Comhar SDC and Trinity College Dublin

Community Renewable Energy in Ireland:

Status, barriers and potential options

Policy Paper[1]
November 2011

[1] Comhar SDC policy papers contain preliminary research, analysis and findings. They are circulated to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues of relevance.

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Executive Summary

The aim of this research is to examine the status of community renewable energy in Ireland, to identify the barriers to developing community renewable energy and outline potential options to overcome these barriers. This research involved a combination of desktop research and stakeholder engagement.

Renewable Energy in Ireland

Renewable energy contributes to meeting three important energy goals; energy security, cost competitiveness and environmental sustainability. Ireland has ambitious climate change and renewable energy targets, which are framed in the context of international and European agreements, as well as its own independent targets.

In Ireland, renewables only make up a very small percentage of current energy consumption and primary renewable production is low compared to other European countries. However, this situation is starting to change and renewable sources of energy have grown rapidly this decade, particularly the share of electricity from renewable energy. The share of heat from renewable energy also demonstrates a modest increase.

The main sources of renewable energy in order of contribution to Gross Final Consumption are wind, biomass, hydro and liquid biofuels. Ireland has excellent wind resources and it is the most rapidly growing source of renewable energy in Ireland. Bioenergy also constitutes a large percentage of renewable energy and dominates Ireland's renewable energy contribution to thermal energy requirements.

What is a Community Renewable Energy initiative?

Community based energy generation can play an important part in job creation, local income generation, enhancing support for renewable projects and ensuring community involvement in Ireland's transition to a low carbon society.

There are different interpretations of what community renewable energy is and a fluid definition has been adopted for this research based on two key dimensions. Community renewable energy can be defined firstly by who develops a project and the level of engagement with the wider community and secondly by how the benefits of a project are spatially and socially distributed. Community projects are those in which these dimensions are to some degree local, collective and participatory.

International experience suggests that the community approach is highly successful in attaining acceptance for renewable projects, but eventually becomes constrained by ownership restrictions and is not highly scalable. The benefits for localities from community renewables mean that it is a desirable model for Ireland. However, the developer-led approach and joint community-developer projects also play a role in assisting Ireland meet its renewable energy targets. A balanced solution will be an integrated mix of large, small and micro-scale development from various sources.

Status of Community Renewable Energy in Ireland

A Community Energy Map was developed as part of this research to outline the status of community energy projects in Ireland.

There are several examples of community and locally based wind energy initiatives in Ireland that have been completed or are in development stages. Most of the projects have been established as limited companies, although there are some co-operatives. Most of the projects generate electricity to export to the grid. These initiatives take different forms, including small scale local projects; large and small scale projects administered by local land owners, with some projects allowing investment from the wider community; and communities of interest looking to build a portfolio of projects.

Community bioenergy initiatives can take a number of forms. One type of community bioenergy scheme concentrates on using a bioenergy powered system for meeting a locality's heating needs. Bioenergy has a long supply chain and other projects seek to coordinate the growing, harvesting, processing, transport and/or use of bioenergy. Co-ops that enable growers to negotiate better deals and link up with sellers through working in groups are starting to emerge.

Solar and geothermal make up a very small percentage of renewable energy in Ireland and this is reflected in the low number of community initiatives. There are no community hydro schemes in Ireland. There are several other community energy initiatives that aim to reduce energy demand in the locality, establish renewable energy projects and/or meet wider environmental and social objectives.

Renewable Policy Measures in Ireland

The current policy framework relating to financial measures, infrastructure, planning and information and support for renewable energy has been examined. Community renewable energy is mentioned in a number of Government documents, but specific measures to increase community involvement and reduce barriers in the establishment of community renewable energy resources have not been outlined.

Barriers for Community Renewable Energy

The Renewable Energy Partnership (2004) examined the potential for community ownership of wind farms in Ireland and concluded that unless conditions are extremely favourable communities should refrain from investing in projects as the level of risk and uncertainty was too high. Four main barriers to community renewable energy generation have been recognised as an insufficient policy framework; insufficient support structures; a lack of access to finance and grid and planning delays and issues.

Potential Options for Community Renewable Energy

This piece of research is a first step in identifying potential mechanisms for encouraging community renewable energy. Potential options for overcoming these barriers have been identified through examining what has worked internationally and best practice as outlined in academic articles and reports from different stakeholders. The options focus on streamlining and easing the process that community renewable projects must engage in, providing support and advice for communities and acknowledging the difficulties that community projects face in terms of grid connection, planning and financing. Addressing these issues would make engagement more attractive for communities, reduce failure rates and assist in attaining financing as uncertainty would be reduced.

Issue	Barrier	Potential Options to Address Barriers
Policy Framework	There are no explicit policy supports to actively encourage community renewable energy.	• Set targets for community renewable energy and publish measures to achieve these.
	Procedures and time frames are not aligned and developers have to report to a number of different bodies and departments at different stages.	• Introduce a simplified process which aligns different stages and ensures co-ordination between the various departments and organisations involved. • Streamline administrative procedures. • Support initiatives that link stakeholders at different stages of the bioenergy supply chain. • Introduce mechanisms that engage community actors and prevent reliance on the drive of a single individual.
Support Structures	Many communities do not have the capacity, skills and expertise to allow them to develop a renewable energy project.	• Establish a support structure for communities wishing to invest in renewable energy. • The support structure should address market challenges, ensure long-term support and assist disadvantaged communities. • Provide information on natural resources.
Access to Finance	Securing equity finance can be very difficult and community groups are perceived as inherently high risk.	• Financing options include investment subsidies, low interest loans, loans from green banks or funds and tax instruments, such as investment tax credits, tax exemptions, carbon taxes and accelerated depreciation.
	The role of local and community projects is not formally recognised in REFIT.	• Consider a system of tariffs to incentivise small scale and community low carbon electricity generation.
Grid Connection and Planning Permission	The grid is a key reason for delays in projects.	• Allow community projects to connect to the grid more easily. • Consider connection to the national grid for communities at no cost to the project.
	Planning is another major reason for delay. There must be consistency and objectivity with regards to planning decisions.	• Introduce planning rules specifically tailored for small scale projects that aim to speed up and lower the cost of obtaining planning approval. • Maintain clarity for community renewables in the planning process.

1 Background to the Study

1.1 Aims and Objectives

The aim of this research is to examine the status of community renewable energy in Ireland in the context of contributing to job creation, the reduction of greenhouse gas emissions and renewable energy development. This research identifies the barriers to developing community renewable energy and potential options to overcome these barriers.

The objectives are as follows:

1. To outline the context for renewable energy deployment in Ireland.
2. To define and identify the benefits of community renewable energy in Ireland.
3. To establish the status for current community energy projects in Ireland.
4. To identify the policy framework for energy generation in Ireland.
5. To examine the barriers to community energy generation in Ireland.
6. To investigate potential options to overcome these barriers.

1.2 Methodology

This research involved a combination of desktop research and stakeholder engagement. Desktop research was conducted using a range of sources, including good practice case studies from other countries, academic journal articles and reports from different stakeholders. Engagement with the Comhar Council and key stakeholders through unstructured phone calls, email and meetings, where appropriate, was also conducted.

2 Renewable Energy in Ireland

2.1 Renewable Energy Goals

Ireland must meet ambitious international and EU targets in relation to greenhouse gas emissions and sustainable energy (for electricity, heat and transport). Renewable energy contributes to meeting three important goals which are outlined in the European Energy Strategy (European Commission, 2010) and in the Lisbon Treaty[2]; energy security, cost competitiveness and environmental sustainability.

89% of Ireland's energy in 2008 came from imports (SEAI, 2009; Eurostat, 2010). In 2008, Ireland had the sixth highest rate of imports of fossil fuel in the EU at 3.24 tonnes (oil equivalent) per inhabitant. The average for the EU 27 in 2008 was 2.04 tonnes. However, Ireland's imports have fallen since 2002, when 3.52 tonnes were imported per inhabitant (Eurostat, 2010). Creating indigenous renewable energy sources will contribute to energy security.

Investing in renewables is cost effective and adds to our economic competitiveness on three levels. Firstly, Ireland will be better able to cope with any future oil and gas price increases or shocks (SEAI, 2010). Secondly, there is the potential for Ireland to become a net exporter of renewable energy and technology (SEAI, 2010). Thirdly, a strong renewables strategy in heat and transport can assist Ireland in avoiding incurring Excess Emissions Penalties due to not meeting national Greenhouse Gas Emissions targets from non ETS sources (Directive 2003/87/EC) (European Parliament, 2008).

Renewable energy contributes to environmental sustainability. In 2007, energy related emissions accounted for 66% of total greenhouse gas emissions (SEAI, 2009). With lower or no net emissions from renewable energy sources compared to fossil fuels, renewable energy sources contribute to the decarbonisation of energy supply and a reduction in greenhouse gas emissions (SEAI, 2010).

2.2 Strategies and Targets for Climate Change and Energy

2.2.1 International and EU Strategies and Targets

Ireland has ambitious greenhouse gas emission reduction and renewable energy targets (for electricity, heat and transport), which are framed in the context of international and European agreements. As part of the EU target under the Kyoto Protocol, Ireland agreed to limit the growth in its greenhouse gas emissions to 13% above 1990 levels during the first commitment period of 2008-2012. Ireland is legally bound to meet the greenhouse gas emissions reduction target. Ireland's National Climate Change Strategy 2007-2012 (DEHLG, 2007) sets out the measures to meeting these commitments by the end of the period and how these measures position Ireland post-2012.

The European Commission published Energy 2020 in 2010 which defines the energy priorities and sets the actions to be taken in order to tackle the challenges of saving energy, achieving a market with competitive prices, securing supplies, boosting technological leadership and effectively negotiating with international partners.

[2] Lisbon Treaty Article 194 of the Treaty on the functioning of the European Union (TFUE).

The EU reached agreement on its Climate Change and Energy Package in 2008 (European Commission, 2008) with the outcome resulting in three legally binding targets each to be achieved by 2020, known as the '20 20 20' targets. The targets are a

- 20% reduction in greenhouse gas emissions based on 1990 levels (30% if other major emitting countries of the world agree to undertake similar commitments)
- 20% improvement in energy efficiency
- 20% target of renewable energy in final energy consumption

National targets are based on burden sharing and Ireland's target is 16% of gross final energy consumption to come from renewable sources by 2020 (up from 3.1% in 2005). A 10% target for energy from renewable sources in transport has also been set.

Each EU member state is required to submit a National Renewable Energy Action Plan as part of the Renewable Energy Directive (Directive 2009/28/EC), which sets out the steps envisaged to meet the mandatory targets; Ireland's Plan was published in 2010 (DCENR, 2010).

In addition, a revised National Energy Efficiency Action Plan will be published in 2011. An EU Energy Efficiency Plan proposing a range of energy efficiency actions and a legislative proposal for a Directive on energy efficiency which transforms many of the key actions into binding measures was put forward in 2011.

2.2.2 National Strategies and Targets

Ireland has also set its own ambitious targets independent of international and EU commitments. The Energy White Paper (DCENR, 2007) sets individual targets for renewable energy in electricity generation including a commitment to increase the renewable energy contribution to gross electricity consumption to 15% by 2010 and 33% by 2020. In May 2010, the Department for Communications, Energy and Natural Resources announced that Ireland had achieved its 2010 target of generating 15% electricity from renewable sources (DCENR, 2010). This strategy also includes a renewable heat market penetration target of 12% by 2020 and a biofuels penetration target of 10% by 2020. The Irish government lowered the interim 2010 biofuels target for Ireland from 5.75% to 3% in 2008 due to concerns regarding the impact of global biofuels development on food prices, food security and sensitive ecosystems coupled with low emissions benefits from some energy intensive biofuel production processes (SEAI, 2010). The Energy White Paper will be reviewed and a new energy policy framework for 2012-2030 will be published in 2012 (Rabbitte, 2011).

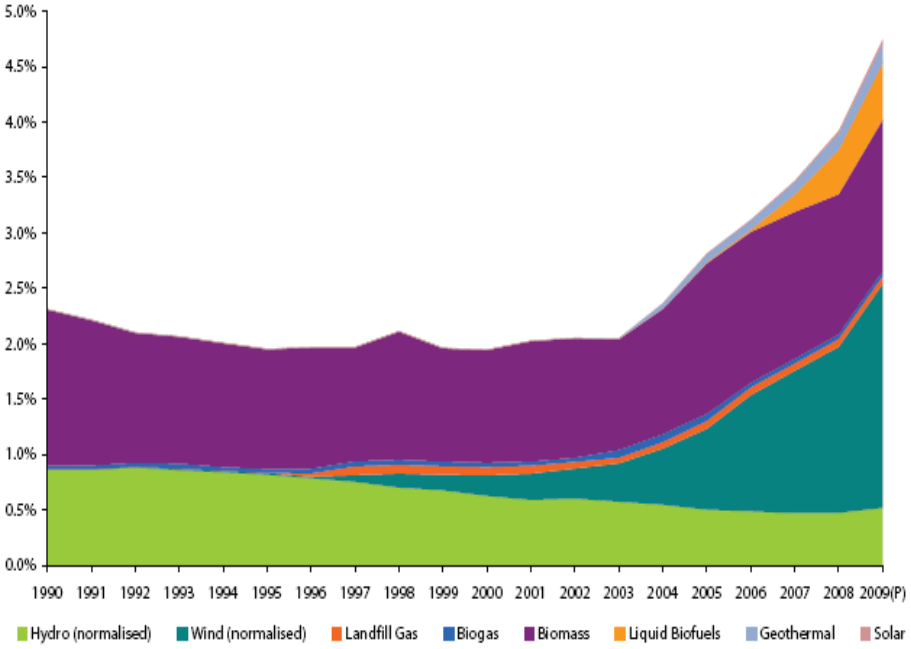
2.2.3 Local Strategies and Targets

Some local authorities have developed climate and energy strategies and/or have developed strategies for renewable energy through their County Development Plans.

