Is there an appropriate model of community wind turbine ownership for
New Zealand?

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Te Rere Hau, Manawatu (Source: personal photograph)

Abstract

Historically, public ownership of telecommunications, railways, ports, and energy, amongst other infrastructure, has been important in New Zealand. In the electricity sector local authorities generated and supplied electricity from the early 1900s. Thus in a sense electricity generation was in the hands of community owned and operated trading enterprises. However, the reforms of the 1980s and 1990s brought significant restructuring of this infrastructure based on the market model of privatisation. Since 1992 energy companies have been required to operate as successful businesses despite being ultimately owned by community trusts which, in effect, hold the assets of the energy company in trust for the community. However, it is arguable as to whether this model actually pursues social and community objectives.

Community ownership of wind turbines is common in some European countries, but there are currently no examples of this form of ownership in New Zealand. This thesis defines community ownership and by examining case studies in Scotland, Denmark and Australia, proposes a model of community ownership appropriate to wind turbine ownership in New Zealand. Specifically, this thesis seeks to identify community ownership models that are capable of promoting holistic environmental justice by reconciling social justice with ecological justice.

A number of forms of community ownership are identified in the various case study countries and a comparative analysis is carried out of these exemplars. On the basis of these studies it is found to be possible for a form of community ownership of wind turbines to exist in New Zealand that incorporates both social justice and ecological justice principles as holistic environmental justice.

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List of Abbreviations

ATA	Alternative Technology Association
BSX	Bendigo Stock Exchange
CC	Commerce Commission
DSP	Dominant Social Paradigm
DWTOA	Danish Wind Turbine Owners Association
EA	Electricity Act 1992
EC	Electricity Commission
EAA	Electricity Amendment Act 2004
EECA	Energy Efficiency and Conservation Authority
EIRA	Electricity Industry Reform Act 1998
FE	Future Energy
GREL	Gigha Renewable Energy Limited
HICEC	Highlands and Islands Community Energy Company
HIE	Highlands and Islands Enterprise
HREA	Hepburn Renewable Energy Association
kWh	Kilowatt hour
MCE	Ministerial Council for Energy
MED	Ministry of Economic Development
MfE	Ministry for the Environment
MRET	Mandatory Renewable Energy Target
MUHEC	Massey University Human Ethics Committee
MWh	Megawatt hour
NIWA	National Institute of Water and Atmosphere
NSD	New Social Democracy
NZ	New Zealand
NZCPS	New Zealand Coastal Policy Statement
NZEECS	New Zealand Energy Efficiency and Conservation Strategy
NZES	New Zealand Energy Strategy
NZ ETS	New Zealand Emissions Trading Scheme
OCSE	Officials Committee on Sustainable Energy
PCE	Parliamentary Commissioner for the Environment

PRE	Projects to Reduce Emissions Programme
REC	Renewable Energy Certificate
RESF	Renewable Energy Support Fund
RMA	Resource Management Act 1991
ROC	Renewable Obligation Certificate
SEF	Sustainable Energy Forum
SV	Sustainability Victoria
TM	Transitional Measures
UK	United Kingdom
VCAT	Victorian Civil and Administrative Tribunal
VRET	Victorian Renewable Energy Certificate
WCED	World Commission on Environment and Development

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1.Introduction

R enewable energy from the wind has, for a number of decades, been regarded as one of the solutions to the world's energy and environmental problems. In combination with other renewable energy sources such as solar, geothermal, wave and tidal energy generation, wind energy has been seen as a source of 'virtually unlimited and benign electricity generation' (Redlinger, Andersen, & Morthorst, 2002: 8). Wind turbine manufacture has continuously improved over the last thirty years in terms of efficiency, reliability, and reductions in capital cost per kWh of generation. These improvements have led to increasing numbers of commercial wind farm developments in many countries across the globe (Greenpeace & Global Wind Energy Council, 2006; World Wind Energy Association, 2007). However, as commercial scale wind farm proposals have multiplied, in some countries organised opposition to wind farm developments has also increased, as reflected in the spread of organisations such as the Country Guardians (McLaren Loring, 2007).

This thesis explores the potential for an alternative form of ownership of wind turbines in New Zealand. It examines overseas examples of community ownership models, in order to identify whether or not these models are relevant to, and have potential for development in, the New Zealand context. In particular it examines whether a community ownership model can conjoin social and ecological justice principles, as advocated by the environmental justice movement (Schlosberg, 2007).

