



# Chapter 10

## Infrastructure and Public Utilities

*“Support County Louth’s strategy for targeted population and strong economic growth in line with national and regional objectives through protection, improvement and extension of water services infrastructure, and flood alleviation services throughout the County, in conjunction with other statutory bodies. Encourage and support energy and communication efficiency to achieve a reasonable balance between responding to EU and national policies on climate change, renewable energy, communications and enabling resources to be harnessed in a sustainable manner in accordance with the future proper planning and development of the County.”*

## Chapter 10 – Infrastructure & Public Utilities

## 10 INFRASTRUCTURE & PUBLIC UTILITIES

### 10.1 UISCE ÉIREANN

#### 10.1.1 Introduction

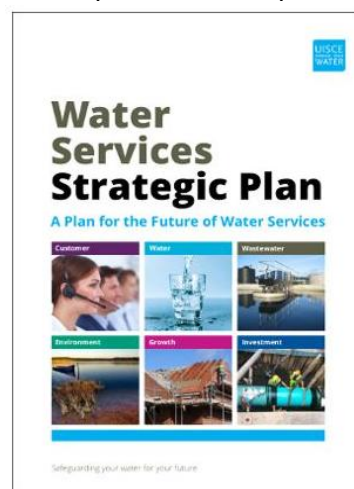
The sustainable growth of the County is dependent, *inter alia*, on the provision of adequate water and waste water services and infrastructure. A strategic approach in accordance with the County's Core and Settlement Strategies is essential for the delivery of such services, in order to ensure there is adequate capacity to support the future development of the County including economic investment and sustainable and attractive communities. Such infrastructure provision must be implemented in a manner that protects public health, is environmentally appropriate and all within the context of a changing climate.

In accordance with the *Water Services Act 2013*, the responsibility for the provision of public water supply, wastewater collection and treatment services transferred from the remit of the local authorities to Uisce Éireann. Since 2014, Uisce Éireann has been responsible for the operation of public water services including the management and maintenance of water assets and infrastructure, the delivery of capital projects, strategic planning and policy development. It is an objective of Uisce Éireann to provide drinking water and wastewater capacity to facilitate growth in accordance with core strategies at County level and in accordance with the policies and objectives at both national and regional level. It is accountable to two regulatory bodies; the Commission for Regulation of Utilities (CRU) which is the economic regulator for the water industry and the Environmental Protection Agency (EPA) which is the environmental regulator.

Louth County Council through its Service Level Agreement (SLA) with Uisce Éireann is contracted to manage and maintain all aspects of water and wastewater provision, operation and maintenance and capital project management in County Louth, on behalf of Uisce Éireann.

Currently, Uisce Éireann is developing the National Water Resource Plan (NWRP) outlining how to move to a sustainable, secure and reliable public drinking water supply over a 25 year period while safeguarding the environment. It will outline how Uisce Éireann intends to maintain a balance between supply from water sources around the country and demand for drinking water over the short, medium and long term. This will facilitate future planning and ensure provision of sufficient, safe and clean drinking water to facilitate the social and economic growth of our country.

In 2015 Uisce Éireann prepared its *Water Services Strategic Plan* (WSSP) setting out the strategic objectives for the delivery of water services over a 25 year period whilst setting the context for investment and implementation plans.



This Plan is reviewed on a five yearly cycle and the first review was completed in October 2020. Uisce Éireann and Louth County Council will continue to work in partnership, to identify the water services required to support planned development in line with national and regional planning policies for inclusion in the Uisce Éireann Capital Investment Plans.

Uisce Éireann 's Capital Investment Programme (CIP) outlines the indicative priorities and investments in water services infrastructure over the plan period.

The CIP aims to deliver improvements in drinking water quality, leakage, wastewater compliance, business efficiencies and customer service. The Commission for Regulation of Utilities (CRU) has recently approved Uisce Éireann 's third Revenue Control Period (RC3), with supporting Investment Plan (2020-2024).

Where development proposals arise that require upgrading/expansion of Uisce Éireann strategic infrastructure over and above that included in the Capital Investment Plan (CIP), or require the accelerated delivery of planned infrastructure, Uisce Éireann will undertake an economic assessment of the implications of these requirements.

This will take account of the provisions of this Plan and wider government policy on planning and will provide, where relevant, indicative costs to the connection applicant of Uisce Éireann providing this infrastructure (as detailed in Uisce Éireann 's Connection Charging Policy).

The Council, in conjunction with Uisce Éireann , will continue to encourage full capacity use of available infrastructure and to encourage connections to existing infrastructure where capacity exists, in order to maximise use of existing infrastructure and reduce additional investment costs.

The Council remains the designated Water Authority for the assessment and approval of individual domestic on-site wastewater treatment systems in the County. It is also responsible for the Rural Water Programme, surface water drainage, flood management and monitoring of surface water quality.

**Policy Objective**

<b>IU 1</b>	To liaise and work in conjunction with Uisce Éireann in identifying, prioritising and progressing the implementation of water and wastewater projects throughout County Louth over the lifetime of the Plan, in accordance with the Core and Settlement Strategies.
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### 10.1.2 Wastewater and Water Services

The Water Services Section of Louth County Council will co-operate with Uisce Éireann in providing and maintaining adequate public water supply and wastewater collection and treatment infrastructure throughout the County for the period of the plan and beyond.

In conjunction with Uisce Éireann, the Water Services Section of Louth County Council will endeavour to ensure the continued investment in, and delivery of, improvements to water infrastructure over the Plan period, through the implementation of the CIP 2020-2024.

### 10.1.2.1 Wastewater Collection and Treatment

The provision and maintenance of quality wastewater collection and wastewater treatment infrastructure is essential for the sustainable development and protection of the environment and public health. Uisce Éireann is responsible for the treatment of wastewater in towns and villages where public wastewater treatment facilities exist and currently operates eighteen public sewerage schemes in the County.

It is the policy of Louth County Council to work in conjunction with Uisce Éireann to protect existing wastewater infrastructure, to maximise the potential of existing capacity and to facilitate the timely delivery of new wastewater services infrastructure to facilitate future growth.

### 10.1.2.2 Water Supply and Distribution

The provision and maintenance of quality water treatment and water distribution infrastructure is essential for the sustainable development of communities and businesses within the County. Uisce Éireann is responsible for the treatment and supply of water in towns, villages and rural areas, where public water supply schemes are in place and currently operates thirteen water supply schemes in the County, from three water resource zones. It is the policy of the Council to work in conjunction with Uisce Éireann, to protect existing water infrastructure, to maximise the potential of existing capacity and to facilitate the timely delivery of new wastewater services infrastructure to facilitate future growth.

#### Policy Objective

<b>IU 2</b>	To work in conjunction with Uisce Éireann to protect and make existing water and wastewater infrastructure climate resilient to maximise the potential of existing capacity and to facilitate the timely delivery of new water and wastewater services infrastructure, to facilitate existing and future growth.
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#### Policy Objective

<b>IU 3</b>	To support the development of Drinking Water Protection Plans in line with the requirements of the Water Framework Directive and the current and future cycles of River Basin Management Plans. In this regard, the Council supports mitigation and protection measures for all protected areas, including Drinking Water Protected Areas and associated Source Protection Plans.
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#### Policy Objective

<b>IU 4</b>	To support the provision, extension and upgrade of high quality water and wastewater services infrastructure for both existing and future developments within County Louth, consistent with the principles of sustainability, prioritising those centres where serious deficiencies are in evidence or where further sustainable development can be reasonably anticipated.
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#### Policy Objective

<b>IU 5</b>	To support the extension or upgrading of existing water services infrastructure within the County (including those listed in the IW Investment Programme) and the provision of water services infrastructure in unserved settlements to assist in the proper planning and sustainable development of the County.
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**Policy Objective**

<b>IU 6</b>	To require all new developments connect to the public supply where public water and wastewater infrastructure is available or likely to be available and which has sufficient capacity.
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**Policy Objective**

<b>IU 7</b>	To support the development and proper management of Group Water Schemes subject to appropriate level of treatment being provided and suitable robust arrangements being put in place.
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**Policy Objective**

<b>IU 8</b>	To discourage the use of pump stations for conveyance of sewage unless the proposed pump station will cater for a significant catchment of zoned development lands that otherwise cannot be serviced. Where deemed appropriate, in consultation with Uisce Éireann, temporary pumping arrangements may be considered as an interim measure, pending the provision of more permanent arrangements within a reasonable timeframe. All arrangements for same will be as per the requirements and agreement of Uisce Éireann.
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**10.2 WATER CONSERVATION**

Louth County Council has been successful in its water conservation programmes to date in both Drogheda and Dundalk. Water conservation measures such as leak detection, demand management and pressure management are employed to reduce the demand for potable water, therefore facilitating additional development and improving the level of service to existing customers.

Uisce Éireann operates a National Leakage Reduction Programme, which involves fixing or replacing old, damaged pipes and reducing high levels of leakage to provide a more reliable water supply.

**Policy Objective**

<b>IU9</b>	To support the commitment to water conservation and leakage reduction in accordance with best practice, and through the implementation of the National Leakage Reduction Programme, in order to conserve valuable resources and reduce wastage.
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**Policy Objective**

<b>IU 10</b>	To support Uisce Éireann in promoting public awareness and involvement in water conservation measures by households, business and industry.
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**Policy Objective**

<b>IU 11</b>	To encourage new developments to incorporate water conservation measures such as rain water harvesting to minimise wastage of water supply.
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### 10.2.1 Rural Water Programme

Private supplies provide water to those areas not served by a public water supply. They comprise private Group Water Schemes serving local communities or private wells serving single dwelling houses. There are seven private Group Schemes operating in County Louth. The Council supports the continued operation and development of the private Group Scheme sector through the administering of subsidies and grants, as provided for under the Rural Water Programme.