2.3 Renewable Energy in Ireland

In Ireland, oil is used more than any other fuel (54.8%). Renewables only make up a very small percentage of current energy consumption and primary renewable production is low compared to other European countries (Eurostat, 2009). Other fuels include peat, coal, natural gas and electricity imports. However, renewable sources of energy have grown rapidly, especially since 2004. The contribution in 1990 to gross final consumption was 2.3% rising to 3.9% in 2008 and estimated in 2009 at 4.7% (SEAI, 2010).

Figure 1: Renewable Energy (%) Contribution to Gross Final Consumption



Source: SEAI

The end use for energy can be categorised into energy for electricity, heat or transport. The share of electricity from renewable energy has more than doubled between 1990 and 2008 from 4.9% to 11.9% (SEAI, 2010). The share of heat from renewable energy has risen from 2.6% to 3.6%, which is a more modest increase, but shows movement in the right direction. Energy for transport has seen the smallest growth (SEAI, 2010).

The main sources of renewable energy in order of contribution to Gross Final Consumption are wind, biomass, hydro and liquid biofuels. There is also a small contribution from geothermal, landfill gas, biogas and solar (SEAI, 2010). Other sources include ocean energy and energy from waste (incineration).

2.3.1 Wind Energy

Ireland has one of the best wind resources in Europe (The Wind Energy Division, 1999). As seen from the Sustainable Energy Authority of Ireland (SEAI) Wind Atlas, at 100 m hub height every county has commercially exploitable wind resources (SEAI, 2003a).

However, Ireland has lower installed capacity than many Western European countries (EWEA, 2008). The situation is starting to change and wind energy is the fastest growing source of renewable energy in Ireland. The contribution of wind energy to Ireland's electricity supply has grown rapidly since 2006 and in June 2011, 1459W of wind capacity had been installed (Eirgrid, 2011).

There are also emerging opportunities in terms of off-shore wind energy. Within the first 8 years of the Gate 3 Incremental Transfer Capability (ITC) programme (2010 - 2017) 601.5 Megawatt (MW) of offshore wind is due to be connected to the grid (SEAI, 2010).

2.3.2 Bioenergy

Bioenergy also constitutes a large percentage of renewable energy, but it is not used for generating electricity to the same degree; it dominates Ireland's renewable energy contribution to thermal energy requirements (SEAI, 2010). Fitz Gerald (2011) cites that earlier studies of bioenergy for electricity production suggested that it was a feasible but expensive option. However, if used for heat purposes close to where it is produced, the cost of bioenergy might be closer to market prices.

There are three main types of bioenergy; biomass, biogas and biofuels. Solid biomass covers organic, non-fossil material of biological origin. It is primarily charcoal, wood, wood wastes and other solid wastes (for example, straw, nut shells, meat and bone meal). Combustion is the preferred technology for these solid wastes. Biogas is a gas produced by the anaerobic digestion of biomass. Biofuels are derived from biomass crops or by-products that are suitable for use in vehicle engines or heating systems. Biofuels must come from sustainable sources (Directive 2009/28/EC). A benefit of bioenergy is that it can utilise waste products and a by-product of the process is a nutrient rich soil amendment which can be recycled back to the land.

Bioenergy has a long and complex supply chain, including the growing of crops, processing and final use. Ideally, bioenergy should be produced and consumed locally to keep transport distances and carbon emissions to a minimum. This also results in economic benefits for local communities but requires further work on establishing local supply chains (IrBEA, 2010).

Most of the solid biomass is used for thermal energy in the industrial sector (78% in 2008) with small portions in both the residential and commercial sectors. 3.8% of biomass was used in Combined Heat and Power (CHP) plants in 2008 (SEAI, 2010). Primary production of energy from biomass (and wastes) is low in Ireland compared to other European countries (Eurostat, 2009).

2.4 Summary

Renewable energy contributes to meeting three important energy goals; energy security, cost competitiveness and environmental sustainability. Ireland has ambitious climate change and renewable energy targets, which are framed in the context of international and European agreements, as well as its own independent targets.

In Ireland, renewables only make up a very small percentage of current energy consumption and primary renewable production is low compared to other European countries. However, this situation is starting to change and renewable sources of energy have grown rapidly this decade, particularly the share of electricity from renewable energy. The share of heat from renewable energy also demonstrates a modest increase.

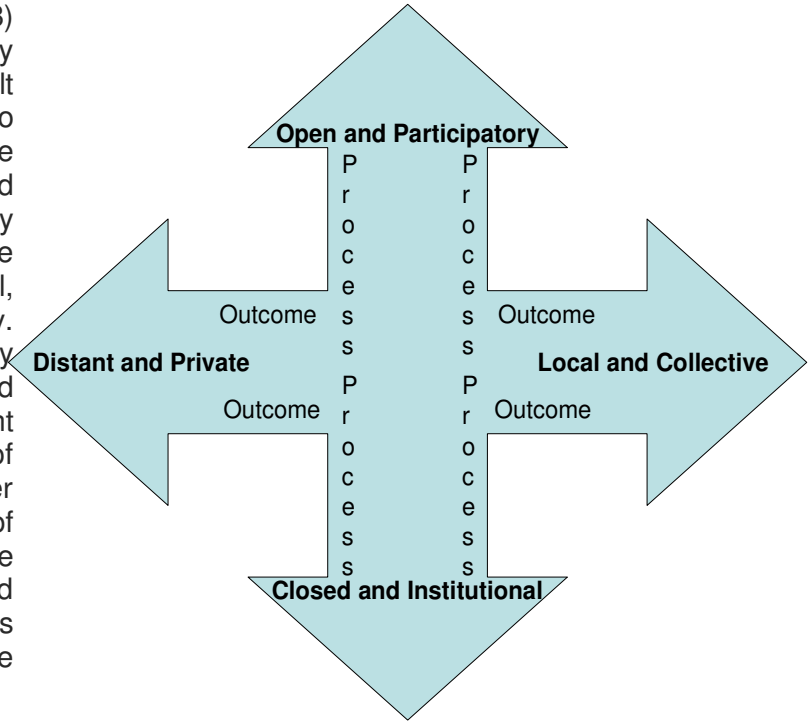
The main sources of renewable energy in order of contribution to Gross Final Consumption are wind, biomass, hydro and liquid biofuels. Ireland has excellent wind resources and it is the most rapidly growing source of renewable energy in Ireland. Bioenergy also constitutes a large percentage of renewable energy and dominates Ireland's renewable energy contribution to thermal energy requirements.

3 What is a Community Renewable Energy initiative?

3.1 Defining Community Renewable Energy

There are different interpretations of what community renewable energy is and a fluid definition has been adopted for this research based on two key dimensions. Community renewable energy can be defined firstly by who a project is developed by and the level of engagement with the wider community (process) and secondly by how the benefits of a project are spatially and socially distributed (outcome). Different ownership possibilities can be mapped based on these dimensions, which are summarised in Figure 2 (Walker and Devine-Wright, 2008).

Figure 2: Understanding of community renewable energy
Source: Walker and Devine-Wright (2008)



Walker and Devine-Wright (2008) place utility wind farms owned by private developers that do not consult with the community and offer no economic or other benefits to the community in the bottom left hand corner of Figure 2. Community projects are those in which these dimensions are to some degree local, collective and participatory. Community renewable energy projects occupy the top right hand corner, but can reside in different spaces depending on the level of engagement with the wider community and the distribution of benefits. A distinction is often made between communities of locality and communities of interest (such as dispersed investors in a cooperative project) (Walker, 2008).

There is some conflict concerning where to locate a group of local landowners that establish a wind farm on their land in the diagram. In a case study in the UK, Walker and Devine-Wright (2008) found clear disagreement between those leading a small wind farm project and a group of protestors as to whether a particular scheme should be called a community wind farm as most of the benefits flow to three local farmers rather than to the community as a whole. Conversely, Hain *et al*. (2005) recognised that small scale and community for-profit can have positive benefits for local regeneration.

While micro-generation allows individuals to participate in the transition to cleaner energy, it is a separate form of non-collective ownership and has not been included in the definition of a community initiative.

3.1.1 Models of Ownership

The involvement of communities in energy initiatives can take various forms from project initiation, administration, development, decision making and financial support. Projects can be fully community owned and develop out of grassroots actions, or may be developed between communities, NGOs and local government or may be developed under co-ownership arrangements with the private sector. In terms of co-ownership the community can initiate the process and then bring a developer on board, or a developer can lead the process and issue shares to either individuals in a community or a community group (WDC, 2007a). Another less participative model includes compensation or a community trust fund from a developer which provides annual funding to local projects over the lifetime of the development (Hain *et al*., 2005). Many large developers of wind farms in Ireland create a community fund for the area.

Projects can involve the ownership and financing of energy production that is fed into the grid rather than being used locally, or can combine the locally owned production and consumption of energy, for example, where heat is produced for direct local use in a community building or a networked group of buildings.

The initiative may be organised through different organisations structures, for example, a co-operative, a limited company with shares owned by a local community organisation or by people in the area, a community charity or a development trust (Walker, 2008).

3.2 The Benefits of Community Renewable Energy

A national study by the Sustainable Energy Authority of Ireland (SEAI, 2003b) demonstrated interest among some people in the local community in investing in the development of renewables. As both the electricity grid and renewable sources are public goods, the benefits from harnessing them should be spread as widely as possible. Some of the key benefits of community renewable energy projects include;

3.2.1 Investment, Income and Jobs

Community-owned means of production can generate income locally, through returns on investment, the sale of generated energy and the creation of employment.

3.2.1.1 Investment Opportunities in Local Areas

Community schemes can offer investment opportunities for rural farming communities to invest in wind energy. In America, farmers may receive $2,000-$10,000 per year for each turbine they have on their land. Each turbine typically removes less than an acre from production, and in most cases livestock can continue to graze up to the base of the turbine tower. On some farms, annual income from hosting wind turbines can meet or exceed annual income from all other farming activities. However, the lease payments made to farmers by commercial wind project developers are not as high as the amount of income the farmer could earn if he instead owned the turbine himself, or with other members of his local community. Conversely, project ownership entails significantly more risk than leasing land to a developer, with up-front capital investment as well as resource investments to oversee (though not necessarily undertake) the construction, operations, and maintenance of the project (Bolinger, 2004).

3.2.1.2 Increase and Diversify Income Sources

The District of Güssing, in Austria (population: 27,200), has traditionally been reliant on agriculture. It did not provide enough jobs locally and the area had a high rate of unemployment. To counteract these disadvantages the people of Güssing developed a renewable energy industry that is supplied from locally available sustainable resources. It is the first community in the European Union to cut carbon emissions by more than 90 percent by producing heat, power and fuels from the sun, sawdust, corn and cooking oil. Within the City of Güssing (population: 3,800), this has resulted in 50 new companies employing more than 1,000 people in new jobs. The total volume of sales generated as a result of this is €13 million per annum. Güssing generates 22 Megawatt (MW) hours of power annually, 14MWs of which are used locally. The surplus 8MWs are sold to the national grid. This generates about €4.7 million in revenue and €500,000 in profit that is used to develop alternative energy projects. It supplies cheaper electricity and heat to local factories, workplaces, public facilities and private homes. Further benefit is gained from growing tourist revenue as eco-tourists, politicians and scientists from all over the world visit the area to view its initiative in environmental sustainability. The scope for creating jobs on the demand for cheaper, cleaner and home-produced energy is extensive. It can create jobs in growing and harvesting; collecting and storing raw materials; designing and building the power plants; teaching and training in environmental technologies; operating the power stations and providing ancillary services (Joint Committee on Trade, Enterprise and Employment, 2008).

In many rural regions, employment is in a process of diversification. Renewable energy fits into the economic and energy requirements of rural communities and could be a strategy for long-term revenue creation, the diversification of income sources and social regeneration of impoverished communities (Hain *et al*. 2005).

3.2.1.3 Wood Energy in Ireland

A study on the economic impact of a wood energy market for the Western Region of Ireland found potentially significant economic and environmental benefits. The medium scenario estimated over 600 Full Time Equivalent jobs and Gross Value Added of €14.5 million by 2020 (WDC, 2007b).

3.2.1.4 Improved Technology and Economies of Scale

In Denmark, community based biomass was recognised as beneficial as farmers could benefit from improved technology and economies of scale. In addition, it relieved farmers from having to operate a plant on their own (Raven and Gregersen, 2007). For bioenergy, a community or partnership approach is critical for successful project uptake as it creates the clustering necessary to achieve a viable project scale.

3.2.2 Lower Energy Costs for Community Buildings

Groups responsible for community buildings typically use renewables because they can provide heating more cheaply and reliably than the alternatives, particularly if grants can be obtained for up front capital costs (Walker, 2008). Green streets, run by British Gas, offered 14 projects across the UK a share of £2m and technical support to run initiatives that save and/or generate energy. Findings from IPPR's evaluation of Green Streets suggest that community building occupiers and community groups benefited financially and were able to focus less on consistently fundraising to pay energy bills and more on funding other projects of community benefit (Platt, 2011).

3.2.3 Public Acceptance

This is particularly pertinent to wind energy. Attitudes of the Irish public to the development of wind farms in Ireland are almost entirely positive. In addition, those with direct experience of a wind farm in the locality are generally impressed with it. However, in some cases there can be considerable public opposition to the construction of wind farms in certain locations. Additional fears have developed about dangers to land and property as a result of the bog burst at Derrybrien in Galway in 2003 (SEAI, 2003b).

Warren and McFayden (2010) compared attitudes to a community owned windfarm and towards several developer owned windfarms in Scotland. Attitudes to the community owned windfarm were consistently more positive than those to developer owned wind farms. The differences were of degree rather than diametrically opposing views. This also supports the findings of Devine-Wright (2005) who found that high levels of support can exist for on-shore wind development that is embedded within the local community. Barry and Chapman (2009) recommend that community wind could provide a valuable strategy for building community support of wind power; especially in communities that are new to wind power.

Findings from Green Streets suggests that community energy initiatives can reach deep into communities and have pronounced impacts on attitudes towards installing energy efficiency measures and community based micro-generation (Platt, 2011).

