

## Glossary of Terms

<b>Emission Trading Directive</b>	Current discussion on the procedure in the EU for trade between areas with low and high carbon emissions thus encouraging compliance with the limits while also allowing flexibility.
<b>Energy intensities</b>	Ratios between energy consumption and economic activity (measured as GDP or value added in €).
<b>Environmental Impact Assessment</b>	The process for anticipating the effects on the environment caused by a development.
<b>Environmental Impact Statement</b>	The document produced as a result of the EIA process.
<b>Environmental Protection Agency</b>	Organisation with responsibility for promotion and implementation of environmental protection and management in Ireland.
<b>ESB National Grid</b>	National electricity infrastructure network.
<b>Feed-in law system/ Electricity Feed Law</b>	The feed-in law system requires electricity utilities to pay a fixed price for all electricity generated from renewable resources.
<b>Fossil Fuel</b>	Oil, natural gas, coal, lignite, peat.
<b>Green Dividend</b>	The positive environmental effect of any development.
<b>Grid Codes</b>	Grid connection and operation of wind farms are controlled by a number of Codes that define the technical aspects of the working relationship between the Transmission and Distribution System operators and users of these systems.
<b>Guild</b>	A partnership which functions like a co-operative.
<b>Kyoto Protocol</b>	UN's agreed protocol for its Framework Convention on Climate Change, first signed in Kyoto, 1992 (188 signatories by February 2003).
<b>Large-scale projects</b>	Projects producing up to 25MW (AER VI price of 5.216 cent per kWh).
<b>Licence to Generate</b>	Licence required from CER before commencing generation.
<b>Memorandum and Articles of Association</b>	The Memorandum and Articles of Association of a company contain the rules and procedures pertaining to the activities of the company.
<b>National Development Plan</b>	National Development Plan 2000-2006 includes an investment of €185 million for energy efficiency and renewables.
<b>National Greenhouse Gas Abatement Strategy/National Climate Change Strategy</b>	National framework for achieving reductions in greenhouse gas emissions to meet Kyoto Protocol requirements.
<b>National Heritage Areas</b>	Designated areas of national ecological and cultural importance.
<b>Net-Metering</b>	A metering system which effectively runs the electricity meter in reverse if the consumer is producing electricity and feeding it into the local grid.
<b>Non Fossil Fuel Obligation (UK)</b>	Requires the Regional Electricity Operators in England, Wales and Northern Ireland to secure specified amounts of electricity from renewable resources.
<b>Non-statutory organisation/ Non-governmental organisation</b>	Independent organisations with private funding.
<b>North/ South interconnector</b>	A connection or link between the power systems of Northern Ireland and the Republic of Ireland that enables them to draw on each other's reserve capacity in time of need.

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<b>Power curve</b>	The Power curve is the measurement of the wind speed over a period of time (velocity per second) relative to the effect (or potential electricity output in kilowatts (kW)). The curve varies significantly with wind speeds, which are higher in the west of Ireland than in many other parts of Europe.
<b>Power Purchase Agreement</b>	A Power Purchase Agreement (PPA) represents an agreement between the power generator (wind farm) and the power purchaser, Electricity Supply Board (ESB) or ESB National Grid (ESBNG)/ EirGrid, as appropriate, for the long-term sale of electricity.
<b>Renewable Energy Information Office</b>	The Renewable Energy Information Office, a national service provided by Sustainable Energy Ireland (SEI) was established to promote the use of renewable resources and provide independent information and advice on the financial, social and technical issues relating to renewable energy development.
<b>Renewable Energy Partnership</b>	A strategic partnership between the Western Development Commission, Brí Nua Community Wind Energy Group and Mayo Community Wind Energy Group.
<b>Risk Capital</b>	Capital investment in high risk ventures.
<b>Security of supply</b>	Requirement for uninterrupted supply within the electricity network.
<b>Shareholders' Agreement</b>	Sets out all aspects of the participants' association on the establishment of a legal structure such as a co-operative or private company limited by shares.
<b>Small-scale projects</b>	Projects producing up to 5MW (AER VI price of 5.742 cent per kWh).
<b>Special Areas of Conservation</b>	Areas covering a broad range of 'priority' habitats and species.
<b>Special Protection Areas</b>	Areas where regularly occurring migratory species and listed rare and vulnerable species of birds are protected.
<b>Statutory body</b>	An organisation that is required to exist by law and was brought into existence by the enactment of an Act of the Oireachtas.
<b>Sustainable Energy Ireland</b>	Sustainable Energy Ireland, formerly the Irish Energy Centre, is Ireland's national energy authority. The authority promotes and assists environmentally and economically sustainable production, supply and use of energy, in support of Government policy, across all sectors of the economy.
<b>System charges/connection fees</b>	Cost of connection and use of the grid network by an energy supplier.
<b>Transmission Grid</b>	High voltage (400 KVa) electricity cables distributing electricity from power stations, often long distances.
<b>Transmission Planning Bill</b>	Soon to be published Bill designed to speed up the planning process for installation of major transmission projects.
<b>Transmission Use of System</b>	Cost of connection and use of electricity network.
<b>Western Development Commission</b>	The Western Development Commission is a statutory body established to promote, foster and encourage economic and social development in the Western Region.
<b>Western Investment Fund</b>	The Western Investment Fund is a €32 million venture capital and local investment fund managed by the Western Development Commission.
<b>Wind resource</b>	The wind resource available at a potential site can be evaluated using the Wind Power Density. The wind power density, measured in watts per square meter, indicates how much energy is available at the site for conversion by a wind turbine.