#### Policy Objective

<b>IU 12</b>	To promote and support the development and proper management of Group Water Schemes in the County, subject to an appropriate level of treatment being provided and suitable robust operational arrangements being put in place.
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### 10.2.2 Wastewater Treatment and Disposal Systems

The provision of well-maintained quality wastewater treatment infrastructure is essential to facilitate sustainable development in the County, while also protecting the environment and public health. All wastewater, including domestic and trade, ultimately discharges to water, whether ground, surface or marine. Therefore, the provision of satisfactory waste water treatment and disposal is essential for the protection of the environment. Uisce Éireann is now responsible for the treatment and disposal of wastewater, where public wastewater facilities exist within settlements.

All trade effluent requires an effluent discharge licence whether discharging to ground or surface waters. Domestic effluent discharging to surface waters and to ground waters (where the volume of discharge exceeds 5 cubic metres in any 24hr period) also requires a discharge licence. Treated wastewater discharging to ground and surface waters under licence, must not result in deterioration of the status of the water body and must comply with the groundwater and surface water regulations.

The use of grey water collection and recovery systems may be considered subject to compliance with building regulations. The building regulations recommend that only water from washing machines and baths is used for this purpose and not from kitchen sinks and dishwashers.

#### Policy Objective

<b>IU 13</b>	To require that all development taking place within an area served by a public wastewater treatment system connects to that system.
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#### Policy Objective

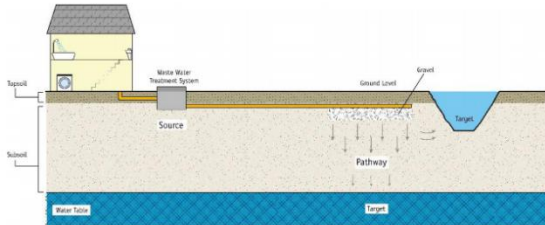
<b>IU 14</b>	To require that on lands identified for non-domestic development where no public waste water facility exists or is proposed, that the wastewater be adequately treated and discharged to suitable receiving water, subject to a discharge licence.
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#### Policy Objective

<b>IU 15</b>	To promote rain water harvesting and grey water use in all developments and in particular for larger developments, as an alternative to attenuation.
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### 10.2.3 On-site Wastewater Treatment Systems

Louth County Council is the designated Water Authority for the assessment and approval of individual private domestic on-site wastewater treatment systems in the County.



The main method of sewage disposal in rural areas is by means of individual septic tanks and proprietary wastewater treatment systems. The requirements for these systems are set out in the EPA Code of Practice Domestic Waste Water Treatment Systems, Population Equivalent  $\leq 10$  (2021).

Policy Objective	
<b>IU 16</b>	To require that proper supervision, installation and commissioning of on-site wastewater treatment systems by requiring site characterisation procedures and geotechnical assessments be carried out by competent professionally indemnified and suitably qualified persons.

Policy Objective	
<b>IU 17</b>	To require that the construction and installation of all wastewater treatment systems are supervised and certified by a suitably qualified competent person as fit for the intended purpose and comply with the Council's requirements.

Policy Objective	
<b>IU 18</b>	To require that private wastewater treatment systems for individual houses where permitted, comply with the recommendations contained within the EPA Code of Practice Domestic Waste Water Treatment Systems, Population Equivalent $\leq 10$ (2021).

### 10.2.4 Water Drainage

Louth County Council and Uisce Éireann have developed a Memorandum of Understanding (MoU) in respect of surface water drainage and flood management.

With the construction of new development, less rainfall is absorbed into the ground with a corresponding increased volume and rate of flow to drains. This has the potential to cause localised flooding in streams and piped drains, in addition to bringing surface contaminants directly into water courses, causing pollution.

### 10.2.5 Sustainable Drainage Systems

The Greater Dublin Strategic Drainage Study (GSDS) produced five policy documents, which include:

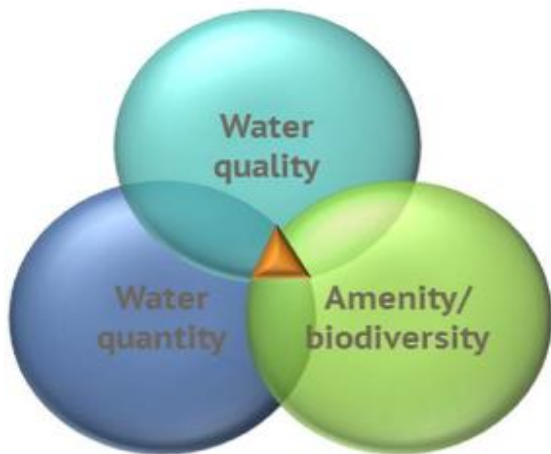
- Environmental Management;
- Drainage of New Developments and;
- Climate Change.

These documents focused on the design approach and criteria for drainage infrastructure within new development to ensure it did not continue the trend of pollution and flooding of waterways.

Sustainable Drainage Systems (SuDS) can best be summarised as offering an integrated approach and total solution to rainwater management and is applicable to urban and rural areas. The SuDS technique is a method of replicating the natural characteristics of rainfall runoff from any site, ensuring water is infiltrated or conveyed more slowly to the drainage system and ultimately to water courses via permeable paving, swales, green roofs, rain water harvesting, detention basins, ponds and wetlands.

These facilities are designed to prevent pollution of streams and rivers and minimise the impacts of urban runoff by its capture as close to the source as possible and its subsequent slow release so that development impact is neutral or positive on flooding.

In addition to forming part of the County’s drainage infrastructure, SuDS can also provide amenity benefits to local communities and benefits for biodiversity simultaneously. Properly designed and located SuDS features can be incorporated within and can complement the amenity and aesthetic value of open spaces. Detailed measures in relation to SuDS techniques in all forthcoming Local Area Plans shall be appropriately designed to enhance biodiversity and amenities and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned.



**The SuDS triangle**

The SuDS philosophy is to replicate, as closely as possible the natural drainage from a site before development.

SuDS is designed within the opportunities and constraints of a site to deliver the most benefits for water quantity, quality and amenity/biodiversity. Where these objectives overlap this is called the SuDS triangle.



**Policy Objective**

**IU 19** To require the use of Sustainable Drainage Systems to minimise and limit the extent of hard surfacing and paving and require the use of SuDS measures be incorporated in all new development (including extensions to existing developments). All development proposals shall be accompanied by a comprehensive SuDS assessment including run-off quantity, run off quality and impacts on habitat and water quality.

**Policy Objective**

**IU 20** To require all development proposals meet the design criteria, (adjusted to reflect local conditions), and material designs contained in the Greater Dublin Strategic Drainage Study (GSDSDS) and demonstrate how runoff is captured as close to source as possible with subsequent slow release to the drainage system and watercourse.

**Policy Objective**

**IU 21** To seek to avoid the discharge of additional surface water to combined sewers and promote Sustainable Urban Drainage Systems (SuDS) and solutions to maximise the capacity of towns with combined drainage systems.

**Policy Objective**

**IU 22** To ensure all new development incorporates appropriate measures to protect existing water bodies, through appropriate treatment of runoff. In particular, discharges from car parks shall be appropriately treated so as to remove pollutant materials.

**Policy Objective**

**IU 23** To ensure all new developments provide for separated drainage systems.

**Policy Objective**

**IU 24** To encourage particularly in buildings of increased height the provision of green roofs and green walls as an integrated part of Sustainable Drainage Systems (SuDS) and which provide benefits for biodiversity, wherever possible.

**10.2.6 Riparian Corridor**

A riparian corridor is the land directly adjacent to or surrounding a natural or artificial waterway and can include major and secondary rivers, wetlands, intermittent or permanent creeks and streams. The width of the riparian corridor may vary along the waterway and is dependent on location within the catchment (valley or floodplain) and the adjacent land use.

These corridors provide a crucial link between terrestrial and stream ecosystems forming a unique and distinct unit within the surrounding landscape and are typically home to a diverse range of plant species.

Where it is necessary to maintain the ecological or environmental quality of a watercourse and in relation to watercourses of a significance conveyance capacity, it is necessary that there is a set back from the edge of watercourses to allow access for channel clearing and maintenance. A minimum setback of at least 10m (or other width, as determined by the Council) will be required on each side of the watercourse, depending on the width of the watercourse.

**Policy Objective**

<b>IU 25</b>	To ensure, where feasible, that no development including clearing or storage of materials takes place within a minimum distance of 10m measured from each bank of any river, stream or watercourse.
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**10.3 FLOOD RISK MANAGEMENT**

Flooding is a natural phenomenon of the hydrological cycle that can occur at any time, in a wide variety of locations, with significant impacts, threatening people’s lives, their property and the environment. Whilst instances of flooding have occurred in Louth, relative to other counties, the extent of this flooding has been low. However, given the reality of climate change, there are areas of the County which are at risk of coastal, fluvial, pluvial and estuarial flooding.

Drainage and flood management are a central theme within the Louth Climate Change Adaptation Strategy 2019-2024, which has an overarching objective to manage the risk of flooding through a variety of responses.

**Coastal Flooding:** Resulting from higher sea levels than normal causing the sea to overflow onto land. Such flooding is influenced by high tide level, storm surges and wave action.

**Pluvial Flooding:** Resulting from high intensity rainfall events where run-off volume exceeds capacity of the surface water network.

**Fluvial Flooding:** Watercourse capacity is exceeded or the channel is blocked and excess water spills from the channel onto adjacent floodplains.

**Estuarial Flooding:** A combination of high tide and high river flows prevents water from flowing out to sea, causing water levels inland to flood river banks.

Like other natural processes flooding cannot be completely eliminated, but its impacts can be minimised, with proactive and environmentally sustainable management of catchments, identifying areas vulnerable to flooding and by taking measures to ensure development does not individually or cumulatively contribute to an increase in flood risk.