3.2.4 Attitudes to Renewable Energy and Climate Change

The combined pressures of climate change, peak oil and threats to energy security are driving a policy agenda towards creating a more sustainable energy system (Heilscher *et al*., 2011). Community renewable energy facilitates wider engagement in sustainable energy and climate change debates. The current centralised infrastructure fosters a spatial and psychological distance between energy generation, supply and consumption. More direct and substantial involvement of local people in a project could have a positive impact on peoples' understanding of and support for renewable energy more generally (Walker and Devine-Wright, 2008).

Community led approaches aid the process of people changing their everyday practices together in a supportive environment, empowering others to do the same and increasing the visibility of the impacts of behaviours (Heilscher *et al*., 2011). As part of the Green Streets Challenge in the UK, the IPPR surveyed approximately 1,300 people in households within a distance of, on average, 1.25 kilometres of community buildings that participated in the projects. Many respondents said that being aware of a Green Streets project had changed their attitudes towards energy efficiency and renewable energy and inspired them to take action or would inspire them to take action in the future. Community energy projects have potentially important impacts on attitudes towards sustainable energy within a community, in particular by normalising different technologies (Platt, 2011).

3.2.5 Investment in Renewables

By utilising community models, investment capital can be raised from a larger investor pool with potential for more stable industry growth. International experience suggests that community ownership is capable of accommodating a high number of investors and can be a significant source of investment capital (Barry and Chapman, 2009).

3.2.6 Local Control

Where projects are managed by the community, people living in the area will be able to influence matters that will affect them, such as the scale of development (Walker, 2008).

3.2.7 Ethical and Environmental Commitment

Many individuals involved in leading renewable energy projects in UK have been driven by ethical and environmental commitments to locally owned, sustainable energy (Walker, 2008). Assessment of the social, economic and environmental effectiveness of energy projects demonstrates that small scale approaches have more merit from a social and environmental perspective. Large scale approaches are more economically viable given current costs structures. In terms of overall social, economic and environmental costs, small scale approaches were more effectual (Burton and Hubacek, 2007).

3.2.8 Load management and Resilience

In the UK, deployment of large-scale renewables is creating various problems for the electricity network. Smaller-scale projects avoid some of these issues. If they closely match the existing load in an area they can defer expensive upgrades and extensions of the network, create islands of security during grid outages, and contribute to voltage stability (Walker, 2008). Denmark has a strong tradition of small locally owned wind energy sources. As result, there is a high degree of geographic dispersion, which not only reduces transmission losses, but also helps to reduce the potential severity of fluctuations in power output to the grid at any given moment (Bolinger, 2001). On the other hand, wider distribution may also entail higher costs, in terms of grid connection, construction of substations where necessary, and the need for reinforcement or upgrades of lines in some regions (Barry and Chapman, 2009).

3.2.9 Community Cohesion

Findings from the Green Streets Challenge demonstrate that the projects brought important benefits for the communities beyond energy and money, including improved community cohesion, local engagement and new partnerships (Platt, 2011). A predominantly participatory approach is often based on a strong sense of social cohesion and trust. These initiatives bring together people from different backgrounds and can counter declining civic engagement (Heilscher *et al*., 2011).

3.2.10 The Limit

International experience suggests that the community approach is highly successful in attaining acceptance for renewable projects, but eventually becomes constrained by ownership restrictions and is not highly scalable (Bolinger, 2001). The benefits for localities from community renewables mean that it is a desirable model for Ireland. However, the developer-led approach and joint community-developer projects also play a role in assisting Ireland meet its renewable energy targets. A balanced solution will be an integrated mix of large, small and micro-scale development from various sources.

3.3 Summary

Community based energy generation can play an important part in job creation, local income generation, enhancing support for renewable projects and ensuring community involvement in Ireland's transition to a low carbon society.

There are different interpretations of what community renewable energy is and a fluid definition has been adopted for this research based on two key dimensions. Community renewable energy can be defined firstly by who develops a project and the level of engagement with the wider community and secondly by how the benefits of a project are spatially and socially distributed. Community projects are those in which these dimensions are to some degree local, collective and participatory.

International experience suggests that the community approach is highly successful in attaining acceptance for renewable projects, but eventually becomes constrained by ownership restrictions and is not highly scalable. The benefits for localities from community renewables mean that it is a desirable model for Ireland. However, the developer-led approach and joint community-developer projects also play a role in assisting Ireland meet its renewable energy targets. A balanced solution will be an integrated mix of large, small and micro-scale development from various sources.

4 Status of Community Renewable Energy in Ireland

4.1 Introduction

A Community Energy Map was developed as part of this research to outline the status of community energy projects in Ireland. It details community energy generation projects, as well as community energy descent plans and energy efficiency initiatives. Additional details about the projects marked on this map are provided in this section.

Other local non-community based renewable projects are also presented in this section to provide a picture of the projects happening in Ireland.

The map is available http://maps.google.com/maps/ms?msid=205686614549395399468.000491dbb6301636dee1a&msa=0

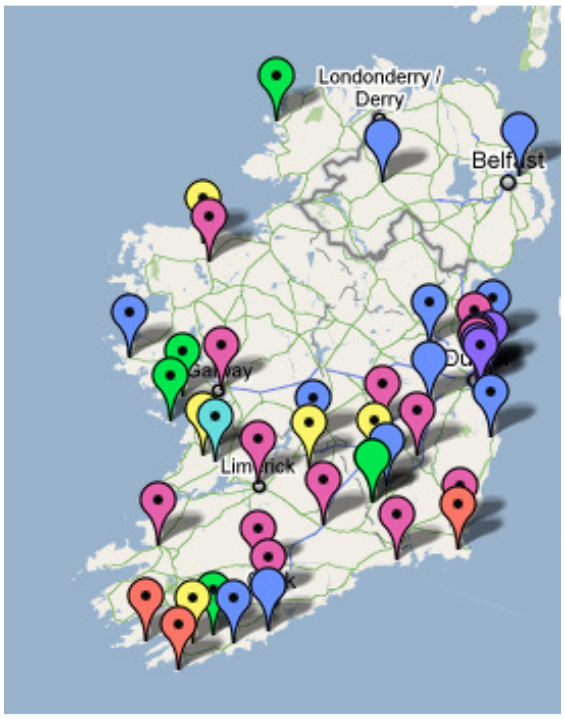


Figure 3: Community Renewable Energy Map

4.2 Wind Energy Initiatives

4.2.1 Completed Community Wind Energy Initiatives

4.2.1.1 Fuinneamh Glas Teoranta (Inis Meain)

Fuinneamh Glas Teoranta (Inis Meain), in the Aran Islands, has been operating since 2002 as a co-operative structure. Energy is generated to power a desalination plant for potable water and surplus electricity is sold into the grid. The three turbines have an installed capacity of 0.68MW of energy. The project received support and funding from a variety of sources including, the EU - Fifth Framework, Údarás na Gaeltachta, Galway County Council and the Island Co-operative on Inis Meain (Renewable Energy Partnership, 2004).

4.2.1.2 Cumhacht Comharchurnann Teoranta (Burtonport)

Cumhacht Comharchurnann Teoranta (Burtonport) in Donegal is operational since 2003 and consists of a 0.66MW turbine. Energy is generated for an auto-production facility for a fish icing process and surplus electricity is also sold to the grid. The project was funded by a grant and a repayable loan on the basis that a certain amount of money would be provided to the community over the first 6 years. Research on the establishment of the project was conducted under an INTERREG project (O'Connor *et al.*, 2004).

4.2.1.3 Comharchumann Chleire Teoranta

Comharchumann Chleire Teoranta in County Cork had the first successful variable pitch turbine in Ireland in 1986. Two 30kW wind turbines were operational for 10 years. The turbines were run by a community co-op and energy was exported to the grid. It was not possible to replace the turbines and they are not currently operational (Irish Islands Federation, website). There are on-going energy efficiency initiatives, solar hot water heating and a Renewable Energy Trail on the island (Cork County Council, 1999).

4.2.2 Community Wind Energy Initiatives in Development

4.2.2.1 Templederry Energy Resources Limited

Templederry Energy Resources Limited in Tipperary has identified renewable energy as a means to achieve social, economic and environmental development for the community. Feasibility studies into three renewables (wind, biomass and anaerobic digestion) were funded by the County Enterprise Board, and carried out by the Tipperary Energy Agency. The results pointed towards wind energy. A wind farm with two 2.3MW turbines is due to be built and connected in 2010-2013 (Eirgrid, 2009[3]). It is registered as a private limited company, with shares held by the Local Development Co-op (2 shares) and individuals (30 shares) residing in the village and surrounding area. The project got planning permission in 2003 and then applied for a grid connection, which they received four years later. There was a further two year delay as they waited for a turbine, which meant it was necessary to re-apply for planning permission. This time the planning was appealed to An Bord Pleanala, which resulted in a delay of over two years. The group got planning in 2009. The project has received support from Tipperary LEADER Group and continual financial, technical and practical support from Tipperary Energy Agency. Each shareholder invested a thousand euros initially and has contributed additional funds since. The group has also sourced Business Expansion Scheme funds and is in the initial stages of arranging bank finance. Following a tendering process with four energy providers, they have signed a 15 year power purchase agreement with Bord Gais. It is expected that investors will get a return on investment 8-10 years after the wind farm is commissioned (National Rural Network, 2011).

4.2.2.2 Barna Wind Energy Ltd.

Barna Wind Energy Ltd. in Cork is due to be connected in 2012-2020, with 22.5MW to be connected in 2015 and 22.5MW in 2017. The 1000 acres is owned by the 6 directors and some land is rented from the adjoining farmers. Phase two will incorporate lands of up to 47 adjoining landowners and will total 2500 acres. Farmers will be paid rent for the use of their land. There is a commitment to the wider community of structured contributions throughout the production life of the project. The fund will be administered by community groups in the parishes (O'Connor *et al.*, 2004).

4.2.2.3 Lisdowney Community Wind Farm

Lisdowney Community Wind Farm in Kilkenny is to be connected in 2012-2020 and is being established by three local land owners. The wind farm will consist of four 2.3MW turbines. The landowners are in the process of raising finance and intend to raise the deposit through a Business Expansion Scheme. The land owners consulted with neighbours and have also contacted three local schools in the area.

[3] All dates for wind turbine connections in section 4.2.2 from (Eirgrid, 2009)

4.2.2.4 Killala Community Windfarm Ltd.

Killala Community Windfarm Ltd. (KCWF) in Mayo is due to be connected in 2012-2020. KCWF is a private limited company formed in 2002 by eight locals with the intention of developing a six-turbine 13.8MW wind farm on their family farms. The group is headed up by three directors and 17 investors. KCWF has partnered with Killala Community Council (KCC), a local community development company. KCC are shareholders in KCWF and are committed to securing the community's involvement in the wind farm. KCWF has received funding from SEAI and the Western Development Commission (WDC) acted as project co-ordinator and facilitator for the feasibility phase of the project. The WDC concluded that a community support structure is needed to provide technical, legal and financial advice on projects if community involvement and investment is to occur on a widespread basis (WDC, 2007a).

4.2.2.5 West Clare Renewable Energy Ltd.

West Clare Renewable Energy Ltd. comprises over 30 farm families who collectively own 3,000 acres of primarily upland properties on Mount Callan and have a majority shareholding in the company (Copley, 2009). They are establishing the proposed 84MW wind farm in partnership with Enercon, who are providing advice and guidance for a percentage of shares. West Clare Renewable Energy Ltd. has offered an investment opportunity to families in the locality, even if the wind farm is not on their land (Deegan, 2010). The proposal has planning permission from Clare County Council and attained approval from An Bord Pleanala, following some local objections, in August 2011. The aim of the project is to create long-term sustainable employment for the area and will provide landowners with an alternative source of income that will sustain their livelihoods. Members of the local community will be afforded first preference regarding construction work and fulltime employment once the wind farm is up and running. An annual fund is also to be provided to the local community (Copley, 2009).

4.2.2.6 Ballycumber Wind Farm

KBM windfarm in Ballycumber, County Wicklow is being developed by five local farmers since 2005. Six turbines with an installed capacity of 18MW on a 3 acre site are due to be connected in 2012-2020. They intend to make an annual donation to local schools once operational. The project has planning permissions and grid capacity in place.

4.2.2.7 Waterford Renewable Energy Co-Operative Society Limited (WRE)

In 2006, Waterford County Council received funding in partnership with four other participants from different countries (Portugal, Wales, the U.K. and Bulgaria) under the Energy Self-Supply in Rural Communities (ENSRC) project which was supported by Intelligent Energy Europe (IEE). The project aimed to establish a pilot rural self supply co-operative in relevant countries and provide technical and administrative support for the first year of operation. In 2007, the Waterford Renewable Energy Co-Operative Society Limited (WRE) was established as the Irish pilot, with assistance from the Irish Co-operative Organisation Society (ICOS). The objective of WRE is to develop a number of renewable energy initiatives for the benefit of its members, with targeted areas such as bioenergy (discussed below) and wind energy. The WRE wind subcommittee has been involved in the establishment of three community owned wind power companies, in examining the potential for wind farm development for nine community groups in County Waterford and in a micro-renewable wind turbine project.

4.2.2.8 Atlantic Coast Energy Co-op

Atlantic Coast Energy (ACE) Co-op Ltd. is a for profit energy enterprise comprised of a consortium of individuals from North West Mayo with an interest in wind energy. According to the founders, the major obstacle to wind farm development is the substantial cost of seeking planning permission and the unpredictability of the outcome, with a risk of rejection. Commercial developers and operators of wind farms manage this risk by running a portfolio of projects on the basis that some will succeed and some will fail. ACE co-op seeks to enable communities to adopt the approach of a mainstream commercial developer, which spreads the risks involved, and makes community ownership of renewable energy generation more available. The idea is that there will be sufficient value in consented sites for successful projects to pay their own planning application costs, to cover the planning application costs of unsuccessful projects and to generate a reasonable income return for ACE co-op members. The goals of the co-op are to generate and sell energy produced from renewable sources located on lands owned by members and third parties; to lobby for changes to the law to enable the development of strategic wind zones and to promote employment in sustainable energy businesses. The co-op is open to all who share this vision. ACE co-op is under direct control of its members who elect the management committee to oversee operations.

