Louth demonstrate that at least 25% of a building's energy requirements are from renewable sources. This should be calculated on the basis of an approved method carried out by a qualified and accredited expert.

9.6.1 Wind Energy

Wind energy can make a significant contribution as a clean sustainable solution to energy requirements. It is envisaged that wind power generation will play a major role in the achievement of green electricity targets in Ireland, due to the prevailing climatic conditions.

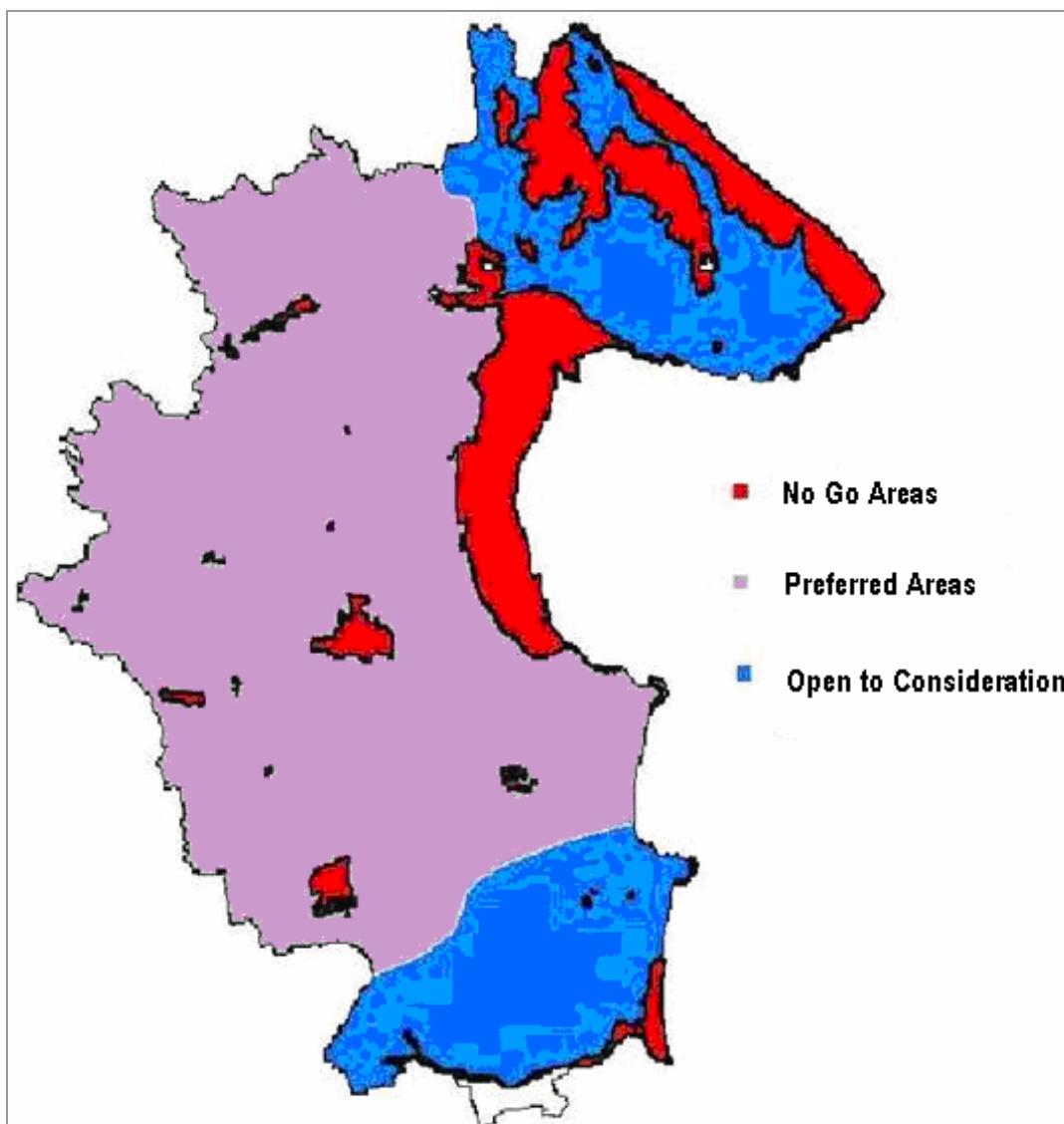


Although located on the east coast where wind availability and speed tends to be less than west coast locations, County Louth still has significant potential for wind energy production. However, the county's diverse landscapes have varying degrees of sensitivity to wind energy generating infrastructure and therefore, care will need to be exercised in their location and siting.