With climate change, there is a likelihood of increased rainfall and rising sea levels, which coupled with increased urbanisation means that flood risk to property is likely to increase in the future.

**10.3.1 Flood Risk**

The Preliminary Flood Risk Assessment is a national screening exercise completed by the OPW, based on available and readily derivable information and undertaken to identify areas at potential of flooding.

The PFRA study considered flooding from a number of sources, including fluvial, tidal, pluvial and groundwater and resulted in a national suite of broad scale flood maps.

The PFRA is a requirement of the EU Floods Directive and the publication of the work has led to and informed more detailed assessment, which is being undertaken as part of the Catchment Flood Risk Assessment and Management (CFRAM) studies.

It prioritised the areas of greatest potential risk from one or more sources of flooding and designated these as Areas for Further Assessment (AFA), of which there are eight identified in County Louth. Separate to this, Louth County Council produced the Dunleer Flood Study in 2016, which includes detailed Flood Mapping for Dunleer village.

The OPW undertook the Catchment Flood Risk and Management (CFRAM) programme to elicit a comprehensive picture of flood risk in the AFA’s and identify how to effectively and sustainably manage this flood risk. This culminated in the OPW producing the following:

- Neagh Bann Flood Risk Management Plan; and
- Eastern Flood Risk Management Plan.

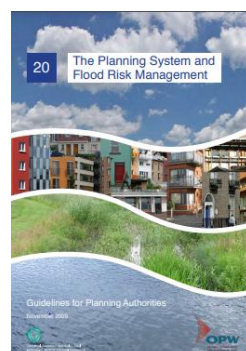
The eight Areas for Further Assessment and their associated Flood Risk Management Plans are as outlined in Table 10.1.

Implementing the measures set out in these plans requires significant capital investment in addition to prioritisation of this investment. Having been allocated funding, and in conjunction with the OPW, the Council is seeking to deliver on the following Flood Relief Schemes during the lifetime of this Plan:

- Dundalk, Blackrock & Ardee Flood Relief Scheme;
- Drogheda & Baltray Flood Relief Scheme; and
- Carlingford & Greenore Flood Relief Scheme.

The Strategic Flood Risk Assessment (SFRA) to be completed during the Plan making process in accordance with [The Planning System and Flood Risk Management Guidelines \(2009\)](#) has been appended to this Plan.

These guidelines follow the principle that certain types of vulnerable development should not be permitted in flood risk areas, particularly flood plains, except where there are no alternative and appropriate sites available in lower risk areas that are consistent with the objectives of proper planning and sustainable development.



**Table 10.1 Areas for Further Assessment and their Associated Flood Risk Management Plan**

Area for Further Assessment (AFA)	Flood Risk and Management Plan (FRAM)
Annagassan	Neagh Bann
Ardee	Neagh Bann
Baltray	Eastern
Carlingford	Neagh Bann
Drogheda	Eastern
Dundalk & Blackrock	Neagh Bann
Greenore	Neagh Bann
Termonfeckin	Neagh Bann

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management. There are three types of flood zones defined in the guidelines. These are outlined in Table 10.2.

The SFRA mapping identifies where Flood Zones A and B are most likely to occur, focusing on the smaller towns and villages throughout the County.

Further mapping illustrates flooding in all urban and rural locations, which facilitates identification of areas within which development proposals will be subject to site specific Flood Risk Assessment.

**Table 10.2: Flood Zone Type**

Flood Zone Type	Description
<b>A</b>	The probability of flooding is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding) and where a wide range of receptors would be vulnerable
<b>B</b>	The probability of flooding is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding)
<b>C</b>	The probability of flooding is low (less than 0.1% or 1 in 1000 for both river and coastal flooding)

**Policy Objective**

<b>IU 26</b>	<p>To reduce the risk of new development being affected by possible future flooding by:</p> <ul style="list-style-type: none"> <li>• Avoiding development in areas at risk of flooding and</li> <li>• Where development in floodplains cannot be avoided, taking a sequential approach to flood risk management based on avoidance, reduction and adaptation to the risk.</li> </ul>
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**Policy Objective**

<b>IU 27</b>	<p>To ensure all proposals for development falling within Flood Zones A or B are consistent with the “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” 2009. Proposals for development identified as being vulnerable to flooding must be supported by a site specific Flood Risk Assessment and demonstrate to the satisfaction of the Planning Authority that the development and its infrastructure will avoid significant risks of flooding and not exacerbate flooding elsewhere.</p> <p>In Flood Zone C, where the probability of flooding is low (less than 0.1%), site-specific Flood Risk Assessment may be required and the developer should satisfy themselves that the probability of flooding is appropriate to the development being proposed.</p> <p>The County Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping should be consulted by prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council.</p> <p>Applications for development in flood vulnerable zones, including those at risk under the OPW’s Mid-Range Future Scenario, shall provide details of structural and non-structural risk management measures, such as those relating to floor levels, internal layout, flood-resilient construction, emergency response planning and access and egress during flood events.</p>
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**Policy Objective**

<b>IU 28</b>	<p>To require development proposals within the settlement boundary of Dundalk to comply with the requirements of Policy Objective INF 21 of the Dundalk Local Area Plan 2025-2031.</p>
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**Policy Objective**

<b>IU 29</b>	<p>Where a site specific Flood Risk Assessment demonstrates that there are significant residual flood risks to a proposed development or its occupiers in conflict with ‘The Planning System and Flood Risk Management – Guidelines for Planning Authorities’ 2009, planning permission will normally not be granted unless the requirements of Section 5.28 ‘Assessment of minor proposals in areas of flood risk’ can be satisfied.</p>
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**Policy Objective**

<b>IU 30</b>	<p>To implement the Flood Risk Management Measures as detailed in the Neagh Bann Flood Risk Management Plan, the Eastern Flood Risk Management Plan and the Dunleer Flood Risk Management Plan, ensuring that proposals for development support and do not impede the progression of these measures. Louth County Council will, in partnership with the Office of Public Works (OPW) deliver the following Flood Relief Schemes:</p> <ul style="list-style-type: none"> <li>• Dundalk, Blackrock and Ardee;</li> <li>• Drogheda and Baltray; and</li> <li>• Carlingford and Greenore.</li> </ul>
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**Policy Objective**

**IU 31** To work with the Office for Public Works in the development and implementation of catchment-based strategies for the management of flood risk – including those relating to storage and conveyance.

**Policy Objective**

**IU 32** To contribute towards the improvement and/or restoration of the natural flood risk management functions of flood plains subject to compliance with the environmental legislation and availability of resources.

**Policy Objective**

**IU 33** To ensure each flood risk management activity is examined to determine actions required to embed and provide for effective climate change adaptation as set out in the OPW Climate Change Sectoral Adaptation Plan Flood Risk Management applicable at the time.

**Policy Objective**

**IU 34** Where a portion of a site is at risk of flooding, the lands at risk will be subject to the sequential approach to ensure first and foremost that new development is directed towards lands at low risk of flooding; and to restrict the type of development to that ‘appropriate’ to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines.

**Policy Objective**

**IU 35** To consult with the Office of Public Works (OPW) in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible.

**Policy Objective**

**IU 36** To consult with the Office of Public Works (OPW) in relation to proposed developments which include the construction, replacement or alteration of a bridge or culvert and to require that the developers obtain consent from the OPW under *Section 50 of the EU (Assessment and Management of Flood Risks) Regulations 2010* and *Section 50 of the Arterial Drainage Act 1945*, where appropriate.

### 10.3.2 PFRA Mapping

PFRA mapping has been used to define the flood zones in places outside of the scope of the CFRAM Study and the Dunleer Flood Study. These areas should be treated with caution due to the indicative nature of the PFRA mapping. It is provided for information purposes to help identify areas where flood risk should be explored in greater detail. For this reason, all Zoning and Composite Mapping for each of the Settlements associated with the Development Plan clearly differentiate between flood zones derived from PFRA mapping and the CFRAM Study, on the attached legend. Any planning application on lands where pluvial flooding is identified will be required to include an assessment of the potential flood risks associated with the development of the lands together with any mitigating measures that will ensure the development and associated infrastructure will avoid significant risks of flooding and not exacerbate flooding elsewhere.

## 10.4 COMMUNICATIONS

### 10.4.1 Introduction

Information and Communication Technologies (ICT) is a term used to cover the technical means of processing and communicating information, primarily involving digital technology.



The importance of ICT is recognised in two ways. Firstly, access to fast, reliable and cost effective communications offsets the impact of geographic remoteness, increasing social inclusion, economic competitiveness and employment opportunities.

Secondly, it can contribute to sustainability goals by reducing the need to travel e.g. home working which provides for a better home life balance with fewer car journeys and reduced greenhouse gas emissions. With respect to Telecommunication Technologies, the Council acknowledges its importance and seeks to promote and facilitate widespread telecommunication infrastructure throughout the County in order to achieve balanced social and economic development.

The Council will promote the development of additional ICT infrastructure including broadband, telecommunication facilities, mobile phone coverage etc., to provide for the physical and economic development of County Louth subject to normal planning considerations.

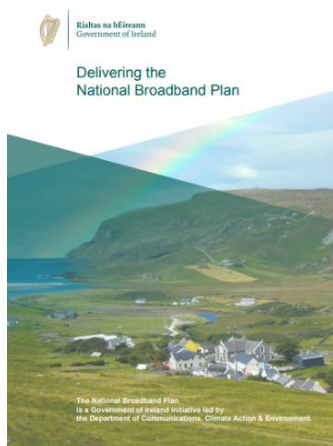
Policy Objective	
<b>IU 37</b>	To promote and facilitate the sustainable delivery of a high quality ICT infrastructure network throughout the County taking account of the need to protect the countryside and the urban environment together with seeking to achieve balanced social and economic development.