4.2.2.9 The Irish Energy Co-op

The Irish Energy Co-operative Society Ltd. (Comharchumann Fuinnimh na hÉireann Teo.) was formed in 2010 to harvest and sell renewable energy. The co-op intends to build two wind farms within the next five years and secure further sites within ten years. They have conducted a number of output studies in preparation.

4.2.3 Community Wind Energy Initiatives Unable to Proceed

4.2.3.1 Bere Island Wind Farm

Bere Island Wind Farm in Cork had planning permission and acquired an AER V Power Purchase Agreement for 0.6MW installed capacity. The turbine was to be fully owned by around 200 residents under a community co-op. All electricity produced was to be exported by undersea cable to the ESB distribution grid at Castletownbere. In 2004, €100,000 had been spent by the community on the process and they were seeking grant aid with which to raise matching loan funds. They had a funding application under INTERREG with a Scottish island community. The revenue generated from the wind energy was to be returned as a community dividend. Planning permission expired in 2004 and this project did not go ahead. Change in the scope of the project and lack of funding were major barriers to progress. In addition, at the time, the process was new and difficult to navigate. The co-op is currently involved in energy efficiency measures and solar energy (O'Connor *et al*., 2004; Renewable Energy Partnership, 2004).

4.2.3.2 Ballycogley Wind Farm

The proposal for Ballycogley Wind Farm in Wexford involved four 3.5MW turbines spread over a 150 acre site. The wind farm was being developed by the Wexford Wind Energy Co-op in partnership with a developer. The developer planned to raise finance for two of the turbines, while the local community were invited to buy shares in the other two larger turbines. Those living closest to the turbines were to be given preference. The project received an EU THERMIE grant. The co-op hoped to raise the remaining funds through a corporate tax relief scheme. The group received planning permission in 2000 (REIO, 2000) High grid connection costs meant this project did not go ahead.

4.2.4 Other Locally-Based Wind Initiatives

Meitheal na Gaoithe (The Irish Windfarmers Co-operative) is Ireland's representative body for independent windfarm developers. It promotes and facilitates the development of small to medium scale wind energy projects by both individuals and communities.

There are a number of farmers erecting wind farms on their land privately. For example, Currabwee, in County Cork was developed by a farmer in partnership with his brother on a dairy farm of seventy cows and is operational since 1999. Normal agricultural activities are carried out beneath the base of the wind turbines. The seven turbines have installed capacity of 4.62MW which is exported to the ESB grid. The total cost of the project was €4.8m, which was financed from a Thermie Grant of €450,000 and a ten-year loan from ICC Bank. The loan is structured so that the revenue from the wind farm will match total repayments over a ten-year period (Renewable Energy Partnership, 2004).

In addition, there are a number of community and social centres, some with residential units, investing in wind energy. For example, the White Oaks rehabilitation centre for drug and alcohol rehabilitation has a 6kW wind turbine. The Dolmen Centre in Donegal, a green energy community owned complex, has a 6kW wind turbine. Gorey Courtown Forest Park Ltd. installed a 75kW Vestas Wind Turbine to provide renewable energy to the centre. It powers eco holiday homes using wood pellet boilers, ground source heat pumps and solar thermal water heating. The Gyreum Ecolodge, situated in Castlebaldwin, Co. Sligo has a wind turbine to power a geothermal heating system and solar panels for hot water. Callagheen Community Wind Farm in Fermanagh is offering grants to community projects located within 7 km of Callagheen Wind Farm.

SEAI are developing technologies for using electric cars on the Aran Islands. Maximum fuel cost saving for the consumer can be achieved in the long-term by using wind and ocean energy to supply transport requirements. Renewable sources can reduce the amount of imported energy to the island and serve as the blue print for a similar system for Ireland. Eight Mega ECity electric cars are currently operating on the islands and the trial will last for 3 years. Each year a new householder will be provided with the opportunity to try the vehicles allowing a maximum of 24 homes to participate.

4.3 Bioenergy Initiatives: Biomass, Biogas and Biofuels

4.3.1 Cloughjordan Eco-Village

In Cloughjordan Eco-Village in Tipperary, all space heating and hot water are provided by a district heating system, owned and run by the not-for-profit Cloughjordan Ecovillage Service Company. Two high-efficiency 500kW boilers fired with wood-chip (waste from a Midlands sawmill) are the main heat source. They are backed up by 500 sq metres of ground mounted solar panels. Both sources supply hot water into well lagged distribution pipes, which provide a metered supply of heat to a heat storage tank in every home. This tank gives the householder complete control over the distribution of heat. The system has received substantial grant funding from the SERVE project (section 4.6.4), and SEAI's House of Tomorrow programme. The plant was first fired up in October 2009 and has already proved itself in a very cold winter.

4.3.2 The Callan Nexus Project

The Callan Nexus project in Kilkenny seeks to coordinate the growing, harvesting, processing, transport and use of biomass into an integrated system. It also aims to create a local renewable energy economy in Callan. The project has support from Callan Renewable Energy Supply Company (CRESCO) along with Kilkenny LEADER Partnership (KLP), Carlow Kilkenny Energy Agency, SEAI, and Teagasc. CRESCO is a not for profit company, a wholly owned subsidiary of Camphill. Through the project, a number of wood pellet district heating systems have been installed in various Camphill Community sites in Kilkenny.

4.3.3 Camphill Ballytobin

Camphill Communities of Ireland is part of an international charitable trust working with people with intellectual disabilities and other kinds of special needs. Camphill Ballytobin houses 85 people on an eight hectare site and includes a primary school, workshops and a community hall. Since 1999, Camphill Ballytobin has used biogas to supply heat to houses and other buildings on the site. The project has received support from the EU Horizon and Altener programmes, the Department of Agriculture and Food and LEADER. The project provides full-time employment for five people and saves up to €25,000 per year in heating. The project displaces at least 380 tonnes of carbon dioxide per year. Camphill Ballytobin collects agricultural waste from local farmers and delivers treated nutrient rich soil amendment back to farmers. Profits are ploughed back into the community to fund buildings and equipment. The most significant barrier faced has been difficulty in obtaining a Power Purchase Agreement that would allow the connection of the community's Combined Heat and Power Plant to the national grid (Healion, 2004).

4.3.4 The Donegal Woodland Owners Society Ltd

The Donegal Woodland Owners Society Ltd (DWOSL) was registered in 2008 and is a wood fuel supply co-operative which supports and promotes sustainable forest management, use of wood as a fuel and timber marketing. By organising into a group, woodland owners in Donegal can increase the saleability of their produce and bring their plantations into active management increasing the quality of their produce. Members have already seen huge cost savings. DWOSL has been financed by membership fees, charges for goods and services and a grant from the Forest Service of the Department of Agriculture, Fisheries and Food. DWOSL has over 140 members who between them own approximately 10,000 acres of woodland.

4.3.5 Greengrove Biofuel Co-Operative Society Limited

Greengrove Biofuel Co-operative has 23 members and is focused on bringing together farmers and forestry owners to develop opportunities for timber and biomass in the region (Roscommon, Galway, Longford, Westmeath and Offaly). There are 29,500 hectares of private forest established in the region but the average plantation is just 8ha. In many cases, the forests are small and hard to access, making it difficult to get contractors interested. Through the co-op, farmers can work in clusters making it worthwhile for contractors and enabling farmers to negotiate better deals. The co-op has organised the first cluster of plantations between a number of farmers for thinning. The co-op is developing a biomass district heating scheme with Roscommon town and a full feasibility study has been completed (Young, 2011).

4.3.6 Kinsale Community Anaerobic Digestion

Transition Town Kinsale (TTK) has been exploring the possibility of developing a community run anaerobic digester (AD) on the outskirts of Kinsale to provide a more cost effective biodegradable waste management system for the area, to generate energy and to provide new opportunities for jobs and income. In 2009, a pre-feasibility study was carried out which found that the AD would be financially, environmentally and socially beneficial. In 2011, the project received a grant under the Rethink, Recycle, Remake (Rx3) programme towards a comprehensive feasibility study which will form the basis of a business plan and planning application. The AD project proposes to:

- Export and sell electricity through the national grid.
- Generate renewable heat and electric energy for local businesses.
- Provide heat from a Combined Heat and Power unit to grain merchants and reclaim low temperature heat from the process for use in a horticultural enterprise.
- Collect biowaste from commercial and domestic producers within a 15-mile radius of Kinsale and co-digest this with agricultural manure to produce high quality fertiliser.

Prospective customers will be local hotels, caterers, farmers, residents and businesses. TTK will be the co-ordinator and will work with local stakeholders to raise the necessary investment. It is envisaged that suppliers will be shareholders in the enterprise. The pre-feasibility study suggests that at least one full and one part-time job will be created, plus additional work for a slurry contractor and a new horticultural enterprise employing two to three people. The AD also has the potential to be an eco-tourism attraction and could save local farmers up to €70,000 per annum in fertiliser costs. The AD would reduce the environmental impact and the cost of waste management and disposal, reduce greenhouse emissions, improve environmental conditions, such as nitrogen in the water and air quality, reduce odours and improve fishing (McMahon, 2011).

4.3.7 Other Locally- Based Bioenergy Initiatives

Local Energy Agencies have been involved in a range of initiatives designed to encourage the development of bioenergy in Ireland. Waterford Energy Bureau has published a guide for Irish farmers in biogas energy production (Gill and Fleming, 2009). Tipperary Energy Agency is involved in projects to develop biomass policy, to develop an interactive online handbook and is a partner within the SERVE project (section 4.6.4).

The Waterford Renewable Energy Co-Operative Society Limited (WRE) biomass subcommittee has been involved in the;

- Establishment and operation of two biomass processing businesses
- Study of the development of miscantus in County Waterford
- Study of the forestry resources of County Waterford
- Marketing study for logs and wood chips in County Waterford
- Feasibility studies into pelleting and briquetting plants
- Wood block pilot market entrance scheme
- Seminars on bioenergy

The Local Energy Agencies in the South East Region (Tipperary, Waterford, Wexford and Carlow/Kilkenny) are involved in the Regional Biomass Business Development (RBBD). RBBD brings partners together from Ireland, Sweden and Estonia who will implement actions to support biomass business development.

The County Clare Wood Energy Project (CCWEP) is a Forest Service funded project whose aim is to promote the installation of wood biomass boilers fuelled by wood chip from farm forests in Clare. It is managed jointly by Clare Local Development Company and Teagasc. Since the project was launched in 2005, CCWEP has worked with a number of companies and organisations in Clare to identify suitable sites for the installation of medium sized wood biomass boilers and has provided on-going technical support and training for boiler procurement and installation. Significant work on the establishment of a local wood chip supply chain has also been undertaken.

An EU funded initiative to support the development and growth of the local bioenergy industry is currently under way in Westmeath. The project, lead locally by Westmeath Community Development Ltd., aims to support the development of a local bioenergy market, by learning from leading regional bioenergy markets in Europe. It plans to adopt Europe's most relevant strategies and practices in the Midlands over the course of a 3-5 year action plan. The project workers will engage with all stakeholders and interested parties in developing the action plan.

RASLRES is a European bioenergy project funded under the Northern Periphery Programme (NPP). It is led by the Western Development Commission (WDC) and includes project partners from Sweden, Scotland and Northern Ireland. The main aim of RASLRES is to increase the use and uptake of locally produced renewable energy through the development and implementation of targeted market stimulation models. RASLRES employs a full supply chain approach and encourages partnership between public and private players resulting in benefits for both fuel suppliers and fuel users. The WDC is developing six pilot projects to test and demonstrate different methods to achieve these aims. The project will also support the development of tools to measure rural greenhouse gas emissions and assist in the setting up of a network for exchange of knowledge, policy initiatives, technology and methodologies.

International Resources and Recycling Institute (IRRI) is an environmental charity and is a lead partner in SMALLEST, a service to make renewable energy more accessible to small communities in the most remote areas of Northern Europe. Renewable energy project options for a community are profiled and the partners work to design and deliver a solution with the community. IRRI has funded an Energy Development Officer to work with Clár ICH and a Community Development Officer to work with Mayo County Council's Renewable Energy Mayo agency. Clár ICH is a housing association based in Claremorris in Mayo and was formed in 2000 to develop social housing projects.

4.3.7.1 Private Bioenergy Enterprises

There are private farmers growing biomass for sale and commercial ventures arising from bioenergy. Here are just a few examples. Wexgen Limited is owned by farmers and produces GreenFlame Biomass Briquettes which are made from biomass energy crops. Kilogen Ltd is based in Kilkenny and is a Green Energy Service Company (GESCO) that produces and processes bioenergy fuels and delivers integrated heat and power technologies. Bio Green Energy Products Limited based in Wexford is growing rape-seed oil for biofuels for vehicles. Green Biofuels Ireland (GBI) Ltd., also based in Wexford, is Ireland's largest commercial-scale biodiesel processing plant and was established by a group of farmers and business people. GBI biodiesel is made from waste products such as oils and fats as well as oilseed crops. EcoOla supplies biodiesel to captive fleets in Ireland and has been awarded Preferred Supplier status for the supply of biodiesel to government departments and local authorities nationwide.

4.3.7.2 Community Buildings

Bioenergy is used in some community buildings, for example, Old Leighlin Community Hall in County Carlow has a wood chip boiler system. The management committee has secured an agreement with an adjacent land owner for space to build a wood chip store which has been operational since early 2007. This allows the system to use locally produced wood chips.

4.4 Solar, Geothermal and Hydro Initiatives

Solar and geothermal make up a very small percentage of renewable energy in Ireland. Kilmaley housing development in Clare provides district heating and hot water for a community housing development for older people (O'Connor *et al*., 2004). Cloughjordan Eco-Village has solar panels as part of its community heating system. There are solar energy initiatives in several Camphill Communities in the Kilkenny region. Bere Island Projects Group has educated local residents about solar hot water heating and has been successful in encouraging take up. Carrick on Shannon Heritage Group have installed geothermal heat pumps for hot water and heating.

There are no community hydro schemes in Ireland, although there are some small scale hydro projects and community hydro has been successful internationally. Carlow-Kilkenny Energy Agency recently completed a study on hydro potential and identified potential community schemes (Wickham, 2010). Limerick Clare Energy Agency also carried out a study on micro-hydro potential (Limerick Clare Energy Agency, 2010).