## Appendix I: Example of possible criteria for prioritising grid access

All renewable energy projects below a certain size, and with a high level of community involvement, should be provided with a connection to the national grid at no cost to the project. The eligibility for such connections needs to be established according to clearly defined criteria. An example of a possible system for assessing eligibility may involve grid connection agreements below a certain size running for ten years. Producers then apply for renewal, competing against other existing producers whose agreements have also expired and against proposals from prospective new entrants. Applications for grid capacity awarded points according to the following criteria.

- 1. Environmental Benefit.** Scored up to a maximum of 20 points. Highest points go to applications from biogas digesters using food waste and animal slurries because they would not only have zero greenhouse gas emissions but would also prevent potential environmental problems. Generators using methane from landfill would also score highly. Low or zero points would go to peat stations because of their high CO<sub>2</sub> emissions and the damage done by peat extraction.
- 2. Reliability and flexibility of supply.** A simple 10-point scale. A thermal power station can be expected to supply electricity perhaps 97 per cent of the time - scoring 9.7 points. A wind farm might supply only 30 per cent of the time, and would get three points. Suppliers unable to supply continuous power would get points if they were able to guarantee to meet peaks in demand - encouraging projects with a power storage capacity.
- 3. Income retained in the local community.** A simple 10-point scale. If 100 per cent of the gross revenue from electricity and other sales (green credits, heat etc.) were retained within a 100-mile radius of the plant, the score would be 10. Peat stations would score well on this measure because of the income they generate in their local areas.
- 4. Location.** Points would be given according to the proportion of the power from the station that would be used within a 100 mile radius from the site. If 100 per cent was likely to be used within that area, 10 points would be scored.

## Appendix II: The Rate of Return Required by Credit Union Borrowers

For all members of a community to be able to invest in a wind energy project, those without savings would need to be able to borrow the capital they require. Several of the credit unions in the Western Region<sup>48</sup> have indicated their interest in becoming involved in such projects.

It would be desirable if those needing to borrow in this manner were able to repay their loans within ten years entirely out of the revenue from the sale of their share of the electricity their wind farm produces. How high would electricity prices need to be for that to be possible? The following is a worked example.

Suppose that a family borrows €10,000 over ten years to invest in a community wind co-operative planning to build two turbines on a farm fitting the Financial Model contained on the CD Rom accompanying this guide. At current interest rates, repayments to the credit union would be €1,400 per annum. In other words, to repay the loan, the rate of return on the family's investment would need to be 14 per cent. This would require an electricity price of 6.5 cent per kWh,<sup>49</sup> provided the family received the payment tax-free. (Members of the Danish wind guilds are allowed to earn up to a certain amount from their wind energy investments without paying income tax and a similar concession could be considered here). This price is above that currently paid for electricity from fossil fuel sources.

Two possible approaches could be used to make up this difference:

### Scenario 1: Public Service Obligation

The difference could be facilitated through use of the Public Service Obligation levy.

### Scenario 2: Capital grants

Those investing in a wind farm could be provided with benefits similar to those which operate under the BES scheme. For example:

The family borrows €10,000 from the credit union and invests in a two-turbine wind co-operative. The co-operative then receives a grant equivalent to the tax benefit that would be received by someone in the top tax rate band under the BES provisions – currently €4,200. The family's total investment would now be €14,200. As the financial model on the accompanying CD Rom shows, the family would receive a return of 10 per cent on the total sum invested if the guaranteed power price was 5.216 cent and it could consequently pay off its loan if, as in the previous example, the income from the wind farm was tax free.

In fact, the only difference between the two approaches is how the higher cost of the wind energy is apportioned. In the first example, the electricity consumer pays the lion's share, while the national exchequer does so in the second scenario.