## 10.4.2 Broadband Infrastructure

High speed, cost competitive and reliable broadband underpins economic development. It is increasingly recognised as a critical piece of infrastructure enabling businesses adopt innovative technologies, more flexible working patterns and to trade online.

Its absence makes it significantly more difficult to retain existing employment, attract new jobs and develop new enterprise opportunities.

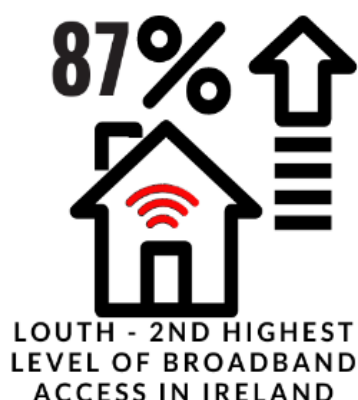
The implementation of high speed broadband connectivity falls within the remit of the Department of the Environment, Climate and Communications (formerly the Department of Communications, Energy and Natural Resources) which, in 2012 published *Delivering a Connected Society – A National Broadband Plan for Ireland (NBP)*. This is the Government's initiative to radically changing the broadband landscape of Ireland and delivering high speed, reliable and cost effective broadband services to all premises in the country.



The NBP will deliver this through a combination of private industry investment and state intervention (known as the Intervention Strategy), to those parts of the country where private companies have no plans to invest.

By signing the contract for the delivery of the *National Broadband Plan in 2019*, the Government guaranteed that rural communities would have the same opportunities as urban areas. The optimum way for telecommunication services to be delivered is via fibre optic based networks.

The deployment of such networks drives the level of high speed broadband penetration in an area. County Louth has 5 no. Open Access Network Specialists and Wholesale Providers, (eNET/MANS, SIRO, Open Eir, Viatel and BT). Virgin Media Ireland has also developed two high speed proprietary broadband networks in Drogheda and Dundalk.



Due to the recent fibre optic network deployments by these commercial providers, County Louth has the second highest level of broadband access in Ireland at 87% of premises.

Under the NDP, the remaining 13% of premises, which fall into the State Intervention Area, will be provided with access to high speed broadband.

Louth continues to benefit from the rollout of several Government led broadband schemes, ensuring broadband services are available in communities across the County.

One such scheme which benefits County Louth, is Broadband Connection Points (BCPs). These are public locations (public buildings/sites) which will receive 150Mb high speed broadband connectivity and where public Wi-Fi will be provided, allowing people in the area to make use of broadband as and when required. Nine such sites were identified in County Louth.

#### 10.4.2.1 Metropolitan Area Networks (MANS)

This is a network of ducting and fibre optic cable laid within a metropolitan area, which can be used by a variety of businesses and organisations to provide services including, but not limited to telecoms, television and internet. While MANS are publically owned (managed by eNET), they allow all telecommunication service operators (retailers) open access to the network. MANS, to date has been provided in Drogheda, Dundalk and Ardee. The availability of broadband in promoting these centres to potential employment generating investors is deemed to be critical.

#### 10.4.2.2 Louth Broadband Action Plan

The Louth Economic Forum (LEC) devised an overall 10 Point Plan, identifying 10 specific areas to be addressed within its work programme.

This included high speed broadband in recognition of its importance in underpinning economic growth. The aim of the Action Plan is to continue significant progress and advance broadband to rural areas in accordance with the National Broadband Plan.

Both Drogheda and Dundalk have six high speed broadband infrastructure providers/wholesalers, enabling a variety of telecom retailers to offer up speeds to 1000Mbps to businesses and consumers.

Ardee and Dunleer have access to high speed broadband for premises in those towns.

Approximately 22% of the premises on the outskirts of the two towns will require state intervention under the NBP. Regarding the Level 3 and 4 Settlements, approximately 66% of the premises have access to high speed broadband with the remaining 34% requiring state intervention under the NBP.

#### Policy Objective

<b>IU 38</b>	To support the delivery and implementation of the National Broadband Plan.
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#### Policy Objective

<b>IU 39</b>	To secure the rollout of high quality broadband and telecommunication infrastructure throughout the County and facilitate its expansion in remote rural areas, in the interest of promoting economic growth, competitiveness and social inclusion.
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#### Policy Objective

<b>IU 40</b>	To co-operate with the relevant agencies to facilitate the undergrounding of all electricity, telephone and television cables in urban areas wherever possible, in the interests of visual amenity.
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### 10.4.2.3 Open Access Ducting

With the support of the Louth Broadband Action Plan, the Council will require that open access is made available to all ducting networks provided within the Plan area, in support of a competitive telecommunications services and to safeguard roads and footpaths from excavation. The networks will remain in the ownership of the developer until taken in charge by the Council.

Thereafter, the service provider will be responsible for the telecommunications infrastructure.

The Council will require, by way of condition attached to a permission, that the service provider enter an agreement with the Council to ensure that open access, at an economic cost, is provided.

#### Policy Objective

<b>IU 41</b>	To require open access ducting for new developments is made available to all service providers on a non-exclusive lease basis at an economic cost.
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### 10.4.2.4 Telecommunications Support Structures and Antennae:

The Council recognises the importance of high quality telecommunication infrastructure as a prerequisite for a successful economy and accepts the critical importance of a high quality telecommunications service at national, regional and local level.

#### Policy Objective

<b>IU 42</b>	To ensure the orderly development of telecommunications throughout the County in accordance with the requirements of the <i>Telecommunications Antennae and Support Structures, Guidelines for Planning Authorities, DECLG, 1996</i> , except where they conflict with Circular Letter PI07/12 which shall take precedence, and any subsequent revisions or expanded guidelines in this area.
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Deregulation of the telecommunications industry has resulted in both choice and competition in conjunction with duplication and over provision of facilities. While the advantages of a high quality ICT infrastructure are acknowledged, these must be balanced against the need to safeguard both the urban and rural landscape, which can be significantly impacted due to the physical nature of these structures.

Visual impact should be kept to a minimum with detailed consideration of design, siting and scope for utilising landscaping measures effectively.

In considering planning applications, regard will be had to *Telecommunications Antennae and Support Structures, Guidelines for Planning Authorities, DECLG, 1996*, Circular Letter PI07/12 and the *Planning and Development Regulations 2001 (as amended)*.

These guidelines and regulations encourage the sharing or clustering of sites, which will be reflected in Council policy.

Further guidance on the design and development of Telecommunications Structures Details is provided for in Chapter 13, Section 13.18.3.

**Policy Objective**

<b>IU 43</b>	To require co-location of antennae support structures and sites where feasible. Operators shall be required to submit documentary evidence as to the non-feasibility of this option in proposals for new structures.
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**Policy Objective**

<b>IU 44</b>	To facilitate the public and private sector in making available where feasible and suitable, strategically located structures or sites, including those in the ownership of Louth County Council, to facilitate improved telecommunications coverage.
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**Policy Objective**

<b>IU 45</b>	To require best practice in both siting and design in relation to the erection of communication antennae and support infrastructure, in the interests of visual amenity and the protection of sensitive landscapes.
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**Policy Objective**

<b>IU 46</b>	To operate a presumption against the location of antennae support structures where they would have a serious negative impact on the visual amenity of sensitive sites and locations.
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**Policy Objective**

<b>IU 47</b>	To require the de-commissioning of a telecommunications structure and its removal off-site at the operator's expense where it is no longer required.
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**Policy Objective**

<b>IU 48</b>	To encourage service providers to engage in pre-planning discussions with the Planning Authority prior to the submission of planning applications.
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**10.4.2.5 Domestic Satellite Dishes**

If inappropriately sited, satellite dishes can materially harm the character and appearance of historic buildings, important townscapes and the character of rural areas. While satellite dishes can be erected subject to specified conditions

and limitations under the *Planning and Development Regulations 2001 (as amended)* these provisions are not applicable where the dwelling is a Protected Structure or sited within an Architectural Conservation Area (ACA).

**Policy Objective**

<b>IU 49</b>	To prohibit satellite dishes where they would materially harm the character and appearance of a Protected Structure, an Architectural Conservation Area (ACA) or in any other area where they could cause unacceptable harm to the visual amenity.
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## 10.5 ENERGY

### 10.5.1 Introduction

Energy is an essential component of Ireland’s economy and society. Continued growth in County Louth, with respect to both population and the economy, will require energy to power businesses, homes, transport and public services.

A reliable, resilient and efficient energy system that caters for growth year round and across all sectors, will be required to underpin the future development of the County.

Louth requires world class energy infrastructure which is fit for purpose and, in this regard, our native renewable energy sources need to be developed. Such development will reduce dependence on fossil fuels and external sources, improve energy mix and provide a secure and resilient supply, reduce greenhouse gas emissions creating environmental benefits and protect against climate change.

A reduction in our dependence on foreign fossil fuels will simultaneously provide positive social, economic and environmental dividends.

Renewable energy can be defined as energy developed from sources that are constantly replenished through the cycles of nature and unlike fossil fuels, are not finite. International, European and National policies all seek and support a more energy efficient society relying on sustainable renewable energy sources.

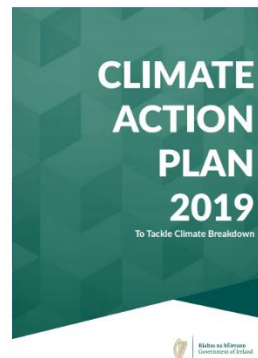
This Plan promotes energy efficiency and the development of indigenous renewable resources. The Development Plan can progress a sustainable energy future for the County, by recognising the importance of land use and transportation planning in promoting a low carbon society and mitigating the impacts of climate change.