4.5 Community Energy Efficiency and Energy Descent Planning

4.5.1 Transition Towns

Transition Town is a voluntary community initiative working to help make the transition from a dependency on fossil fuel to a low carbon future. The main aim of the project is to raise awareness of sustainable living and build local ecological resilience. Communities are encouraged to seek out methods for reducing energy usage as well as reducing their reliance on long supply chains that are totally dependent on fossil fuels. Many transition towns are actively developing energy descent plans and some are looking into developing local renewable resources.

4.5.2 Energy Smart Communities

The Energy Smart Community is a not-for-profit Energy Service Company run by Codema, Dublin's Sustainable Energy Agency providing sustainable energy advice to the four local authorities in Dublin. The Energy Smart Community helps people in local communities to improve the energy performance of their homes by availing of energy saving grants from the Government. By coming together in local Energy Smart Communities, people can maximise their combined buying power through bulk purchasing and competitive tendering. The community group must take ownership. There are currently six Energy Smart communities; Sutton, Ballinteer, Phibsboro, Drumcondra, Rathfarnham and Skerries.

4.5.3 Community Initiatives

Sustainable Clonakilty is a voluntary group working towards Clonakilty becoming energy independent by 2020, and a leader in Ireland for renewable energy generation. They published a comprehensive roadmap towards energy neutrality in Clonakilty by 2020. The study provides an overall sustainable energy strategy which also encompasses energy demand reduction and renewable energy systems. The study found that implementing the roadmap would generate significant savings and would create local jobs. The project is supported by the West Cork Development Partnership under the Rural Development Programme 2007-2013.

Ballynagran in Wicklow aims to be the first zero carbon community in Ireland. It is initially focusing on energy efficiency but expects to invest in renewables in the future. Funding has been secured from Wicklow County Council in association with Greenstar Landfill levy.

Trim 2025 aims to be energy neutral by 2025. It is looking to develop a district heating system using biomass grown locally and the first stage is a demonstration project with the OPW, Trim Leisure Centre and the local GAA club house, with the view to extending the system to the wider community.

Sustainable Skerries is a local voluntary group aiming to create resilience in terms of climate change and peak oil. They are part of the transition movement, are an energy smart community and aim to produce renewable energy locally in the future.

4.6 Other Locally- Based Energy Initiatives

4.6.1 Sustainable Energy Authority of Ireland

A Sustainable Energy Community (SEC) is a community in which everyone works together to develop a sustainable-energy system and aims as far as possible to be energy-efficient, to use renewable energy and to develop decentralised energy supplies. SEAI established Dundalk 2020 as the first Sustainable Energy Community in Ireland in partnership with Louth County Council. Activities began in a 4 sq km sustainable energy zone where approximately 2,500 people live, 3,500 work and 5,850 study. Dundalk now provides a showcase for the innovative technologies, policies and practices that are needed to create sustainable energy communities nationwide. In Dundalk, the energy efficiency measures undertaken has resulted in savings of approximately €500,000 per annum, spread across all sectors. It is estimated that through implantation of projects in Dundalk approximately 5,000 tonnes of carbon dioxide is avoided per annum. Tralee, Dublin City and Tallaght were selected as the three new exemplar sustainable energy communities that will commit to specific energy saving projects for the next five years. SEAI will select an additional two communities through a competitive process. The initiative must be led by a Local Authority. Together, the six communities will demonstrate best practice in technology, techniques, policy and behaviour through implementing a series of local cross sectoral projects.

Sustainable Clonakilty is also working with the GAA in a pilot project called Sustainability 10k. Supported by SEAI, it will stimulate jobs in the sectors of energy, water and waste through collectively upgrading the energy performance of local homes. Participants in the pilot project will receive access to bulk purchase savings and government grants.

4.6.2 Mayo Energy Audit 2009-2020

The Mayo Energy Audit 2009-2020 is an investigation into the implications of peak oil and subsequent fossil fuel depletion for a rural county in the west of Ireland. The study examines current energy supply and demand within Mayo and assesses these demands in the face of the challenges posed by the declining production of fossil fuels, expected disruptions to supply chains and by long term economic recession.

The study evaluates each individual resource on a case by case basis and makes an assessment of what might be achievable by 2020 and beyond. It focuses primarily on the technologies already available, and examines how these sectors might be developed further. It represents the first regional study of its type to be carried out in Ireland, and is aimed at providing a platform for a comprehensive strategic energy plan for Mayo.

A follow up study, the Mayo Audit Update - currently underway - will reassess energy supply and demand in the context of the emerging global financial crisis. It will also assess the Mayo land resource from a perspective of food security. The Mayo Audit Update will be published in the autumn of 2012 (Wilson and Lynch, 2008).

4.6.3 The Green Home programme

The Green Home programme is administered by An Taisce Environmental Education Unit. The Energy Theme offers support and advice to households on no cost and low cost ways to save money on their household bills. Green Home data findings indicate an approximate saving of €160 per household per year on an average yearly electricity bill of €1,120. Several thousand households are currently working on the Green Home programme through the Green-Schools network. Allied to this are several businesses and community network associations, including some TidyTowns groups.

4.6.4 Local Authorities

Many local authorities are involved in both energy projects (some with support from SEAI). The following sets out a small sample of some of the projects:

- Waterford City Council has built over 150 low energy affordable and social houses throughout the city. Technological improvements include solar water heating, gas fire condensing boilers, circuit heating and digital control features, room thermostatic control, CFL lighting features and higher levels of insulation.
- Kilkenny County Council's social and affordable housing development of 21 dwellings in Mooncoin incorporates a high level of building fabric upgrade, solar panels and wood pellet central heating stoves (OLAM, 2008).
- Galway County Council is leading a project in Tuam which focuses on creating a sustainable energy plan involving energy efficiency and local renewable generation (Galway County Council, 2008).
- Wexford County Council's Community and Enterprise Section have promoted energy efficiency in Community Buildings through their Sustainable Community Buildings Grants Scheme. The scheme has part funded energy audits, insulation measures, wood pellet boilers, heating controls, water conservation measures and energy efficiency lighting upgrades (OLAM, 2008).
- Tralee Town council are working on a biomass district heating scheme. To date 1MW of biomass boilers have been installed and are supplying heat and hot water to dwellings.

4.6.5 Sustainable Energy for the Rural Village Environment

The SERVE (Sustainable Energy for the Rural Village Environment) project in North Tipperary targeted a total of 632 buildings, existing and new, for energy efficiency and renewable energy measures over a 3 year period. It reduced the energy consumption in 500 existing buildings by improving their energy performance through insulation and heating control measures. It supported the installation of renewable energy heating systems and demonstrated the use of electricity from micro-wind. The eco-village in Cloughjordan is related to this project. It consists of 132 houses which showcase energy efficient design and are supplied by Ireland's first renewable energy district heating system.

4.6.6 The Drumshanbo Forum

The Drumshanbo Forum has initiated a three-part programme to develop the Lough Allen Basin Smart Energy Hub (known as Labs), focusing on training, long-term job creation and lasting environmental benefits. The Forum aims to attract sustainable employment and held a symposium in April 2011.

4.6.7 Sustainable Farming

In Dunhill, Co Waterford, a farming family have been working on making their farm sustainable, with support from Waterford LEADER Partnership, Waterford Renewable Energy Co-operative Society Limited, Waterford Energy Bureau and the Sustainable Energy Authority of Ireland. The developments have reduced the cost of farm inputs and made the business more profitable. The farm has a dairy operation of 50 cows as well as a poultry section consisting of 7000 breeder hens. Maize, kale and oats are also grown on the farm. Electricity is generated on the farm using a 10kW wind turbine, which generates 75% of the farms electricity requirements of 40,000kW. When the turbine is producing more electricity than is needed it is sold back into the grid. The turbine supplies the farming activities and also two houses on the farm. Heating is provided by a 48kW wood chip boiler, which supplies the milking parlour with hot water and heating and hot water for the two houses. The wood chips are at present produced from bought-in timber but from 2012 wood chips will be produced from willow grown on the farm. The waste from the poultry operation is used to fertilise the crops, which reduces the energy used to manufacture fertiliser and transport it to the farm. These crops are in turn used as feed for the animals on the farm. Runoff water from the farmyard is treated by a constructed wetland which treats over 500,000 litres of wastewater per year (WRE, website).

4.7 Summary

A Community Energy Map was developed as part of this research to outline the status of community energy projects in Ireland.

There are several examples of community and locally based wind energy initiatives in Ireland that have been completed or are in development stages. Most of the projects have been established as limited companies, although there are some co-operatives. Most of the projects generate electricity to export to the grid. These initiatives take different forms, including small scale local projects; large and small scale projects administered by local land owners, with some projects allowing investment from the wider community; and communities of interest looking to build a portfolio of projects.

Community bioenergy initiatives can take a number of forms. One type of community bioenergy scheme concentrates on using a bioenergy powered system for meeting a locality's heating needs. Bioenergy has a long supply chain and other projects seek to coordinate the growing, harvesting, processing, transport and/or use of bioenergy. Co-ops that enable growers to negotiate better deals and link up with sellers through working in groups are starting to emerge.

Solar and geothermal make up a very small percentage of renewable energy in Ireland and this is reflected in the low number of community initiatives. There are no community hydro schemes in Ireland. There are several other community energy initiatives that aim to reduce energy demand in the locality, establish renewable energy projects and/or meet wider environmental and social objectives.

5 Renewable Policy Measures in Ireland

5.1 Community Renewable Energy Generation in Irish Policy

The Programme for Government 2011-2016, includes a commitment to facilitate the development of energy co-operatives to make it easier for small scale renewable energy providers to contribute to the renewables target (Department of Taoiseach, 2011). One of the recommendations of the Report of the High-Level Group on Green Enterprise (2009) is to develop greater public understanding of the economic, environmental and social advantages of local renewable energy projects and encourage communities to join together to develop and promote renewable energy projects. The White Paper on Energy (DCENR, 2007) recognised that greater community involvement in renewable energy initiatives was a widely endorsed development. However, specific measures to increase community involvement and reduce barriers in the establishment of community renewable energy resources have not been outlined.

5.2 Current Financial and Fiscal Schemes for Renewables

5.2.1 Feed in Tariff

In 2006, the Renewable Energy Feed in Tariff (REFIT) scheme replaced the previous competitive tendering process. REFIT provides power purchase agreements to renewable energy projects over a fifteen year period. Applicants in REFIT must have planning permission and a grid connection offer for their projects in order to contract with a licensed electricity supplier. REFIT 1, the original REFIT scheme covered small and large scale onshore wind, biomass, landfill gas and hydro. Under the terms of the state aid clearance, no new applications have been accepted since 31/12/2009. REFIT 2 is (as of November 2011) with the European Commission for state aid clearance. This scheme is intended to cover small and large scale onshore wind, biomass, landfill gas and hydro. REFIT 3 is also with the European Commission for state aid clearance. This is a scheme to cover certain bioenergy related categories, such as anaerobic digestion, Combined Heat and Power and biomass combustion (including provision for 30% co-firing of biomass in the three peat powered stations). Separate state aid applications will be required for additional REFIT categories of offshore wind, wave and tidal energy. Solar PV is not included for cost reasons.

5.2.2 Tax Relief

Section 62 of the Finance Act 1998 provides a scheme of tax relief for corporate equity investments in certain renewable energy projects (solar, wind, hydro or biomass). The relief is given in the form of a deduction from a company's profits for its direct investment in new ordinary shares in a qualifying renewable energy company. The scheme has been extended to 31 December 2011.

5.2.3 Business Expansion Scheme

The BES (Business Expansion Scheme) is a tax relief incentive scheme for investment in certain corporate trades. There is no tax advantage for the company in receipt of the BES, but securing this funding may enhance their ability to attract other external funding (Department of Finance, 2006).

5.2.4 Accelerated Capital Allowance Scheme

The Accelerated Capital Allowance Scheme (Section 46 of the Finance Act 2008) enables businesses to write off the entire cost of a specified set of energy efficient technologies, including renewable energy technologies in the first year of purchase.

5.2.5 Rural Development Programme Fund

Under the Rural Development Programme Fund 2007-2013 (previously known as LEADER), a percentage of grant aid for certain small scale projects (e.g. run by micro-enterprises or community groups) using renewable technologies may be available in some instances (2006/144/EC).

5.2.6 Grant Schemes

SEAI operate a number of grant schemes that provide funding for insulation and/or the installation of renewable technologies in homes, such as the Better Energy Homes scheme and the Warmer Homes scheme. The Combined Heat and Power Deployment grant scheme and the Renewable Heat Deployment Programme (ReHeat) have been closed due to non availability of budget resource for 2011.

5.2.7 Bioenergy Establishment Scheme

The Department of Agriculture, Fisheries and Food provides establishment grants to farmers to plant willow and miscanthus to produce biomass suitable for use as a renewable source of heat and energy. The scheme provides grants of up to €1,300 per hectare or 50% of the cost. The scheme was initially launched on a pilot basis in 2007.

5.2.8 Wood Biomass Harvesting Machinery Scheme

The Department of Agriculture, Fisheries and Food has introduced a scheme of support grants to assist the development of the supply chain required to process and supply wood biomass to end users.

5.2.9 Carbon Tax

A carbon tax at a rate of €15 per tonne of carbon dioxide was introduced on fossil fuels in the 2010 budget. The tax applies to petrol and auto-diesel, kerosene, marked gas oil, liquid petroleum gas, fuel oil and natural gas. Electricity is not subject to the carbon tax. One of the consequences of the carbon tax on fossil fuels is to improve the cost competitiveness of renewables (Department of Finance, 2009).

5.3 Current Infrastructure Policy for Renewables

5.3.1 Connection to the Grid

EirGrid and ESB networks issue connection offers to generators. Gate 3 refers to the third round of connection offers that are being issued to generators under the Group Processing Approach. Priority grid access is provided for renewable generators and exemptions are available for public good projects. The offer sets out the connection charge and estimate timeline specific to the individual customer for an operational date. EirGrid runs an Incremental Transfer Capacity (ITC) Programme to identify the scheduled firm transmission capacity to be provided to each of the eligible Gate 3 projects for each year from 2010 to 2025.