The Danes attempted to spread the benefits of the tax concessions and the price supports they provided for the development of renewable energy as widely as possible. They did this by setting a maximum amount that people could invest. A similar approach could be taken here with a maximum limit of, say, €25,000. A limit could also be placed on the maximum income from a wind energy project that would be tax-free, say, €3,000 per annum.

<sup>48</sup> Counties Donegal, Sligo, Mayo, Leitrim, Roscommon, Galway and Clare.

<sup>49</sup> If the farm had five turbines, the price required would be 6 cent per kWh, as there are economies of scale in wind farm construction.

## Appendix III: Terminology for calculating return on investment

<b>Cashflow</b>	Investments generate cashflows over their lives. In the preliminary stages, cashflow tends to be negative because of developmental costs. After operations commence, the cashflows are expected to be positive as revenues are received and investors begin to earn a return on their invested capital.
<b>Discounted Cashflow (DCF)</b>	<p>DCF analysis is a technique which is used to evaluate the attractiveness of an investment. All cashflows (both inflows and outflows) are included in the valuation calculations as they occur. Taxes are included when paid (not when fall due) and any working capital required for the project is also included. Depreciation, as a non-cash item, is only included in so far as it reduces the physical outflow of taxes.</p> <p>The cashflows generated by a project are discounted back to the present and the present values of the annual cashflows are totalled to determine the value of the investment at the discount rate or required rate of return specified.</p>
<b>Discount Rates</b>	<p>The rate of return required by an investor has three components:</p> <ul style="list-style-type: none"> <li>● A fee for the use of his/her money</li> <li>● A fee for managing the project in which the money is invested</li> <li>● A fee for taking the risk</li> </ul> <p>The minimum or 'risk-free interest rate' is determined by the financial markets and has been traditionally stated as the 'interest rate paid on government bonds'. Today, the 'risk-free interest rate' includes an adjustment for inflation and ranges for short-term and longer-term rates. With a longer-term investment, inflation is less predictable and thus the risk adjustment may be higher.</p> <p>The internally established required rate of return is the preferred discount rate to use in preliminary feasibility studies. In the absence of an established rate, a rate may be constructed by using a combination of 'risk-free market rates', plus a management fee and a risk adjustment.</p>
<b>Net Present Value (NPV)</b>	<p>The NPV is the sum of the net cashflows for every year in the life of a project, after being discounted at the specified rate. The NPV includes present values of project expenditures and the investment outlays made prior to production, as well as the present values of the cashflows from the actual wind farm.</p> <ul style="list-style-type: none"> <li>● A positive NPV signifies that investment expenditures will earn a higher rate of return than that specified by the discount rate. <b>This is an acceptable project.</b></li> <li>● If NPV is equal to zero, the investment will earn the exact return specified by the discount rate. <b>This is a marginal project.</b></li> <li>● If NPV is negative, the investment will not earn as large a return as specified by the discount rate. <b>This is an unacceptable project.</b></li> </ul>
<b>Internal Rate of Return (IRR)</b>	<p>The IRR is another discounted cashflow indicator. For an investment to be attractive, it must generate sufficient positive cashflows to repay the investment expenditure and also to provide a return for the use of the money. The IRR is a measure of the return on the outstanding balance of the investment for each period in the life of the project.</p> <p>The IRR is defined as that discount rate which will set the NPV exactly to zero.</p> <ul style="list-style-type: none"> <li>● If the IRR is less than the required discount rate, the project will not earn the required return.</li> <li>● If the IRR is greater than the discount rate, the project will earn a better return than that required and the investment is recommended.</li> </ul>

## Appendix III: Terminology for calculating return on investment

<b>Payback Period</b>	The payback method, as a valuation technique, is a measure more of the liquidity of the project than its profitability. The payback period of a project is defined as the number of years required to return the initial outlay. The method should not be used as the principal method of appraisal, but only as a measure of liquidity, as cashflows may extend well beyond the payback period.
<b>Senior Debt</b>	Generally that money which is borrowed from a main (senior) lending institution such as a bank at commercial interest rates. This senior debt would generally constitute the main part of the loan (up to 80%) for development of the wind farm.
<b>Mezzanine Debt</b>	Generally that money which is borrowed from a junior lending institution such as a merchant bank at usually higher commercial interest rates. This more expensive junior debt would generally constitute a smaller proportion of the loan (10%) for the development of the wind farm.
<b>Equity</b>	In this context, equity is money which is input by the community investment company. Individual members of the company may have borrowed their share input to place in the equity basket, while others may have derived their share input to the equity from their personal savings.



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