### 10.5.2 Renewable Energy

Ireland’s geographic location on the western edge of Europe accentuates our need for secure and continuous energy supplies, especially where our expenditure on energy imports remains significant. National policies promoting energy efficiency and sustainable renewable energy sources will ensure we secure our international competitiveness by increased use of and demand for indigenous resources and increased security of supply.

The Government supports the adoption of a net zero target by 2050 at EU level.

The *Climate Action Plan 2019* puts in place a decarbonisation pathway to 2030, which would be consistent with the adoption of a net zero target in Ireland by 2050.



From a national perspective, to achieve the target of 70% renewable electricity by 2030, the '*Climate Action Plan*' 2019 identifies that to meet the required level of emissions reduction by 2030 that certain identified targets need to be met and which are detailed in Figure 10.1 below. This will involve phasing out coal- and peat-fired electricity generation plants, increasing renewable electricity, reinforcing the grid and putting systems in place to manage intermittent sources of power, especially from wind.

The Council acknowledges that it is critically important that it plays its part in realising national targets and this will be achieved through the inclusion of supporting policy objectives for renewable energy generation and development and through the preparation of a Renewable Energy Strategy.

**Figure 10.1**

To meet the required level of emissions reduction, by 2030 we will:

- Reduce CO<sub>2</sub> eq. Emissions from the sector by 50-55% relative to 2030 Pre-NDP projections
- Deliver an early and complete phase-out of coal- and peat fired electricity generation
- Increase electricity generated from renewable sources to 70%, indicatively comprised of:\*
  - At least 3.5 GW of offshore renewable energy
  - Up to 1.5 GW of grid-scale solar energy
  - Up to 8.2 GW total of increase onshore wind capacity
- Meet 15% of electricity demand by renewable sources contracted under Corporate PPA's

[\*The exact level of offshore wind, onshore wind, solar and other renewable technology will be determined by a new system of competitive auctions where the lowest cost technology will be determined, see box below.]

The National Planning Framework establishes a single vision for all communities in accordance with 10 shared goals identified as National Strategic Outcomes and herein NSO 8 recognises the national objective of achieving a transition to a competitive, low carbon, climate resilient and environmentally sustainable economy by 2050. This recognises that new energy systems and transmission grids will be necessary for a more distributed, renewables-focused energy generation system, harnessing the considerable onshore and off shore potential from a range of energy sources including wind, wave and solar and connection to major sources of demand.

The Council in the Plan will seek to support the NPF in harnessing the potential of the Eastern and Midland Region in renewable energy terms across the technological spectrum in helping to realise national targets.

The Eastern and Midland Regional Spatial and Economic Strategy recognises the need to shift from a reliance on fossil fuel usage to a more diverse range of low and zero carbon sources, thereby supporting an increase in renewable energy sources across the technological spectrum within the Region.

EMRA seeks to identify, in conjunction with its constituent Local Authorities within the Region, Strategic Energy Zones (SEZ) as areas suitable for larger energy generating projects, the role of community and micro energy production in urban and rural settings and the potential for renewable energy within industrial areas.

This would contribute to the delivery of the targets set in the '*Climate Action Plan*' in respect of renewable energy.

The SEZ will ensure all environmental constraints are addressed in the analysis. The need for early stakeholder engagement is critical as effective community engagement is essential for building public confidence and helping the country, the Region and the County in achieving a transition to renewable energy.



The renewable energy options for County Louth include the following:

- Wind Energy (onshore and offshore);
- Solar Energy;
- Water Energy (hydro, wave and tidal);
- Heat Pump Systems (including geothermal);
- Bioenergy; and
- Waste Material.

At a national level, much of the growth in renewable energy has been derived from wind energy but Ireland has significant further renewable energy resource potential, which includes for solar, tidal, bioenergy and wave.

The Government is investigating opportunities to develop Ireland's abundant offshore renewable energy resources including offshore wind, wave and tidal energy in recognition of their rich potential offering in the coming decades. Given its coastal location, Louth has a clear part to play in the development of renewable energy and the provision of such alternative energy resources will be considered on suitable sites throughout the County.

The Council recognises the range of new and developing technologies that can contribute to minimising greenhouse gas emissions, providing a secure and stable energy supply and securing a greater proportion of our energy from renewable sources.

In 2017 the Department of Housing, Planning, Community and Local Government published '*Interim Guidelines for Planning Authorities on Statutory Plans, Renewable Energy and Climate Change*' under Section 28 of the Planning and Development Act 2000 (as amended) which included a Specific Planning Policy Requirement concerning policies or objectives that relate to wind energy developments and requirements of planning authorities in this regard.

In considering renewable energy the Council has had regard to the following documentation;

- The National Renewable Energy Action Plan 2010 (Irish Government submission to the European Commission);
- The Government's Strategy for Renewable Energy 2012 – 2020 (DCENR);
- The Government's White Paper on Energy Policy - Ireland's Transition to a Low Carbon Energy Future 2015-2030 (DCENR); and
- The Government's National Mitigation Plan, July 2017 (DCCA).

In relation to renewable energy, the Council will consider full legislation provision and supporting guidance, policy documents etc. issued by the relevant department to give effect to legislative provisions.

### 10.5.2.1 Energy Efficiency

The Council supports the concept of generating renewable energy at a ‘local’ level and is cognisant of the benefits that consequently accrue to local communities.

Local community engagement will form a key part of the Council’s future energy strategy, to inform people of the economic, environmental and social benefits of moving away from solid/fossil fuels towards a low carbon economy.

The Council will endeavour to:

- Promote the rational use of energy;
- Promote renewable energy;
- Promote and disseminate energy information;
- Protect the environment;
- Reduce energy waste in all sectors of society; and
- Encourage the replacement of imported fossil fuels with regionally generated renewable energy in an effort to ensure security of energy supply, where it is feasible.

### 10.5.2.2 Louth Sustainable Energy Action Plan

The Louth Economic Forum devised an overall 10 point plan which identified 10 specific topics to be addressed within its work programme.

This included a Sustainable Energy Action Plan, the objective of which is to help sustain, support and create jobs through developing the concept of Louth as a leader in the delivery of the Green Economy.

Its objectives include building on and replicating sustainable energy best practices developed in Dundalk to elsewhere in the County, assisting local business to be competitive through energy efficiency supports and allowing green businesses use County Louth as a living laboratory to develop their products and services.

### 10.5.2.3 Renewable Energy Strategy

Louth County Council is committed to supporting investment in renewable energy and to developing a robust and sustainable Renewable Energy Strategy (RES) for the County. It will be informed by and aim to deliver on the *Climate Action Plan 2019* targets (and any revisions thereto) and position the County as a leader in renewable energy generation, supporting energy efficiency and conservation.

The RES will outline the potential for a range of renewable resources, including inter alia onshore and offshore wind, solar, bioenergy, geothermal, hydro, wave and tidal energy. It will establish baseline data and set out the renewable energy resource targets for the County to 2027, seeking a sustainable balance of renewable energy sources. Consistent with the Development Plan the RES will acknowledge the contribution that can be made to Louth being more energy secure, less reliant on traditional fossil fuels and meeting assigned national targets.

#### Policy Objective

<b>IU 50</b>	To support international, national and County initiatives for limiting and reducing emissions of greenhouse gases through energy efficiency and the development of renewable energy sources at suitable locations, utilising the natural resources of the County, in an environmentally acceptable manner subject to normal proper planning considerations including in particular the impact on areas of environmental or landscape sensitivity.
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**Policy Objective**

**IU 51** To co-operate with the appropriate authorities both north and south of the border in the provision of all-island renewable energy.

**Policy Objective**

**IU 52** To support initiatives aimed at reducing the level of energy consumption within the County.

**Policy Objective**

**IU 53** To produce a Renewable Energy Strategy for County Louth within one year of adoption of the Revised Wind Energy Guidelines. This strategy shall have regard to ‘*A Methodology for Local Authority Renewable Energy Strategies*’, (SEAI) and shall be compliant with the requirements of the SEA & Habitats Directives.

**Policy Objective**

**IU 54** To support the identification, in conjunction with EMRA, of Strategic Energy Zones, areas suitable to accommodate large energy generating projects within the Eastern and Midland Region.

**Policy Objective**

**IU 55** To support Sustainable Energy Communities and Local Community Group Initiatives to develop clean energy opportunities within the County.

**Policy Objective**

**IU 56** To support the implementation of the EU Green Deal, *Climate Action Plan 2019* (or any subsequent plan), *Programme for Government 2020*, *Climate Change Adaptation Strategy for County Louth* and the Climate Action Charter and facilitate measures which seek to reduce emissions of greenhouse gases.

## 10.6 WIND ENERGY

Wind energy is currently the largest contributing resource of renewable energy in Ireland and is both Ireland’s largest and cheapest renewable electricity resource. In 2018 wind provided 85% of Ireland’s renewable electricity and 30% of our total electricity demand. Ireland is one of the leading countries in its use of wind energy, which is the second greatest source of electricity generation after natural gas.

The Council recognises the significant contribution that wind energy can make as a clean sustainable solution to energy requirements and its vital role in helping achieve national targets in relation to fossil fuel reductions and consequently greenhouse gas emissions. In the next decade, onshore wind will continue to be Ireland’s main source of renewable energy.