5.3.2 Cost of Connection

The capital costs of connection and technical adaptation are divided between producers, transmission and distribution system operators. The costs of the immediate connection assets to the network are born by the connecting producer while the costs of additional reinforcement of the surrounding base network are recovered through a tariff imposed on all users of the system.

5.3.3 Small and Low Carbon Generators

Certain renewable, small and low carbon generators can connect to the transmission and distribution grids without going through the full rigours of the Gate process. This includes small projects, research and development projects and those that are deemed to provide benefits of a public nature (CER 09/099). This does not, however, apply to wind. There are separate existing arrangements for wind less than or equal to 0.5 MW.

5.4 Current Planning Policy for Renewables

5.4.1 Planning Decisions and Policy

Planning decisions are made at a local level. A number of local and regional bodies have included renewable energy development in their County Development Plans. At a national level, the Planning and Development (Amendment) Act 2010 deals with strategic development and infrastructure. Wind Energy Development Guidelines have been published (DEHLG, 2006).

5.4.2 Planning Exemptions

Planning exemptions for micro-generation renewable energy technologies for domestic and other buildings apply to wind turbines, solar panels, heat pumps and biomass subject to certain conditions in each case (S.I. No. 83 of 2007). The Planning and Development Regulations 2008 (S.I. No. 235 of 2008) provide exemptions for wind turbines, met masts, Combined Heat and Power plants, solar panels and biomass boiler units for industrial buildings, business premises and agricultural holdings.

5.5 Current Information and Support for Renewables

The Renewable Energy Information Office (under SEAI) provides a public information service where practical information on renewable energy can be obtained. There are also a number of Local Energy Agencies around the country which aim to promote and support the development renewable energy and energy efficiency and implement energy policy. Some of these agencies have been involved in local demonstration projects and provide advice to community groups.

5.6 Summary

The current policy framework relating to financial measures, infrastructure, planning and information and support for renewable energy has been examined. Community renewable energy is mentioned in a number of Government documents, but specific measures to increase community involvement and reduce barriers in the establishment of community renewable energy resources have not been outlined.

6 Barriers to Community Renewable Energy

6.1 Introduction

The Renewable Energy Partnership (2004) examined the potential for community ownership of wind farms in Ireland and concluded that unless conditions are extremely favourable communities should refrain from investing in projects as the level of risk and uncertainty was too high. It is still difficult for communities to establish renewable energy projects. Community renewable initiatives offer benefits for localities and play a role in assisting Ireland meet its renewable energy targets. The opportunity for communities to engage in renewable energy and take advantage of the revenue that can accrue from this form of asset ownership should not be missed. This section aims to identify the barriers that communities face when establishing a renewable energy project.

6.1.1 Scope

Detail on general issues affecting all renewable projects will not be explored in this section unless they are seen to be particularly pertinent to the progress of community renewable projects. There are varied renewable energy project options relevant to communities. Barriers are examined in the context of wind, bioenergy and the enabling technologies, Combined Heat and Power (CHP) and district heating, as they are currently the most prevalent for community investment in Ireland, as identified in section 4. However, this section will not go into detail on each individual source. Further research could assess barriers for communities specific to different renewable energy sources.

6.2 Policy Framework

6.2.1 Lack of Policy Supports and Drivers

While community renewable energy has been recognised as a desirable development in Irish policy, most recently in the Programme for Government, there are no explicit policy supports to actively encourage community renewable energy in relation to any of the current sources and technologies.

6.2.2 Complex Process

Alignment of Procedures and Bodies: Developing community renewables is a complex, multistage undertaking. Procedures and time frames are not aligned. There are three basic requirements for most renewable projects; planning, grid connection and a Feed in Tariff. Ensuring that all three are attained without delays is difficult in the current system. The length of the project process can place a considerable strain on community resources and engagement (WDC, 2007a). In addition, developers have to report to a number of different bodies at different stages. There is no one body that co-ordinates or oversees this.

Administrative Burden: The administrative burden of developing and operating renewable energy should not be excessive. Community energy initiatives spend 90% of their time ensuring the survival of the organisation and only 10% on developing the project (Heilscher *et al.*, 2011).

Burden on Drivers of Community Projects: Community projects are often driven by a dedicated individual with support from others. Those involved often work on a voluntary basis. However, the length of time necessary to initiate a project, the complexity of the process and other difficulties can mean that the main driver(s) in the community may be unable to sustain the level of work required over a prolonged period of time.

6.3 Support Structures

6.3.1 Insufficient Support Structures

Many communities do not have the capacity or organisational experience to empower themselves to take full advantage of renewable energy opportunities that arise. In addition, a community may not have the necessary specialist skills to develop a project, particularly in terms of the planning, technical, financial and practical aspects (Renewable Energy Partnership, 2004). Without specialist support it is likely that expensive mistakes will be made (Platt, 2011). Many of the community projects in section 4 sought assistance from development organisations, Local Energy Agencies and private developers.

6.3.1.1 Other Support Challenges

Marketplace Challenges: Communities are often unaware that they can become involved in renewable energy and the idea of establishing a community renewable initiative is not normalised in Ireland. Once people are aware of the opportunities they can have difficulty acquiring information about options (O'Connor *et al*., 2004). Advice on the most appropriate solution will not always emerge directly from the market. A company specialising in one technology will often promote it, irrespective of other options that may exist. Communities need to be educated about, and assisted in negotiating, these marketplace challenges (Platt, 2011). There can also be a lack of market confidence, as these technologies are relatively new, especially in terms of community investment.

Need for Long-term Capacity: Developing community renewable energy is a long-term, fragile process and requires a long-term commitment. It takes time for the sufficient social structures and technical knowledge to emerge. If programmes are interrupted then key individuals may start working in other areas and experience is lost (Raven and Gregersen, 2007). In addition, small groups are not often capable of keeping systems operating efficiently for a long process.

Inequalities: Some communities will be able to draw on existing professional skills of community group members. These resources are not evenly spread and some communities will have better and deeper capabilities than others (Platt, 2011).

Information on Natural Resources: Investment of community resources will only take place when the community and funding agencies have confidence in the energy source. A community cannot have confidence to invest in a renewable energy without reliable and accurate information on the natural resource. A barrier to the development of renewable energy is the long-term, insufficient investment in scientists and equipment to obtain and process the basic information on these resources and make it available for decision makers and communities. This is particularly evident in relation to geothermal resources and groundwater resources, which are more difficult and costly to map and measure as they are hidden from view below the surface.

6.4 Access to finance

6.4.1 High Capital Costs

The capital requirements for renewable projects are considerable and the payback period is long-term. Access to upfront capital is essential for communities to meet both relatively small costs, such as those associated with obtaining grid connection or becoming properly constituted, and more significant sums (Platt, 2011). Securing equity finance can be very difficult and community groups are perceived as inherently high risk. Communities are competing with development companies with resources and knowledge for access to finance. Confidence in community projects is hampered by the uncertainty that is faced at all stages of project development. One of the projects in section 4 was unable to progress due to lack of funding and nearly every project received some form of financial assistance, which begs the question- what happens to communities who cannot access these funding sources?

Schemes, such as the Rural Development Programme Fund, have been good at assisting with feasibility studies; however, there is a significant investment required to move from a feasibility study to an investable project, and funding for this phase is difficult to attain.

6.5 Grid Connection and Planning Permission

The three barriers outlined so far are common to all sources and technologies. Grid connection delays are a key issue for wind, some stages of bioenergy and CHP. Planning delays affect all sources and technologies, except at some stages of the bioenergy supply chain. Planning can be a particularly difficult stage for wind energy and district heating projects.

6.5.1 Grid Connection Delays

IWEA (2010) identified grid connection as the key reason for delays in Gate 2[4] projects.

6.5.2 Planning Delays

IWEA (2010) identified planning as the second biggest reason for delay.

Planning Objections: Objections and the time taken to address these appeals were identified as an issue for some of the projects in section 4.

Planning Outcome Variability: A study in the UK found the planning process to be highly variable in terms of outcomes with some local authorities supporting installations and others blocking renewables deployment (Platt, 2011). Feedback from stakeholders suggests similar issues in Ireland.

6.6 Summary

Four main barriers to community renewable energy generation have been recognised as an insufficient policy framework; insufficient support structures; a lack of access to finance and grid and planning delays and issues.

[4] Gate 2 was the second round of connection offers issued to generators under the Group Processing Approach (GPA).

7 Potential Options for Community Renewable Energy

7.1 Introduction

This section aims to identify potential options to address the barriers documented in section 6. This piece of research is a first step in identifying potential mechanisms for encouraging community renewable energy. It is beyond the scope of this paper to examine the cost and impact of each of these options. Further research could examine the feasibility of these options in Ireland, so that concrete recommendations for Government could be made. The suggestions presented below should be considered as the output of an exercise to identify and explore a selection of mechanisms that have worked internationally and best practice as outlined in academic journal articles and reports from different stakeholders.

7.2 Policy Framework

7.2.1 Lack of Policy Supports and Drivers

A mechanism for overcoming this barrier is to set concrete targets and measures for community renewable energy so that there is a commitment to increase community ownership and a comprehensive path of actions to deliver on these commitments.

Good Practice Example: Scotland is leading the way on community renewables in the UK and has supported community energy ownership through tailored schemes since 2003, resulting in over 800 projects. The Scottish Government (2011) wants to see the benefits from renewables accrue to individuals and communities, and not just private investors. It recently set a new target of 500 MW community and locally-owned renewable energy by 2020 and has set out how it will achieve this in its Routemap for Renewable Energy.

Good Practice Example: The regional government in Upper Austria has set targets for the development of biomass heating and has provided comprehensive information, energy advice, awareness-raising activities and financial incentives. In 2010, there were more than 40,000 wood chip and pellet heating installations, along with 300 district heating networks and 12 biomass power stations. The growth of the industry is attributed to the “carrot-stick-tambourine” approach (tambourine is a metaphor for the awareness-raising activities underwritten by the state) (Bagley and Parker, 2010).

7.2.2 Complex Process

Alignment of Procedures and Bodies: One way of addressing this barrier is to adopt a simplified process which aligns different stages, particularly planning, grid connection and a Feed in Tariff. Such a process would have the added advantage of allowing developers to estimate time frames and costs. There is also a need to ensure co-ordination between the various departments and organisations involved. The complexity of the process is a key barrier for bioenergy, as it has a long supply chain with different requirements at each stage. Reliable, quality supply chains are needed and this is starting to emerge, for example, through co-ops that link biomass crop growers or wood suppliers with buyers. Additional support for such initiatives could be valuable in enhancing opportunities for community bioenergy projects.

Administrative Burden: Administrative procedures should be efficient and streamlined as far as possible.

Burden on Drivers of Community Projects: Mechanisms that engage community actors and prevent reliance on the drive of a single individual could bring more community projects to a successful conclusion. This could be through training or through providing a pool of experienced facilitators or through a funding mechanism to provide project workers.

7.3 Support Structures

Many community projects are run by a small number of individuals on a voluntary basis. Many of these individuals do not have any previous experience in renewable energy. Support in initiating, co-ordinating and directing a project is essential to guide communities interested in sustainable energy but lacking the skills and experience, confidence or time to develop the project independently (Rogers *et al*. 2008). The Western Development Commission (2007), based on their experience of facilitating a community wind farm, concluded that a support structure is required if community involvement and investment is to occur on a widespread basis in Ireland.

Conclusions from the Green Streets project contend that impartial government backed advice is the preferred option. Ensuring communities make the right decisions is critical to the cost-effectiveness and credibility of their work, as poor or no advice is likely to lead to substandard choices and costly implementation. Support should be either face-to-face or over the telephone and not only through electronic media. Some areas where assistance is needed include advice on models of governance, how to manage the process, business planning, how to work with local people, how to manage resources and technical advice. There also needs to be opportunities for peer-to-peer learning (Platt, 2011).

Establishing a support structure requires funding, but has the potential to create jobs and provide an income to local communities. It has proven to be a successful way of increasing community renewable energy generation. The support could be provided through an existing agency with expertise in renewables or community development organisations, but they would also require training and funding. A proportion of this function could be paid for by the groups themselves in arrears once the financial savings and Feed in Tariff payments begin to flow (Platt, 2011). Some examples of support structures are outlined below.

7.3.1.1 Models for Community Support Structures

There are a number of successful community renewable projects happening in Ireland, as outlined in section 4. Such initiatives could be expanded and/or used as models for further community engagement in renewables.

Good Practice Examples: The Scottish Community and Householder Renewables Initiative (SCHRI) was established in 2002 to provide grants, advice and project support to assist the development of new community and household renewable energy schemes in Scotland. An evaluation of the scheme found that 92 projects would not have proceeded without the funding, while the remaining 54 would have either been delayed, or been of a smaller scale or lower quality. It also found that community projects exhibit high levels of additionality; over one quarter of projects in the household stream would have taken place in any case, compared to none of the community projects (The Scottish Government, 2006). The community stream of SCHRI has been replaced by the Community and Renewable Energy Loan Scheme (CARES), which has assisted 105 projects over the last 2 years with an installed capacity of 53 MW.

Community Energy Scotland is an independent Scottish charity that provides free advice and support for community renewable energy projects. This extends to non-profit distributing organisations such as social enterprises and housing associations.

The Highlands and Islands Enterprise in Scotland set up a Community Energy Company that provides revolving fund security for community enterprises. In its first project, it took a shareholding in a small wind farm on Gigha which will be bought out by a Trust after five years of operation. It is a valuable model for remote communities with high diversification and regeneration needs (Walker, 2008).

The Community Renewables Initiative ran in the UK from 2002 to 2007 and was managed and co-ordinated by the Countryside Agency. It had a brokering role, identifying opportunities for the installation of renewable energy, providing information and expertise, networking organisations together and supporting project teams through the different phases of project development. It was organised through local support teams for 10 areas of England (Walker *et al*., 2007).