Chapter 1 scopes this research, introducing the context in which the research problem was formulated, articulating the research question, methodology, key concepts, limitations and the thesis structure.

1.1. The Research Context

The context for this research is an overriding interest in green political theory. The essence of Green politics can be described as equity, ecology, democracy and peace (Woodin & Lucas, 2004). The conjunction of democracy, social justice and ecological

justice in green political theory can be characterised by a number of terms including sustainability, ecologism, critical political ecology and environmental justice.

The term, sustainability, has in recent years become particularly popular with politicians of various hues both in New Zealand and overseas. For instance on Saturday 28 October 2006, at the Labour Party Conference, the Prime Minister Helen Clark sought to link the Labour Party with sustainability by asking:

> Why shouldn't New Zealand aim to be the first country, which is truly sustainable ... I believe that sustainability will be a core value in 21st century social democracy...I want New Zealand to be in the vanguard of making it happen – for our own sakes, and for the sake of our planet. I want sustainability to be central to New Zealand's unique national identity (Clark, 2006).

Later, on 13 February 2007 in her *Statement to Parliament* she made the following assertion:

> I believe that in the years to come, the pride we take in our quest for sustainability and carbon neutrality will define our nation, just as our quest for a nuclear free world has over the past twenty three years (Clark, 2007a).

These statements reveal a tactic of invoking sustainability as a social democratic value at the same time as linking it with the iconic status of a nuclear free New Zealand with sustainability. The National Party have also taken on a conception of sustainability in their *A Bluegreen Vision for New Zealand* (Smith, 2006).

Different conceptions of the term sustainability are reflected in the policy statements of the political parties referred to above. However, nowhere is the clash and conflict over the nature of sustainability more acute than in Green politics where the principle is pivotal (Connelly & Smith, 2003; Smith, 2003). According to Smith a 'commitment to sustainable development not only requires reflection on values associated with environmental protection, but also raises questions of quality of life, social justice, intergenerational justice and democracy' (Smith, 2003: 4). However, the environmental movement itself is pluralistic in nature, with different factions drawing on different conceptions of environmental values (Smith, 2003). In a similar vein, Dobson (2000) holds that environmentalism has both strong and weak connotations, ranging from ecologism to ecological modernisation.

The New Zealand based Sustainable Energy Forum (SEF), whose objective is to promote the transition toward sustainable energy in New Zealand, defines sustainability as:

> the sourcing, transformation, use and management of energy in a manner which improves social well-being, while conserving physical resources, maintaining the integrity of ecosystems, and avoiding the transfer of costs onto future generations (Sustainable Energy Forum, 2007).

This is a useful definition of sustainability because it conjoins social well-being with energy sustainability, key contextual elements in ecologism (Dobson, 2000), critical political ecology (Eckersley, 2004) and environmental justice (Schlosberg, 2007). As Dobson and Eckersley assert in their introduction to *Political Theory and the Ecological Challenge* (Dobson & Eckersley, 2006b: 3) 'writers on social justice find it increasingly necessary to reflect on the issue of intergenerational justice – prompted in part by the way in which environmental 'goods' and 'bads' are self-evidently distributed across time as well as space' - the key concern of environmental justice.

In undertaking this research at the Turitea campus of Massey University, Palmerston North I have located myself in the Manawatu region, which has been identified as having the best wind resource in New Zealand (Ashby, 2004). As a result the majority of the currently installed and under development wind farms are sited there. Furthermore whilst this thesis was being researched in 2007 several more Manawatu based wind farm projects made progress through the consent process. However, none of these existing or potential projects have any element of alternative forms of ownership, such as community ownership.

1.2. The Research Aim

The research aim is framed within the context of how it is possible within Green political theorizing to reconcile ecological and social justice principles, as embodied in a holistic environmental justice in the New Zealand context. My aim is to identify an appropriate model for the community ownership of wind turbines for New Zealand. In order to do this the history of large wind turbine ownership in New Zealand is explored. Existing models of community wind turbine ownership in Denmark, the United Kingdom, and Australia are examined and analysed. These models are then

evaluated using the holistic environmental justice framework in order to try to develop a community ownership model applicable to the New Zealand context.

This research comprises a study and analysis of the prevailing direction of community ownership in Denmark, the UK and Australia, including a detailed case study of the only permit approved community wind park in Australia. Data has been collected using key informant interviews and documentary analysis of secondary sources.