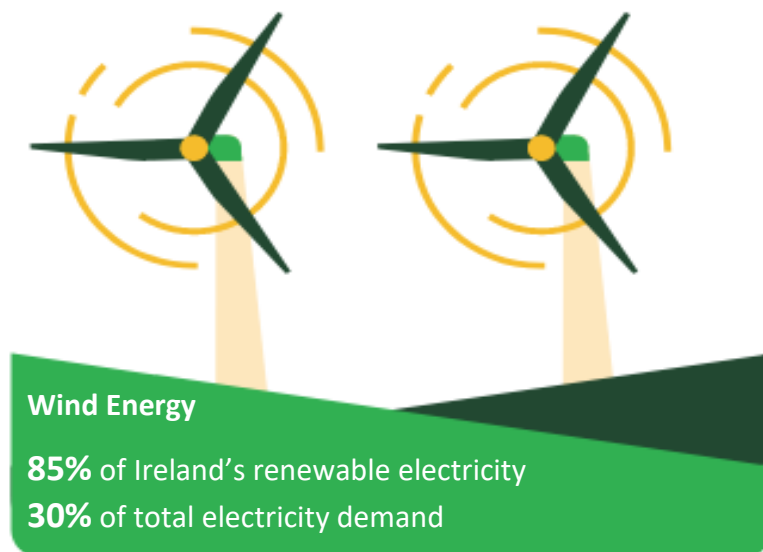
Such a radical shift away from our current reliance on fossil fuels will require significant changes nationally to the grid, existing infrastructure, legislation and the regulatory framework.

These changes are necessary and crucial if the country is to move to a more sustainable energy system.

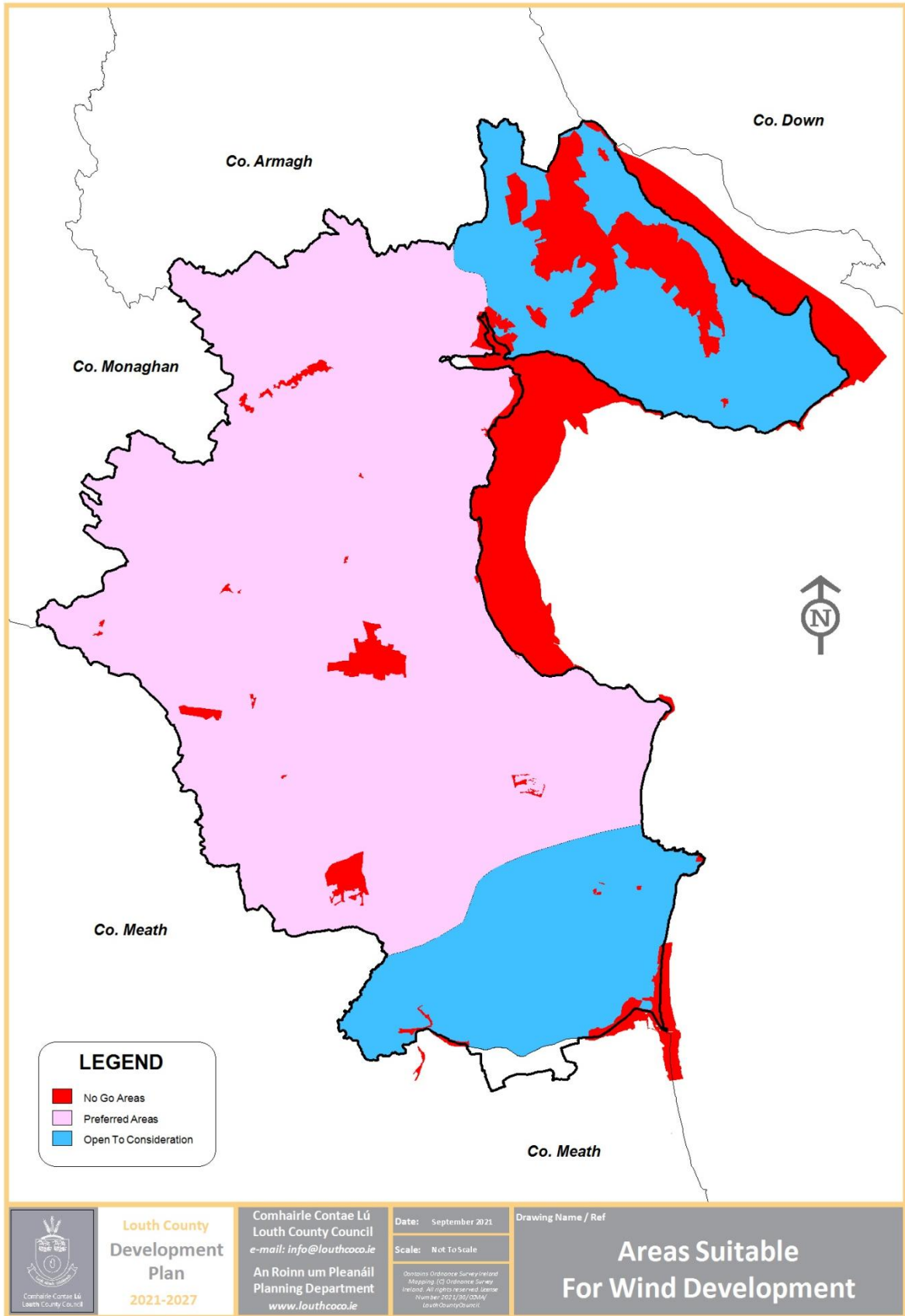
The Council will continue to support and encourage the principle of wind energy development in accordance with Government policy and having regard to the Wind Energy Development Guidelines for Planning Authorities or any update made thereto during the lifetime of the Plan.

A Wind Energy Strategy will be an intrinsic element of the Renewable Energy Strategy and will be informed by the targets for onshore wind capacity as set out in the *Climate Action Plan 2019* (8.2 GW of increased onshore wind capacity), targets which the Council will want to successfully help to achieve.

The Council is also mindful of Louth’s diverse landscapes with varying degrees of sensitivity to wind energy generating infrastructure and therefore care will need to be exercised in the location and siting of such infrastructure.



Map 10.1: Areas suitable for Wind Development



### 10.6.1 Off Shore Wind Development

Louth, with its considerable coastal extent presents significant opportunities for economic development in servicing off-shore wind developments. The Climate Action Plan 2019 expects the connection of at least 3.5GW of offshore renewable energy to the grid by 2030. An off shore wind energy strategy will be an integral part of the Renewable Energy Strategy.



#### Policy Objective

**IU 57** To encourage the development of wind energy, in accordance with Government policy and guidance and the *'Wind Energy Development Guidelines' (2006)* or any revisions thereof which may be issued during the lifetime of the Plan.

#### Policy Objective

**IU 58** To facilitate the development of wind energy in an environmentally sustainable manner ensuring 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.

#### Policy Objective

**IU 59** To promote the location of wind farms and wind energy infrastructure in the 'preferred areas' as outlined on Map 10.1, to prohibit such infrastructure in areas identified as 'no-go areas' and to consider, subject to appropriate assessment, the location of wind generating infrastructure in areas 'open for consideration'.

#### Policy Objective

**IU 60** To favourably consider small scale wind energy development for auto-consumption purposes, that accord with the proper planning and sustainable development of the area including residential amenity, heritage, environmental and landscape impacts.

#### Policy Objective

**IU 61** To support the development of off shore windfarm developments subject to normal planning considerations, including in particular the impact on areas of environmental or landscape sensitivity.

#### Policy Objective

**IU 62** To ensure that terrestrial developments along the coastline provide adequate provision for connection to the national grid for off-shore wind farms.

#### Policy Objective

**IU 63** To support the repowering/life extension of wind turbines where appropriate and subject to normal proper planning considerations.

**Policy Objective**

<b>IU 64</b>	The Council will determine how the implementation of the Plan over its effective period will contribute to realising overall national targets on renewable energy and climate change mitigation, and in particular wind energy production and the potential wind energy resource (in megawatts), within 6 months of making the Plan.
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**10.7 SOLAR ENERGY**

As solar energy technology has become more effective, more northerly countries like Ireland, have become viable for technology including solar panels and solar farms with storage facilities. As a result, solar energy is increasingly contributing to a reduction in energy demand and energy costs for a range of commercial, residential and industrial properties.

There are three main forms of solar energy, which are:

- Passive Solar (e.g. Building Design);
- Solar Thermal (e.g. direct solar water heating); and
- Active Solar (e.g. generation of electricity through photovoltaic cells).

Passive solar heating relies on the manner in which buildings are designed to maximise solar gain and minimise heat loss through a combination of factors including layout, orientation and materials. Solar thermal heating involves the use of solar panels to transform solar energy to heat and provide water and/or space heating. Both offer significant potential to generate heat from solar energies.

Photovoltaic (PV) systems use daylight to convert solar radiation into electricity and this technology can be used for domestic as well as larger industrial or commercial applications. The Council will support and facilitate the development of solar energy, encourage passive solar design, solar PV, and solar water heating in new buildings and in retrofitting buildings.

Solar energy like all forms of renewable energy technology is constantly evolving. Solar farms have the potential to affect the landscape and natural and built heritage.

When assessing planning applications for solar energy, development proposals shall have regard *inter alia* to:

- Landscape Character of County;
- Site contours and levelling on site;
- Site suitability: Brownfield lands or poor agricultural lands;
- Visual and landscape impact;
- Ecology ;
- Heritage;
- Glint & glare;
- Ground maintenance, soil stripping, storage and maintenance;
- Fencing, security & lighting;
- Drainage; and
- Decommissioning.

**Policy Objective**

<b>IU 65</b>	To support the development of solar energy infrastructure in the County including commercial scale ground mounted solar PV 'Solar Farms' subject to environmental safeguards and the protection of natural and built heritage features, biodiversity and views and prospects.
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**Policy Objective**

<b>IU 66</b>	To encourage and support the development of solar energy infrastructure for on-site energy use, including solar PV, solar thermal and seasonal storage technologies.
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### 10.7.1 Heat Pump Systems

The *National Climate Action Plan 2019* has a stated installation target of 600,000 heat pumps nationally by 2030, two-thirds of which are to be retro-fitted into existing properties. This equates to 15,800 heat pumps in Louth on a pro-rata population basis.

Heat-pumps are electrical devices which convert energy from the air outside into useful heat and where a building is well insulated, they are very economical to run and an extremely efficient alternative to oil, gas, solid fuel and electric heating systems. Different types of heat pump systems extract heat from different sources: air, water or the ground. Heat generated is released via radiators, underfloor heating or warm air.