Energy4All was formed in 2002 due to daily enquiries received by Baywind Co-operative, the UK's first community-owned wind farm, from people looking to replicate their success. It aims to expand the number of renewable energy co-ops in the UK. Energy4All offers advice on the industry, business and community involvement, as well as administrative and financial services to co-ops in return for an annual fee.

Another way to encourage development of small scale projects is through demonstration projects which allow communities to experience renewable energy first-hand, as well as provide a platform to test feasibility, explore research interests and disseminate novel technologies. Demonstration project help determine whether projects can make a useful contribution when devising policy (Hain *et al*., 2005). SEAI and the local energy agencies have been successfully involved in demonstration projects in Ireland.

7.3.1.2 Other Support Challenges

Marketplace Challenges: This barrier could be addressed through a support structure for delivering advice to assist communities.

Need for Long-term Capacity: It is important that long-term support is provided by the support structure.

Inequalities: It is important to prevent an environment where communities are either renewable rich or poor. There is a need to find ways of mitigating and reducing these inequalities through ensuring that capacity, skills and funding are equally available. This will require new forms of partnership, facilitation, mutual aid and peer-to-peer learning.

Information on Natural Resources: A mechanism for overcoming this barrier is to increase investment in scientists with specific skills to carry out research and monitoring of our natural renewable resources.

7.4 Access to finance

7.4.1 High Capital Costs

The benefits of community renewables will not be realised unless capital is available, including finance to move a project from a feasibility study to investable project. An option for addressing this barrier is to inform financial institutions and build confidence in the investment prospects for communities in Ireland (O'Connor *et al*., 2004). This barrier also links in with the previous issue of support, as additional support structures would instil confidence in community projects and prevent communities from ending up in debt. Continued funding from the Rural Development Programme Fund and other agencies is required. Some financing options are discussed below.

Good Practice Examples:
Investment Subsidies: With an investment subsidy, the Government would pay for the initial costs of setting up a project. This is particularly attractive to smaller developers such as community groups or farmers who may face financing constraints. Investment subsidies are one of the most commonly used support policies (Barry and Chapman, 2009). However, it is recognised that in the current economic climate, investment subsidies may not be feasible.

Low Interest Loans: In 2009, Bank of Ireland launched a €100m fund to support the financing of Irish based renewable energy projects. The bank has assembled a renewable energy portfolio and aims to grow its share of the Irish market. It is currently funding wind farms in Cavan, Cork, Donegal, Kerry, Louth, Mayo and Sligo. Such initiatives could be extremely useful in financing community based renewable energy.

In the UK, a Green Investment Bank will be established and it will be valuable in financing low carbon infrastructure programmes (HM Treasury, 2011). It could provide community groups with access to capital at concessional interest rates (Platt, 2011).

Mortgage banks in Denmark provide long-term, market rate loans for up to 70% of the value of an applicant's real estate. Financing is linked to the financial health of the real estate, as opposed to the project itself. Denmark also has ethical banks that will loan funds for turbines at below market rates (Bolinger, 2001).

The Scottish Government has committed to a long-term funding mechanism through the Community and Renewable Energy Scheme (CARES) which supports pre-planning costs with loans in place of grants. However, many communities still face difficulties in gaining access to finance post-planning. The Scottish Government (2011) plans to engage with investors to establish a Scottish Green Equity Fund to support the development of community projects.

Fiscal Incentives: There are a range of potential tax instruments, including investment tax credits, tax exemptions, carbon taxes and accelerated depreciation. Accelerated depreciation, has been particularly successful in Sweden and Denmark (Barry and Chapman, 2009). Denmark has historically refunded the entire carbon tax on electricity consumption and a portion of the energy tax to independent wind generators. In Denmark, a partnership is not a taxable entity; taxes are levied proportionally on each individual, who is taxed according to their individual tax situation. During the 1990's, families were offered tax exemptions for generating their own electricity within their own or an adjoining community, as long as it did not exceed certain limits (Bolinger, 2001).

The majority of community wind projects in the United States have been financed using some form of a partnership flip structure. At its most basic, this involves the local community partnering with a tax equity investor and establishing a special purpose entity, which then builds and operates the project. Cash benefits include revenue from the sale of power and possible receipt of federal cash grants. Tax benefits include tax losses from accelerated depreciation deductions and tax credits. Once the tax equity investor has achieved an agreed target internal rate of return, both the cash and the tax allocations flip to favour of the local sponsor (Bolinger, 2011).

7.4.2 Renewable Energy Feed in Tariff

A Renewable Energy Feed in Tariff (REFIT) is now part of the policy framework for renewables in Ireland and has opened up opportunities for community groups. The long-term certainty of revenue these instruments create is of great benefit and can be significant to communities (Platt, 2011).

Some reports have recommended additional support for community or small scale projects under REFIT. The Renewable Energy Partnership (2004) recommended that the Feed in Tariff for community investment groups should be calculated so that it is high enough to allow investors to repay a ten year loan from their credit union on an average site. One of the recommendations from the Green Streets project is the introduction of differentiated levels of support, with projects of community benefit receiving higher tariff levels than private enterprises. A number of challenges would exist to such a move, in particular how to determine whether a project is of community benefit (Platt, 2011).

The example below highlights that there are different methods of administering Feed in Tariffs, and other models may be useful in encouraging community renewable energy in Ireland. The cost of other options and the benefits that such options could provide would need to be assessed in order to evaluate their applicability for the Irish context.

The UK FIT works alongside the Renewables Obligation Certificates (ROC), which is the primary mechanism to support deployment of large-scale renewable electricity generation. It differs from the REFIT scheme in Ireland in that it rewards electricity that is generated, as opposed to just energy that is exported. This means that a community can utilise this energy themselves or can export it to the grid and receive a small additional export payment.

7.5 Grid Connection and Planning Permission

7.5.1 Grid Connection Delays and Costs

There are already processes in place to allow small, low carbon generators and projects that are deemed to provide benefits of a public nature to connect to the transmission and distribution grids more easily. Community based projects also provide benefits of a public nature and are particularly vulnerable in the case of delays. Specific processes to enable community renewable projects to connect to the grid more easily could save communities money, decrease uncertainty and reduce the length of the project process.

The Renewable Energy Partnership (2004) recommend providing connection to the national grid at no cost to the project for all renewable energy projects below a certain size and with a high level of community involvement. The eligibility for such connections needs to be established according to clearly defined criteria. The costs and benefits of this option would need to be assessed.

7.5.2 Planning Delays and Related Issues

Planning rules specifically tailored for small scale projects which aim to speed up and lower the cost of obtaining planning approval could be introduced.

Good Practice Example: A number of countries have done so, including Germany, to developers of three or fewer turbines and the UK, to wind farms smaller than 5MW (Barry and Chapman, 2009).

Planning Objections: Community groups can attempt to overcome problems with objections through engagement work, but this requires finance, resources and skills (Platt, 2011). A support structure would be valuable in assisting communities.

Planning Outcome Variability: Local authorities have progressed policies and procedures in relation to renewable energy through including renewable infrastructure in County Development Plans, zoning land for wind energy and developing renewable energy guidelines. As decisions are made at the local level, further work is required in ensuring that there is consistency between counties and that decisions are linked to national and EU policy and legislation. A mechanism for overcoming this barrier is to maintain clarity for community renewables in the planning process. The Green Streets project in UK recommended funding an educational outreach programme on renewables for planning officers and councillors to ensure more consistency in terms of decisions (Platt, 2011).

Good Practice Example: The Scottish Government (2011) will streamline systems and achieve greater speed and transparency, without sacrificing proper consideration for impacts on the local environment.

7.6 Conclusions

The options explored in this section focus on streamlining and easing the process that community renewable projects must engage in, providing support and advice for communities and acknowledging the difficulties that community projects face in terms of grid connection, planning and financing. Addressing these issues would make engagement more attractive for communities, reduce failure rates and assist in attaining financing as uncertainty would be reduced.

7.7 Summary

Issue	Barrier	Potential Options to Address Barriers
Policy Framework	There are no explicit policy supports to actively encourage community renewable energy.	• Set targets for community renewable energy and publish measures to achieve these.
	Procedures and time frames are not aligned and developers have to report to a number of different bodies and departments at different stages.	• Introduce a simplified process which aligns different stages and ensures co-ordination between the various departments and organisations involved. • Streamline administrative procedures. • Support initiatives that link stakeholders at different stages of the bioenergy supply chain. • Introduce mechanisms that engage community actors and prevent reliance on the drive of a single individual.
Support Structures	Many communities do not have the capacity, skills and expertise to allow them to develop a renewable energy project.	• Establish a support structure for communities wishing to invest in renewable energy. • The support structure should address market challenges, ensure long-term support and assist disadvantaged communities. • Provide information on natural resources.
Access to Finance	Securing equity finance can be very difficult and community groups are perceived as inherently high risk.	• Financing options include investment subsidies, low interest loans, loans from green banks or funds and tax instruments, such as investment tax credits, tax exemptions, carbon taxes and accelerated depreciation.
	The role of local and community projects is not formally recognised in REFIT.	• Consider a system of tariffs to incentivise small scale and community low carbon electricity generation.
Grid Connection and Planning Permission	The grid is a key reason for delays in projects.	• Allow community projects to connect to the grid more easily. • Consider connection to the national grid for communities at no cost to the project.
	Planning is another major reason for delay. There must be consistency and objectivity with regards to planning decisions.	• Introduce planning rules specifically tailored for small scale projects that aim to speed up and lower the cost of obtaining planning approval. • Maintain clarity for community renewables in the planning process.

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Appendix 1: Additional Resources

Guides to Community Renewable Energy Generation

- The Renewable Energy Partnership. (2004). *To catch the wind*. Retrieved from http://www.seai.ie/uploadedfiles/FundedProgrammes/File1ToCatchtheWind.pdf
- The Western Development Commission. (2007). *Communities and renewable energy: A guide*. Retrieved from http://www.wdc.ie/publications/reports-and-papers/reports-2007/
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Web Tools

- The RETScreen Clean Energy Project Analysis Software is a free decision support tool that can be used worldwide to evaluate energy production and savings, costs, emission reductions, financial viability and risk for various types of renewable energy and energy efficient technologies. The software also includes product, project, hydrology and climate databases, a detailed user manual, and a case study based college/university-level training course, including an engineering e-textbook http://www.retscreen.net/ang/home.php.
- "Local Investment in Renewable Energies" aims to promote citizen participation in the financing of wind farms in Europe. More information is available by following the link http://www.welfi.info/en/index.htm.

Appendix 2: Community Ownership Structures

The majority of community energy projects in Ireland are established as limited companies. There are also some established under co-operative structures[5]. Some examples of community ownership structures utilised internationally are outlined below.

The success of community wind in Denmark is associated with its familiarity with co-operatives. It makes use solely of general partnerships that for the most part operate according to co-operative principles. Individuals pool their savings to invest in a turbine, and sell the power to the local utility at an attractive rate. In addition, the partnership receives a full refund of the carbon tax and a partial refund of the energy tax. Investors continue to pay their own electricity bills as normal. An individual can also deduct the interest on a loan for their share of a turbine from income taxes (Bolinger, 2001).

Germany's primary model is more commercial in nature; a limited partnership with a developer's limited liability company as general partner. Community investment in a developer-led project can occur either pre or post development. In Germany, where familiarity and comfort with investments in wind projects are relatively high, due both to the stability of an attractive Feed in Tariff as well as readily available low cost debt financing, community investors often fund projects prior to development (Bolinger, 2001).

In the UK, some developers are starting to engage in co-ownership models and if it proves productive in helping to secure planning permission, particularly for wind farms, it could become more widespread as standard industry practice (Walker, 2008).

The UK has also pursued an investment fund structure, which is similar to a mutual fund, but invests in renewable energy and not publicly traded companies. The investment fund amasses an unspecified amount of capital from individuals and then searches for suitable projects in which to invest. An investment fund typically invests either prior to or during development, taking an equity stake in a company specially created to develop the project (Bolinger, 2001).

A study conducted by WDC (2008) established that community enterprises have the potential to act as significant drivers of development in the wood energy sector in the west of Ireland. Community groups and enterprises typically have the required network and expertise to bring potential wood and fuel stakeholders together, for example, private forest owners and heat users. There is not a single model and each community will have to identify and design an enterprise specific to that community. The study presents five enterprise options open to communities.

Limited Liability Partnership offers a hybrid form of community-enterprise financing. Limited Liability Partnership is a corporate body with continuing legal existence independent of its members and has the benefit of limited liability. Limited Liability Partnerships are not taxed in their own right but revenues pass straight through to the members who are then taxed individually. With this instrument, it is possible for other stakeholders beyond the investors to become members (Comhar SDC, 2009).

[5] Ireland employs a legal structure known as an industrial and provident society, which operates like a cooperative.

An Energy Service Company (ESCO) guarantees energy savings and/or the provision of the same level of energy service at a lower cost through the implementation of an energy efficiency (or renewable energy) project and is rewarded based directly on the energy savings achieved. This is also known as Energy Performance Contracting. The market for ESCOs is well established in some EU countries; however the uptake in Ireland has been slow. This is due largely to a lack of awareness of the ESCO concept, a lack of regulatory targets/incentives for energy efficiency, reluctance to risk outsourcing energy services and possibly a lack of attention from international ESCOs who have been focused on larger markets. SEAI (2005) undertook a study aimed at developing potential options that could be used to improve the uptake of energy services via the ESCO model.

Appendix 3: The Danish Example

Denmark is held as a model in community energy generation. The first modern wind turbines installed in Denmark during the 1970s were developed and owned by private individuals without government support. To reward this high degree of private initiative and enthusiasm, and to compensate local communities for the positive externalities that accrue largely on a national rather than local level, the government encouraged local private ownership of wind turbines through a variety of subsidies and ownership restrictions (Bolinger, 2001). During the 1990's, families were offered tax exemptions for generating their own electricity within their own or an adjoining community and by 2001, over 100,000 families belonged to wind turbine co-operatives. Such co-operatives had installed 86% of all the wind turbines throughout the country (Hathway, 2010).