The *Wind Energy Development Guidelines for Planning Authorities 2006* published by the Department of Environment, Heritage and Local Government sets out in detail various development control considerations, including site selection, siting and layout for various types of wind energy projects.

The council carried out substantial preliminary work on the preparation of a detailed wind energy development strategy and based on considerations of wind speed, designated conservation sites and landscape sensitivity, has identified "preferred areas", "areas open for consideration" and "no go areas" in accordance with the DoEHLG guidelines. These are identified in map 9.1.

Map 9.1: Areas Suitability to Wind Development



Policy

- EN 12** To promote the location of wind farms and wind energy infrastructure in the “preferred areas” as outlined in map 9.1, to prohibit such infrastructure in the areas identified as “no go areas” and to consider, subject to appropriate assessment, the location of wind generating infrastructure in areas “open for consideration”.
- EN 13** To facilitate the development of wind energy sources where proposals are consistent with the landscape preservation objectives of the Plan, the protection of the natural and built environment and the visual and residential amenities of the area.
- EN 14** To require all wind farm developments to comply with the *Wind Energy Development Guidelines for Planning Authorities*.

9.6.2 Solar Energy

The sun is the absolute source of all energy on earth. It powers natural cycles on earth like the wind, water flow and plant growth and is a reliable source of heat and light. Modern technology can be used to capture and magnify the sun's energy for a variety of energy generation and conservation uses.

Solar energy technologies can provide energy for space heating and cooling in active and passive solar buildings, potable water via distillation and disinfection, daylight, hot water, thermal energy for cooking and at high temperature process heat for industrial purposes.

Policy

EN 15 To encourage the use of solar energy technologies in all new developments taking place in County Louth.

9.6.3 Bio Energy

The bio energy sector is emerging as a viable alternative to the traditional non-renewable energy supply sources of oil and coal. Biomass is plant and animal material which can be used as a source of fuel. It can be refined or upgraded to produce either solid bio fuel such as wood pellets and liquid bio fuels which include bio diesel.

The development of the bio energy sector also can have economic benefits for rural areas in particular. The production of energy crops is a means of sustaining and regenerating rural areas at a time where there is a decline in traditional farming practices.

It should be noted however that experience elsewhere in the world has shown that an over emphasis on the production of bio fuel crops can have a detrimental effect on the production of food as more and more land is turned over to monoculture crops destined for bio fuel production. There are also significant ecological and environmental consequences associated with the designation of farmlands for bio fuel production.

Policy

EN 16 To support the production and refining of biomass for energy generation purposes whilst adopting the precautionary approach to large scale production of bio fuels in County Louth.

9.6.4 Wave Energy

Studies of European wave energy resources have indicated that the average wave power in Europe is highest near the west of Ireland with an average wave power of 76kw occurring off the Irish coast. Ireland, Scotland and Northern Ireland have committed to a joint approach in the development of wave and tidal energy.

Whilst the west coast of Ireland has the greatest wave generation power, there is no doubt that potential also exists in the waters off Louth's coast. The amount of this accessible resource which can ultimately be realised will depend on the cost effectiveness of wave energy technology, the amount of power which can be practically connected to the grid and

the amount of capacity available on the network when other intermittent generation sources such as wind energy are considered.

Policy

EN 17 To support the development of wave energy in suitable waters off the coast of County Louth subject to the protection of important marine habitats.

9.6.5 Tidal and Ocean Energy

In 2006, the Marine Institute and Sustainable Energy Ireland prepared *the National Strategy for Ocean Energy*. This phased strategy aims to introduce ocean energy into the renewables' portfolio in Ireland. Tidal energy is an important element of this overall strategy. Carlingford Lough and the Boyne Estuary could have potential for the generation of tidal energy.

Policy

EN 18 To support the development of tidal energy in suitable waters off the coast of Louth subject to the protection of important marine habitats.

9.6.6 Sustainable Design and Energy Efficiency in Buildings

Dwelling Energy Assessment Procedure (DEAP) is the official Irish procedure for calculating and assessing the energy performance of dwellings. Published by Sustainable Energy Ireland (SEI), the procedure takes account of the energy required for space heating, ventilation, water heating and lighting, less savings from energy generation technologies. It calculates both the carbon dioxide (CO₂) emission rate and energy consumption per annum. This is a useful tool for designers when considering and comparing options to conserve energy and reduce CO₂ emission.