There are many variants such as Air to Water, Ground Source to Water, Exhaust Air to Water, Water to Water and Air to Air. These can be broadly divided into three classes:

**Air Source:** The most common heat pump systems extract heat from external air, typically using an outside unit. These heat pump systems do not require underground piping to source heat and so can be cheaper and easier to install compared to ground source heat pump systems. The most popular heat pumps are air to water heat pumps.

**Ground Source (Geothermal):** A ground-source heat pump system uses the earth as a source of renewable heat. Heat is removed from the ground through collector pipework and then transferred to the heat pump. The ground collector can be laid out horizontally at a shallow depth below the surface or else vertically to a greater depth.

**Water Source:** Water source heat pump systems use open water, such as lakes, rivers or streams, as a heat source.

Heat is removed from the water through collector pipework and then transferred to the heat pump.

Policy Objective	
<b>IU 67</b>	To encourage and support the development and promote the use of heat pumps for heating domestic, commercial and recreational buildings and water subject to normal planning and environmental considerations.

### 10.8 BIOENERGY

Bioenergy is the term used to denote renewable energy derived from biomass. Biomass is defined as the biodegradable proportion of products, waste and residues from agriculture, forestry, and related industries and the biodegradable fraction of industrial and municipal waste. It is a renewable indigenous source of fuel for electricity, heat, transport and fuel.

Projects involving the combustion of biomass can range from domestic boilers to industrial installations.

The principle feedstocks are wood chip and wood pellets, energy crops and the combustion of municipal waste in waste to energy facilities.

Biofuels may be defined as liquid or gaseous fuels for transport, which are produced from biomass such as oilseed rape. Biogas, (when subjected to suitable processing) can be injected into the natural gas grid to complement or substitute natural gas and can also be compressed and used as transport fuel.

The advantages of Bioenergy include *inter alia*, security and diversity of supply, alternative farming opportunities, employment generation and potential to reduce greenhouse emissions.

The Council will promote renewable gas and support investment in the sustainable development of an agricultural biogas sector and assist in the integration of renewable gas into the grid network.

**Policy Objective**

**IU 68** To support and promote the development of projects that convert biomass to energy subject to proper planning and environmental considerations.

**Policy Objective**

**IU 69** To direct commercial bioenergy plants to locate on lands reserved for industrial use, brownfield sites adjacent to industrial areas, or brownfield sites in the rural area (including existing farmyards) which are served by a good public roads network to absorb increased traffic movements.

**10.8.1 Biogas Generation**

Renewable Gas, often referred to as bio-methane, is a clean, renewable and carbon neutral fuel and it can be produced from a range of feedstocks. Its potential is as a renewable fuel in all energy sectors; for heat, electricity and transport and thus contributing to Ireland’s decarbonisation, renewable energy and energy security objectives.



Ireland has the highest potential for Renewable Gas production per capita in Europe with a potential of 13TWh achievable by 2030, according to EU Commissioned report ‘*Optimal use of biogas from waste streams An assessment of the potential of biogas from digestion in the EU beyond 2020*’.

**Policy Objective**

**IU 70** To support and promote the development of bio-gas production and networking technologies at suitable locations and subject to normal planning and environmental considerations.

**10.8.2 District Heating**

Ireland has one of the lowest shares of district heating in Europe at less than 1% of the heat market. District Heating can play a key role in improved energy efficiency and emissions reduction through the use of low carbon energy resources, improvements in energy conversion efficiency through, for example, CHP (Combined Heat and Power) and capturing low value heat resources which would otherwise go to waste.

Public bodies are identified as key enablers of district heating, particularly where larger scale co-ordination of projects is required among diverse stakeholders. The development of district heating will require coordinated, local-level action to effectively plan for successful widespread district heating implementation.

In accordance with RPO 7.38 of the RSES, Louth County Council will utilise heat mapping to support developments which deliver energy efficiency and the recovery of energy that would otherwise be wasted.

Further, the Council will carry out a feasibility assessment for district heating within its functional area and shall identify local waste heat sources.

Policy Objective	
<b>IU 71</b>	Facilitate and promote District Heating installation where practical through the County, while protecting residential amenity.

Policy Objective	
<b>IU 72</b>	To ensure the use of heat mapping to inform the best and justifiable location for district heating schemes.

Policy Objective	
<b>IU 73</b>	The Council will carry out a feasibility assessment for district heating schemes and shall identify local waste heat sources accordingly.

## 10.9 HYDRO ENERGY

Where suitable, the use of rivers for the development of Hydro Energy will be encouraged by the Council to play a part in the County’s renewable energy mix. In particular, the Council will be supportive of individual developments along the banks of rivers, which propose hydro energy to provide an element of their energy requirements, all subject to environmental considerations.

Policy Objective	
<b>IU 74</b>	To support the sustainable development of hydroelectric projects on rivers and lakes where they do not have an ecological impact on any sites of EU or national designation and/or impact negatively on freshwater species and the free passage of fish.

### 10.9.1 Tidal and Ocean Energy

Although situated along the east coast of the country, there is no doubt that potential exists in the waters off Louth’s coast. Realisation of this resource will depend on the cost effectiveness of wave energy technology, the amount of power which can practically be connected to the grid and the capacity available on the network. While proposals below the water mark lie outside the Council’s jurisdiction, on-shore ancillary plant, buildings and power lines will require assessment and all on-shore impacts must be mitigated to the greatest extent possible. In this regard, detailed visual and environmental considerations of any development proposal will be assessed in determining their acceptability.



In 2012, *Our Ocean Wealth – An Integrated Marine Plan for Ireland* (DAFM) was a strategy aiming to introduce ocean energy into Ireland’s renewables portfolio wherein tidal energy is recognised as an important element. Carlingford and the Boyne Estuary may have potential for the generation of tidal energy.

**Policy Objective**

<b>IU 75</b>	To support the development of wave and tidal energy in suitable waters off the coast of County Louth subject to the protection of important marine habitats and acceptable visual and environmental considerations.
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**10.10 SMALL SCALE RENEWABLE ELECTRICITY GENERATION**

With the development of new technologies, the generation of electricity on a small scale from renewable or low carbon sources is becoming more viable. Small scale installations are available in the form of PV cells (solar panels), single stand alone or wall mounted wind turbines and biomass converters. The *Planning and Development Regulations 2001 (as amended)* set out exemptions for certain small scale renewable installations. The installation of any class of micro renewable technology that does not fall within the exemptions requires planning permission.

**Policy Objective**

<b>IU 76</b>	To promote and facilitate the development of small scale electricity generation installations and green technologies which do not negatively impact on environmental quality, landscape, wildlife and habitats and residential amenities.
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**10.10.1 Energy Supply and Infrastructure**

The Council acknowledges the need to utilise electricity for commercial and domestic use within the County. Notwithstanding the Council’s desire to promote the growth in renewable energy alternatives, the majority of the County’s energy is generated from non-renewable sources such as natural gas, burning of coal, oil and peat.

This energy is transferred around the country on the national grid transmission infrastructure.

The development of a secure and reliable transmission network is critical to ensuring that Louth has the necessary infrastructure to accommodate and promote economic growth, attract investment to the area and facilitate the development of the County in line with the Core and Settlement Strategies.

**Policy Objective**

<b>IU 77</b>	To require that in all new developments, local services such as electricity be undergrounded where possible and appropriate.
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**Policy Objective**

<b>IU 78</b>	To seek to avoid the sterilisation of lands proximate to key public transport corridors such as rail routes when future energy transmission routes/pipelines are being designed and provided.
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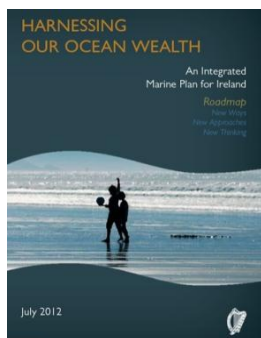
### 10.10.2 Electricity Supply and Infrastructure

EirGrid is responsible for the safe, secure and reliable transmission of electricity – both now and into the future. It develops, manages and operates the electricity transmission grid, which brings power from where it is generated to where it is needed throughout the country.

The grid also supplies power to industry and businesses that use large amounts of electricity and powers the distribution network.

The distribution network in turn supplies electricity to homes, businesses, schools, hospitals, etc. The transmission system on the island of Ireland refers to the higher capacity electricity network.

Eirgrid published *Ireland's Grid Development Strategy - Your Grid, Your Tomorrow*, which was its second review of Grid 25. This Strategy recognises that the development of the transmission grid is of critical importance to support the economy and society, as well as to realise the transformation of Ireland's energy system to meet climate change and energy obligations.



It reflects EirGrid's focus on facilitating greater public participation in decision-making during project development, an updated economic context, and the testing and/or availability of new technologies, which can and will increasingly be available for use on the transmission grid.

It concludes that Eirgrid will only build new infrastructure when new infrastructure remains as the best solution after considering all options.

Eirgrid's *Implementation Plan 2017-2022* is an overview of how the early stages of Ireland's Grid Development Strategy will be implemented, identifying those parts of the transmission system that are likely to need development over the five year period (2017-2022) and the planning and development of the grid that will be undertaken in implementing the Strategy.



The Implementation Plan has also had regard to the *Transmission Development Plan 2016*, which is a plan for the development of the Irish transmission network and interconnection over a ten year period.

The Council supports the development of a safe, secure and reliable supply of electricity and the development of enhanced electricity networks to serve the existing and future needs of the Region and to strengthen all-island energy infrastructure and interconnection capacity.

In relation to County Louth, works proposed relate primarily to upgrading and refurbishing the existing network.

Where strategic route corridors are identified, the Council will safeguard such corridors from encroachment by inappropriate development and ensure their scope for development is maintained.