There have been innovative projects established around community renewable energy. The island of Samsoe, Denmark, was in 1998 selected by the Danish Government as a demonstration case for a community to be supplied with 100% renewable energy. They implemented initiatives around solar heating, district heating systems based on biomass, CHP schemes, biomass, wood pellet and wood chip and other biomass production and delivery services, wind turbines and reducing energy consumption in the transport sector. Many of the projects, such as the solar water heating, wind turbines and biomass projects were organised through co-operatives. Financing schemes with strong involvement from the inhabitants on the island were also developed.

Wind development in Denmark up until 2001 was overwhelmingly community based. A Liberal-Conservative coalition government was re-elected in 2001 and altered the landscape for both renewable energy and community renewable energy in Denmark, stopping the development of further wind projects (Hathway, 2010). This demonstrates the importance of political will in pursuing a low carbon renewable energy supply. However, in 2007, the Danish Government published the Government Platform 2007: Society of Opportunities which saw a long-term commitment to becoming fossil fuel independent. They aim to double the share of renewable energy, so that it accounts for at least 30 per cent of energy consumption by 2025. There is move towards larger turbines and the attitude towards wind turbines has suffered a reversal (Maegaard, 2009).

Appendix 4: Community Renewable Energy Initiatives Table

Name	County	Energy Type	Date	Progress	Organisation Structure	Purpose of Energy	Scale	Sources of capital	Additional Information
Fuinneamh Glas Teoranta (Inis Meain)	Aran Islands, Galway	Wind	2002	Operating successfully since 2003.	Co-op Comharchumann Inis Meáin Teo	To power a desalination plant for potable water. Surplus electricity is sold into the grid.	0.68MW Vestas 3x225kW	EU - Fifth Framework, Údarás na Gaeltachta, Galway County Council, Island Co-operative on Inis Meán	
Cumhacht Comharchurnann Teoranta (Burtonport)	Donegal	Wind	2003	Operational since 2003.	Fisherman's co-op	Autoproduction facility providing energy for fish icing process Power to national grid	0.66MW Vestas 1x660kW	66% grant (Udaras and International Fund for Ireland) 33% repayable loan on the basis that €30000 would be provided to the community over the first 6 years.	Research done under an inter-reg project.
Comharchumann Chleire Teoranta (Cape Clear)*	Cork	Wind	1986	The first successful variable pitch turbine in Ireland. It was operational for 10 years. It was not possible to replace the turbines and it is not currently operational.	Run by the National Board for Science and a community co-op	Export all electricity produced to the ESB grid.	0.66 kW 2 X 0.33kW		A number of other projects took place, such as a Renewable Energy Trail. There is also high take up of solar hot water heating on the island.
Currabwee	Cork	Wind	1999	Operational since 1999.	Farmer, in partnership with his brother	Export all electricity produced to the ESB grid.	4.62MW Vestas 7x660kW	Support from EU Thermie grant and ten-year loan from ICC Bank which is structured so that the revenue will match total repayments over the ten-year period.	
Templederry Energy Resources Ltd.*	Tipperary	Wind		Contracted Wind farm due to be built and connected 2010-2013	Registered as a private limited company. 2 shares are held by the Local Development Co-op and 29 shares are held by individuals residing in the village and surrounding area.	Export all electricity produced to the ESB grid.	4.6 MW 2X2.3MW	Support from LEADER and Tipperary Energy Agency. Also investments from people in the community to fund additional work. Still in the process of raising finance.	Feasibility studies into renewables energy were funded by the County Enterprise Board, and carried out by the Tipperary Energy Agency

Name	County	Energy Type	Date	Progress	Organisation Structure	Purpose of Energy	Scale	Sources of capital	Additional Information
Lisdowney Community Wind*	Kilkenny	Wind		Gate 3 Wind farm due to be connected 2012-2020.	3 Local land owners. The project is set up as a limited company.	Export all electricity produced to the ESB grid.	9.2MW 4x2.3MW	In the process of raising finance. Intend to raise the deposit through a Business Expansion Scheme.	Consultation with neighbours and contact with local schools.
Barna Wind Energy Ltd.	Cork	Wind		Gate 3 Wind farm due to be connected 2012-2020 at reduced capacity of 45 MW. 22.5 MW to be connected in 2015 and 22.5 in 2017.	Registered as a private limited company. 1000 acres is owned by the 6 directors and rented from adjoining farmers. Phase two will incorporate lands of up to 47 adjoining landowners, who will be paid rent, and will total 2500 acres.	Export all electricity produced to the ESB grid.	45 MW	Private fund of group members.	There is a commitment to the wider community of structured contributions throughout the production life. The fund will be administered by community groups in the parishes.
Killala Community Windfarm Ltd. (KCWF)	Mayo	Wind		Granted planning permission in November 2010. Due to be connected 2012-2020.	Formed by 8 locals to develop a wind farm on their family farms. The group is headed up by three directors and 17 investors. Killala Community Council are shareholders in KCWF.	Export all electricity produced to the ESB grid.	13.8MW 6X2.3MW	It has received funding from SEAI. It was also backed by the Western Development Commission (WDC).	
West Clare Renewable Energy Ltd.*	Clare	Wind		The proposal has planning permission.	Over 30 farm families who collectively own 3,000 acres on Mount Callan have a majority shareholding in the company. Also a partnership with Enercon providing guidance for a percentage of shares.	Export all electricity produced to the ESB grid.	84MW 28X3MW	It is hoped that funding can be raised on the international markets.	It is hoped other projects can be built on this such as a biomass project and eco-tourism.
Waterford Renewable Energy Co-operative Society Ltd.*	Waterford	Wind and biomass (wood chip, blocks and miscanthus)	2006	WRE are partners in three community wind farm projects. WRE are developing a bio-energy market in Waterford	Elected Board of 8 members, Waterford Energy Bureau, provides technical and administrative support to WRE. Three sub-committees; 1) Wind Projects 2) Bio-energy 3) Finance	Develop renewable energy projects in Waterford. Maximise income from projects to the benefit of members		Members share holding, grant assistance from external sources, third party financing.	WRE was formed by Waterford County Council, through an EU funded ALTERNAR project, which was coordinated by Waterford Energy Bureau.

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Atlantic Coast Energy (ACE) Co-op Ltd.	North West Mayo	Wind		Enables communities to adopt the portfolio approach of a mainstream commercial developer.	ACE co-op is under direct control of its members who elect the management committee to oversee co-operative operations.	Ensure sufficient value for successful projects to pay their own planning costs, to cover the planning costs of unsuccessful projects and to generate income.		ACE co-op members	The portfolio approach spreads the risks involved and makes community ownership more accessible.
Ballycumber Wind Farm*	Wicklow	Wind		It has planning permission and grid capacity. Due to be connected 2012-2020.	Developed and financed by five local farmers	Export all electricity produced to the ESB grid.	18MW		
The Irish Energy Co-operative Society Ltd. (Comharchumann Fuinnimh na hÉireann Teo.)		Wind		Intend to build two wind farms within five years and secure further sites within ten years. Conducted a number of output studies.	Formed in 2010 to harvest and sell renewable energy	Export all electricity produced to the ESB grid.			
Bere Island Wind Farm*	Cork	Wind		Acquired an AER V Power Purchase Agreement. They also reapplied under AER VI. Planning permission expired in 2004. This project did not go ahead	Community co-op- Fully owned by the c. 200 residents. The revenue generated from the wind energy would be returned as a Community Dividend	Export all electricity produced to the ESB grid.	600kW linked by undersea cable to the ESB distribution grid at Castletown bere	In 2004, €100,000 had been spent by the community and they were seeking grant aid with which to raise matching loan funds. They had funding application placed under INTERREG with a Scottish island community.	Change in scope and scale of the project and lack of funding. The process was new and difficult to navigate. The co-op is involved in energy efficiency and solar energy.
Ballycogley Wind Farm	Wexford	Wind		High grid connections meant this project did not go ahead.	Wind Energy Co-op. A developer planned to finance two turbines. The local community were invited to buy shares in two other larger turbines, with those living closest to the turbines given preference.	Export all electricity produced to the ESB grid.	3.5 MW 4 turbines spread over a 150-acre site.	EU THERMIE grant. The co-op hoped to raise the remaining through a corporate tax relief scheme introduced in the 1998 Finance Bill.	

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Callan Nexus Project	Kilkenny	Biomass		Has installed wood pellet district heating systems and solar panels in various Camphill sites.	Not for profit company Callan Renewable Energy Supply Company (CRESCO) along with Kilkenny LEADER Partnership (KLP), Carlow Kilkenny Energy Agency, SEAI, and Teagsac.	To create a local renewable energy economy in Callan. Coordinating the growing, harvesting, processing, transport and use of biomass fuels into an integrated system.			CRESCO was established by local voluntary drivers (now directors) and was the basis of Callan's involvement in the EU ELVA Project. It is a wholly owned subsidiary of Camphill.
Camphill Biomass (AD)*	Kilkenny	Farm-based biogas plants	1999	Operational since 1999	It is a subsidiary of Camphill Communities of Ireland. BEOFS (Bio-energy and Organic Fertiliser Services) established to research, design, build and operate the AD Plant. Profits are ploughed back into the community to fund buildings and equipment.	The biogas is used in boilers to heat the digesters and to supply heat to houses, a school, three workshops and a large hall. Camphill Ballytobbin collect agricultural waste and deliver treated nutrient rich soil amendment back to farmers.	One vertical concrete digester and one horizontal steel digester (used as storage). Total used capacity 450 m^3.	The project has received support from the EU Horizon and Altener programmes, the Department of Agriculture and Food and the local LEADER company.	Camphill Communities of Ireland is part of an international charitable trust working with people with intellectual disabilities and special needs. There are several camphill communities working on renewable energy initiatives.
Cloughjordan Eco-Village*	Tipperary	Eco-village District Heating system and ground-mounted solar panels.	2009	The plant was first fired up in October 2009. The solar panels are now in place.	Community Heating System not-for-profit Cloughjordan Ecovillage Service Company	Heating for homes	Wood-powered community heating system bac ked up by 500 sq m of solar panels.	The District Heating system has received grant funding from the SERVE project of the EU Concerto programme and the House of Tomorrow programme of SEAI.	
The Donegal Woodland Owners Society Ltd (DWOSL)	Donegal	Wood fuel supply	2008	By organising into a group, woodland owners in Donegal can increase the saleability of their produce. Members have already seen huge cost savings.	Co-operative. DWOSL has over 140 members who between them own approximately 10,000 acres of woodland.	Supports and promotes sustainable forest management, use of wood as a fuel and timber marketing		DWOSL has been financed by membership fees, charges for goods and services and a grant from the Forest Service.	

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Greengrove Biofuels Co-operative	Roscommon and region (Galway, Longford, Westmeath and Offaly).	Woodchip		The co-op has organised the first cluster of plantations between a number of farmers for thinning.	The Co-operative has 23 members. Farmers work in clusters making it worthwhile for contractors and enabling farmers to negotiate better deals.	Also developing a biomass district heating scheme with Roscommon town and feasibility study has been completed			Brings together farmers and forestry owners to develop opportunities for timber and biomass in the region
Kinsale Community Anaerobic Digestion	Cork	Community run anaerobic digester (AD)		In 2011, the project received a grant towards a comprehensive feasibility study which will form the basis of a business plan and planning application.	Transition Town Kinsale will be the co-ordinator and will work with local stakeholders to raise the necessary investment. It is envisaged that suppliers will be shareholders in the enterprise.	A more cost effective biodegradable waste management system, to generate energy and to provide new opportunities for jobs and income.		Rethink, Recycle, Remake (Rx3) programme	Reduce the environmental impact and the cost of waste management and disposal and reduce greenhouse emissions.
Kilmaley Housing Development	Clare	Geothermal and solar	2003/2004	Constructed 2003/2004	District heating and hot water for a community housing development for older people.	Low grade geothermal unit			
Carrick on Shannon Heritage Group	Leitrim	Geothermal heat pumps				Hot water and heating			
Transition Towns	Nationwide	Energy efficiency and renewables				Resilience in terms of climate change and peak oil			
Energy Smart Communities	Dublin	Energy Efficiency		There are six Energy Smart communities; Sutton, Ballinteer, Phibsboro, Drumcondra, Rathfarnham and Skerries.	Offers independent energy advice and project management for homeowners and communities in the Dublin area that want to organise together into Energy Smart clusters.	Energy Efficiency		Avail of discounted energy efficiency measures through bulk buying with neighbours.	
Sustainable Clonakilty	Cork	Energy conservation and local renewable energy generation		Have developed a Sustainable Energy Roadmap.	Voluntary group- The Sustainable Energy Working Group, a sub group of Sustainable Clonakilty, are working towards Clonakilty becoming energy independent by 2020.	Energy efficiency and local renewable generation		This project is supported by the West Cork Development Partnership under the Rural Development Programme 2007-2013.	Renewable Energy Study available on http://www.sustainableclon.com/wb/wb/pages/home-page.php

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Ballynagran*	Wicklow	Zero Carbon Community		Early stages of development	Not yet decided- but likely to be a co-operative	Firstly to focus on energy efficiency but invest in renewables in the future.	600 homes	Wicklow County Council and Greenstar Landfill Levy	
Trim 2025	Meath	A district heating system using biomass grown locally		Early stages of development	Involvement from business, and the public sector (OPW and Meath Local Authorities)	Demonstration project with the OPW , Trim leisure centre and the local GAA club house with the view to extending the system out to the wider community.			Aim to be energy neutral by 2025.
Sustainable Skerries*	Dublin	Energy Smart Community, transition town and developme nt of local renewables		Carrying out an energy review for the Community Centre and Theatre buildings. Initial planning stages in terms of renewable energy.	Local community group	Resilience in terms of climate change and peak oil			
Community Energy Keeping Connemara Green	Clifden Co Galway	Renewable energy		Early stages of planning	Local community group	Renewable energy proposals – hydro, tidal, and wind. Aim 40% renewable by 2020.			Part of a Green Town initiative. Involved in the Clifden School renewable energy project and Greening Clifden Business with the Chamber of Commerce.

* is used to denote that contact was made with someone involved in the initiation or running of the energy project.