DEAP is used to calculate the Building Energy Rated (BER) of dwellings. The BER is a label containing the energy performance of the dwelling. Expressed as primary energy use per unit floor area per year (kWh/m²/per annum) and illustrated as an energy rating (A1, A2, A3, B1, B2, B3, etc) for the dwelling, it also includes CO₂ emissions indicator (kgCO₂/m²/yr) associated with this energy use and an advisory report. Under Building Regulations all buildings will in time be required to be energy efficient. As of now the roll out of this requirement applies as follows to:

- All dwellings commencing on or after 1st January 2007
- All new buildings other than dwellings commencing on or after 1st July 2008
- All existing buildings when let or sold on or after 1st January 2009

The right design decisions in relation to building form, internal layout, levels of insulation, amount and orientation of glazing, utilisation of solar energy, heating system and fuel type, use of draught lobbies, construction materials and measures to conserve potable water, can contribute greatly to sustainability. In addition these will lead to cost savings in the long term, while raising the level of comfort for the occupants of the dwelling.

Policy

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| EN 19 | To ensure that all new developments comply in full with Part L of the Building Regulations (as amended in 2008). |
| EN 20 | To promote the use of district heating systems in large scale development and master planned areas. |
| EN 21 | To encourage the reuse of existing obsolete buildings for new uses. |
| EN 22 | To encourage the recycling of building materials on development sites. |
| EN 23 | To encourage the design and construction of buildings that are functionally adaptable and can be maintained with minimal use of resources. |
| EN 24 | To support the utilisation of building and landscape design features to minimise energy requirements |
| EN 25 | To ensure that all new buildings are designed and constructed having regard to the Guidelines for Sustainable Design and Energy Efficiency in Buildings as set out in paragraph 9.7 of the Plan. |

9.7 Guidelines for Sustainable Design and Energy Efficiency in Buildings

This section sets out guidelines for the sustainable design, siting and construction of buildings, particularly, with regard to energy efficiency and energy conservation, as well as waste management, waste disposal and sustainable urban drainage systems. These standards need to be read and adhered to in conjunction with improved national standards which came into effect from the 1st of July 2008 (Part L of the Building Regulations 2007, as amended).

Measures that promote energy conservation and efficiency in buildings include air tightness, appropriate use of glazing, high insulation standards and more efficient heating. Alternative forms of electricity and heat generation should also be considered. The various elements in relation to energy conservation and ecological building design are further outlined in this section.

1. Passive Solar Design

Passive Solar Design (PSD) techniques relate to the siting, layout, built form and the landscaping of a development. The use of PSD techniques is cost effective, as it requires little or no cost to the developer and can amount to substantial savings on behalf of the owner/occupier. It also reduces the long-term use of fossil fuels and thereby reduces CO₂ production.

The main elements for the application of PSD with regards to design, siting and layout are as follows:

- *Orientation - To maximise solar access and its benefits, the principle façade of a building should be orientated to be within 30 degrees of south where feasible. A southerly orientation maximises solar gain in winter.*
- *Wind – Buildings should be designed and located to reduce the impact of wind chill and suitable shelter belts should be incorporated.*
- *Openings - Large glazed surfaces should be located on the southern face of the building. These surfaces must be highly insulated through high performance glazing to prevent the loss of heat.*

- *Internal planning* - The internal layout of buildings should be designed by setting occupied spaces to the south and service spaces to the cooler north.
- *Avoidance of overshadowing* – Where feasible, buildings should be carefully spaced to minimise the loss of solar gain due to overshadowing.

2. Low Energy Performance Buildings

All new buildings should be designed to comply with low energy performance standards. The current minimum energy performance requirements for residential buildings are set out in the Second Schedule to the Building Regulations 1997 (S.I. No. 497 of 1997). Amendments to the statutory regulations came into effect from the 1st of July 2008 (Building Regulations (Amendment) Regulations 2007 (S.I. No. 854 of 2007)). It will be a prerequisite of all development in the Plan area that the provisions of the amended building regulations be complied with.

4. Active Solar Design

Active solar systems can work in unison with passive systems and provide an alternative mechanism for harnessing solar energy. This system does not rely on site orientation or layout but can be incorporated into any building design to maximise energy efficiency. Active solar technology involves the installation of a solar collector device; this device absorbs the sun's heat to provide space or water heating. A correctly sized unit can provide around half of a household's water needs over a year; large buildings can introduce several systems to increase solar absorption.