### 10.10.3 Gas Supply Network

The natural gas pipeline infrastructure is under the remit of Gas Networks Ireland. A high capacity gas pipeline currently runs along a north-south trajectory from North County Dublin through County Louth into the Northern Ireland gas network. This network provides potential for gas fired generation in the North-East of the country.

County Louth has a substantial gas distribution network and factors such as demand, settlement size and commercial developments, in particular where it is in proximity to the existing network, drives expansion of the service.

Natural gas from a fossil fuel source is a limited resource, which is not renewable. However, the existing gas distribution network in Ireland is effective and supports gas from fossil fuel sources and biogas.

Therefore as Ireland heads towards 2050, it seems likely that there will be more focus on biogas and a consequent reduction of gas from fossil fuel sources in the gas distribution network.

Policy Objective	
<b>IU 79</b>	To support and facilitate the reinforcement and development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the County and Region. This will include the delivery of the necessary integration of transmission network requirements facilitating linkages of renewable energy proposals to the electricity and gas transmission grid, in a sustainable and timely manner, subject to appropriate environmental assessment and the planning process.

Policy Objective	
<b>IU 80</b>	To support statutory and other providers of national grid infrastructure by protecting strategic route corridors from encroachment by development that might compromise the provision of energy networks.

Policy Objective	
<b>IU 81</b>	To ensure that development proposals for energy transmission and distribution infrastructure follow best practice with regard to siting and design. Proposed high voltage overhead lines shall as far as possible seek to avoid areas of sensitivity. Where avoidance is not possible, full consideration shall be given to undergrounding the lines where technically feasible and environmentally appropriate.

Policy Objective	
<b>IU 82</b>	To require the under-grounding of electrical cables within new residential, commercial or civic developments. Where existing, and proposed high voltage lines traverse new residential, commercial or civic developments, these should be re-located under-ground where technically feasible.

**Policy Objective**

<b>IU 83</b>	To require in all new developments, that multiple services are accommodated in shared strips underground and that access covers are shared, whenever possible.
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**Policy Objective**

<b>IU 84</b>	To support Eirgrid’s Implementation Plan (2017-2022) and the Transmission Development Plan (2016) and any subsequent plans prepared during the lifetime of this Plan, subject to appropriate environmental assessment and the planning process.
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**10.11 SUSTAINABLE DESIGN AND ENERGY EFFICIENCY IN BUILDINGS**

According to the EU, buildings account for 40% of total energy consumption in the EU and therefore, promoting sustainable design and increasing energy efficiency in buildings is critically important. *The Energy Performance of Buildings Directive (EPBD) (2010/31/EU) was transposed into Irish law through the European Union (Energy Performance of Buildings) Regulations 2012.*

This Directive (EPBD) requires all new buildings (public and private) are Nearly Zero-Energy Buildings (NZEB) by 2020, which is considered to be a critical requirement for the housing stock in particular.

A ‘Nearly Zero Energy Building’ means a building that has a very high energy performance and the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

The sustainable design, construction and operation of new buildings and in major renovations to existing dwellings, has a significant role to play in reducing energy demand and increasing energy efficiency into the future.

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. The energy efficiency and renewable energy requirements for the construction of new residential and non-residential buildings, along with major renovations to existing dwellings are primarily addressed in the current Building Regulations Part L (1997-2019). A ‘major renovation’ refers to the renovation of a building where more than 25% of the surface of the building envelope undergoes renovation. Part L requires that a building be designed and constructed so as to ensure that the energy performance is such as to limit the amount of energy required in the operation of the building and the amount of carbon dioxide (CO<sub>2</sub>) emissions associated with this energy use insofar as is reasonably practicable.

The Building Regulations requirements for new dwellings also prescribe that a reasonable proportion of the energy consumption to meet the energy performance of a dwelling is provided by renewable energy sources, limiting heat loss, availing of heat gain through the fabric of the dwelling and energy efficiency space and water heating systems.

Energy efficient buildings will generate savings and is a cost effective way of mitigating climate change and improving energy security. The primary focus is to design buildings that create a thermally efficient building envelope.

The use of on-site micro renewable or district heating systems also offers significant opportunities.

The BER label (Building Energy Rating), allows for dwellings to be assessed on their energy performance. This in turn allows individuals to make informed decisions regarding energy efficiency of a building. Exemptions for Protected Structures (proposed protected structures) and buildings protected under National Monuments Legislation apply.

The Council promotes energy efficient design and recommends consideration of energy design at the earliest stage in the design process. However, careful consideration should also be given to the adaptability of buildings over time to enable the building stock to be retrofitted to meet higher efficiency standards into the future. The upgrading and refurbishment of homes and business premises can make a significant contribution in reducing energy demands and costs. The energy performance of existing buildings is one of the foremost considerations in responding to the energy challenges in the County.

Details in relation to Guidelines for Sustainable Design and Energy Efficiency in Buildings, is provided for in Section 10.11.1 of this chapter.

Policy Objective	
<b>IU 85</b>	To support the implementation of National and County initiatives for limiting emissions of greenhouse gases by incorporating energy efficiency measures into the design of new buildings and retrofitting of existing buildings.

Policy Objective	
<b>IU 86</b>	To ensure that all new buildings in the County achieve the Nearly Zero-Energy Buildings (NZEB) standard in line with the Energy Performance of Buildings Directive (EPBD) and having regard to the Guidelines for Sustainable Design and Energy Efficiency in Buildings.

Policy Objective	
<b>IU 87</b>	To promote the use of district heating systems in large scale development and master planned areas and encourage the integration of micro renewable energy sources into the design and construction of single and multiple housing developments.

**Policy Objective**

<b>IU 88</b>	To promote innovative new building design and retrofitting of existing buildings where possible, and encourage the design and construction of buildings that are functionally adaptable, to improve building energy efficiency, energy conservation and the use of renewable energy sources, in accordance with national policy and guidance.
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**Policy Objective**

<b>IU 89</b>	To encourage and facilitate the reuse of existing vacant buildings particularly in town centres.
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**Policy Objective**

<b>IU 90</b>	To support the recycling of building materials on development sites subject to compliance with environmental and building control legislation.
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**Policy Objective**

<b>IU 91</b>	To support and promote structural materials in the construction industry that have low to zero embodied energy and CO <sub>2</sub> emissions as assessed across the whole life of the building.
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**Policy Objective**

<b>IU 92</b>	To encourage and support the utilisation of siting and landscape design features to minimise energy requirements.
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### **10.11.1 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 Part L of the Building Regulations (1997-2019).

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.

#### **10.11.2 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 are 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 CO<sub>2</sub> 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 the 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.

### 10.11.3 Passive Housing

A Passive House is an energy efficient building with year round comfort and good indoor environmental conditions without the use of active space heating or cooling systems. The concept is based on minimising heat losses and maximising heat gains (i.e. orientation), thus enabling the use of simple building services.

The construction of Passive Houses should have regard to the 'Guidelines for the Design and Construction of Passive House Dwellings in Ireland (SEAI)'.

### 10.11.4 Nearly Zero Energy Performance Buildings

All new buildings should be designed to comply with Nearly Zero Energy Performance in accordance with the *Building Regulations 1997 - 2019*. These regulations cover a range of conservation of fuel and energy measures together with the requirement that for new dwellings, a reasonable proportion of the energy consumption of the dwelling is provided by renewable energy sources.

It will be a prerequisite of all development in the Plan area that there is compliance with the provisions of the amended building regulations.

### 10.11.5 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.

### 10.11.6 Alternative Heating Systems

Energy efficient heating systems such as mixed fuel and wood pellet stoves, boilers and heat pump systems can greatly help to reduce energy consumption. 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.

### **10.11.7 Reduction in Water Consumption**

Fresh water resources are increasingly becoming an issue of environmental and economic importance. According to Uisce Éireann, the average daily consumption for all household purposes is about 150 litres per person. On this basis, the average water consumption per person in Ireland comes to 55,000 litres per person per year.

### **10.11.8 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 Uisce Éireann representing 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 Agrément approval to meet the Building Regulations.

### **10.11.9 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. A series of Planning & Development Regulations exempts from planning permission certain types of renewable energy structures including small scale wind turbines in relation to dwelling houses, agricultural buildings and industrial buildings. 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.

### **10.11.10 Micro-Hydro Generation**

The development of micro-hydro generation facilities does not constitute exempted development and as such will require applicants to apply for planning permission. Considerations will include:

- The visual impact of the development must be considered and therefore matters such as turbine siting, cables, channels will be required to be addressed;
- Any potential impact upon residential amenity will also be a consideration in any determination;
- Is the proposed development located in a designated area e.g. Special Area of Conservation (SAC) and / or Special Protection Area (SPA); and

- Where a proposed development occurs within or near a designated site, there is an obligation on the Planning Authority to inform a number of statutory bodies including the National Parks and Wildlife Service (NPWS), the Department Housing, Local Government and Heritage and Inland Fisheries Ireland (IFI) among others. These bodies may recommend a full Environmental Impact Assessment (EIS) and/or Appropriate Assessment (AA), which may add considerable cost to the total project cost.

#### 10.11.11 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. Any materials used in the construction of new buildings are to be in compliance with the minimum standards as set out in the *Building Regulations (1997-2019)*.

#### 10.11.12 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.

#### 10.11.13 Construction Waste

Construction related waste accounts for a significant proportion 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.

#### 10.11.14 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 occupants to comply with the Louth County Council *Segregation, Storage and Presentation of Household and Commercial Waste Bye-laws, 2019*, whereby people must segregate their waste into dry recyclables, food waste and residual domestic waste. New developments should facilitate a three bin system in each unit.

#### 10.11.15 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 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; and
- Preserve and increase planting of trees to absorb CO<sub>2</sub> to help reduce global climate change.

#### **10.11.16 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.