5. Alternative Heating Systems

Energy efficient heating systems such as wood pellet stoves and boilers and geothermal heat pumps can greatly help to reduce energy consumption. Geothermal heat pumps (GHP) work by extracting heat energy from a low temperature source and upgrading it to a higher temperature so that it can be used for space and water heating. Heat pumps are very economical. For every unit of electricity used to power the heat pump, 3 to 4 units of heat are generated. They work best in conjunction with low temperature heat distribution systems e.g. under floor heating. Wood burning systems do emit carbon dioxide. However, as the wood fuel is cultivated, it absorbs the exact same amount of carbon dioxide as is released when burnt. As such it does not add to the carbon dioxide in the atmosphere. An eligible system can be used for heating a single room, hot water or a whole house.

6. Reduction in Water Consumption

Fresh water resources are increasingly becoming an issue of environmental and economic importance. According to the European Environment Agency, the average consumption for all household purposes is about 150 litres per capita (1999). On this basis the average water consumption per person in Ireland comes to a staggering 55,000 litres per person per year. The third biggest user of water is the WC, accounting for almost 35% of a person's average daily water consumption. In this regard the use of dual flush or low water capacity cisterns should be used.

7. Rain Water Harvesting

Rain water recovery systems harvest rain water which can then be used for the flushing of toilets, washing machines and general outside use. A rainwater holding tank is installed below the ground that gathers water from the roof of buildings. This water is pumped into a tank within the building's roof space where it is stored until required. This water would otherwise have to be treated and pumped by the local authorities presenting a substantial saving. The system filters and collects between 20% and 30% of total water consumption used by a family of four. The system is isolated from the mains water system to eliminate any possibilities of contamination. In the event of using all of the rainwater reserve, an automatic change over system switches over to using mains water until the rainwater tank starts to refill. The rainwater system generally has three separate filters which reduce particles down to 130 microns. These systems should have the British Board of Agreement approval to meet the Building Regulations.

8. Wind Energy

The use of wind turbines to provide a self-sufficient power source or to supply power in combination with other energy sources merits investigation for any large scale development. The Planning and Development Regulations 2006 exempts from planning permission certain types of renewable energy structures including small scale wind turbines. The use of these technologies should be incorporated into the design of buildings from the outset. Proposals for the provision of small and medium size wind turbines which fall outside the exempted development categories will be favourably considered by the council provided that they do not significantly impact on visual or residential amenities of the area.

9. Construction Methods

Consideration should be given to the use of renewable building materials such as wood from sustainably managed forests and locally sourced building materials for development projects. Other features of construction should also be considered such as off-site construction and prefabrication to minimise the impact of building on the site, reductions in levels of on-site waste and also minimising cost. The re-use of construction waste such as excavated material and topsoil should also be considered.

10. Waste Management and Disposal

All future developments should seek to minimise waste through reduction, re-use and recycling. Waste management and disposal should be considered as part of the construction process and in the operation of the development when completed.

11. Construction Waste

Construction related waste accounts for about one-third of total land filled waste in Ireland. Therefore developers and builders should minimise construction waste generated in development projects. During the construction process measures should be implemented to minimise soil removal (as part of the scheme design process), properly manage construction waste and encourage off-site prefabrication where feasible.

12. Domestic Waste

Everyday domestic waste produced by future residents and businesses shall be minimised through reduction, reuse and recycling. All new developments should provide for waste separation facilities, recycling banks and compost units.

13. Precipitation and Climate Change

Buildings should, as far as is practical, be future proofed against increased precipitation and storm frequency likely to result from climate change. The following check list should be applied:

- *Check existing water table and natural patterns of drainage*
- *Calculate rainwater guttering and pipe work on the basis of up to 30% increase in precipitation*
- *Use soft landscaping to reduce storm water runoff and help the rain to percolate naturally back into the water table*
- *Use porous paving schemes to allow water to flow down through hard landscaping directly into the water table to minimise drainage requirements and relieve pressure on existing drainage*
- *Retain robust roofing details including sarking in preference to battens*
- *Preserve and increase planting of trees to absorb CO₂ to help reduce global climate change*

14. Micro climate enhancement

Trees and shrubs can make a significant contribution to energy conservation by providing shelter and modifying climate at the micro level. Designers and developers should plant deciduous trees and use hard landscaping on the south side of buildings to enhance the micro climate and minimise energy use.