The Australian case study investigates the Hepburn Renewable Energy Association (HREA) which is intending to build Australia's first community owned wind park near Daylesford in Victoria. HREA is both a community of interest and place. This case study is a detailed 'snap-shot' of the Association using interviews and documentary analysis to understand how it has progressed to its current stage of development within the electricity generation policy framework existing in Australia in 2007.

Interview participants were selected using a snowballing technique. Key informants include wind power professionals, academics and activists, with an intention of achieving a sample size of six interviews for each of the four countries; the United Kingdom, Denmark, Australia and New Zealand.

1.3. Key Concepts

1.3.1. What is community ownership?

Community ownership can be defined in a number of ways and is exemplified by different models in different countries. At its most simple it can be defined as local ownership (Toke, 2005a). The Parliamentary Commissioner for the Environment (2006a: 31) defines community wind ownership as:

> making opportunities for the whole community… [it] can take a variety of forms, but the most common structure is when cooperatives form to purchase a turbine/s, sell the electricity to power retailers, and share the revenue among their members.

This is a useful first definition of community ownership which can be further refined into communities of interest and communities of locality or place (Bolinger, 2001).

Toke (2005a) emphasises that community wind power is not necessarily about small projects, even though in countries such as the UK, Australia and Denmark, community ownership has tended to begin with small scale projects.

1.3.2. What is environmental justice?

Most discussions on environmental justice focus on mal-distribution where poor and indigenous communities and communities of colour get more environmental 'bads', fewer environmental 'goods' and less environmental protection (Dobson, 2000; Schlosberg, 2007). The conception of environmental justice used in this thesis follows Schlosberg (2007) who argues for a thorough definition of justice encompassing:

> the expressed concerns of environmental justice groups, the conception of justice to the nonhuman world, and recent contributions of justice theory [including distribution, recognition, capabilities, and participation, to] … offer a broadly accessible, plural and workable framework … [as an alternative to] a single, all-inclusive, holistic theory of environmental justice (Schlosberg, 2007: 8).

Schlosberg, in common with Dobson (1998, 1999) and Low and Gleeson (1998), seeks to combine ecological and environmental justice, arguing that a broad set of theoretical concerns, notions and tools can be applied to both. In this thesis I will refer to this broad form of environmental justice as 'holistic environmental justice'

1.3.3. What is ecological justice?

Most work on ecological justice which can be simply be defined as justice to nature, with the notable exceptions of Dobson and Low and Gleeson, does not pay attention to the issues raised by environmental justice movements (Schlosberg, 2007). Dobson's ecologism is similar to Schlosberg's holistic environmental justice in that ecologism:

> holds that a sustainable and fulfilling existence presupposes radical changes in our relationship with the non-human natural world, and in our mode of social and political life … [whereas environmentalism] argues for a managerial approach to environmental problems, secure in the belief that they can be solved without fundamental changes in present values or patterns of production and consumption (Dobson, 2000: 3).

1.3.4. What is sustainability?

Dryzek (2005) suggests that sustainability began in earnest with the publication on the *Our Common Future*, often known as the Brundtland Report (World Commission on Environment and Development (WCED), 1987) as an imaginative attempt to dissipate the conflicts between environmental and economic values. Whilst there is no consensus on the exact meaning of sustainability 'the concepts of growth and development are redefined in ways that render obsolete the simple projections of the limits [to growth] discourse' (Dryzek, 2005: 16).

1.3.5. What is ecological modernisation?

Ecological modernisation concept came in to being in Europe at a similar time to the concept of sustainability, and sees economic growth and environmental protection as largely complementary (Dryzek, 2005). In opposition to Daly's (1996; 2007) ideas of a steady state economy, ecological modernisation advocates that environmental protection can be a potential source of future growth (Barry, 2005).

1.4. Limitations

There are inevitably limitations to this research. Due to the time-frame and length restrictions of a Masters thesis there are issues that have not been explored in depth. The choice to use an holistic environmental justice framework to explore interactions between social and ecological justice in community ownership, was one choice amongst many that could have been made. Further investigation could be carried out using for instance an ecological modernisation framework. Only brief attention has been paid to the evolution of some of the key conceptions of justice used in this thesis, and the perspectives are Western Pakeha. Further research could also investigate Maori justice paradigms in relation to holistic environmental justice.

Electricity generation from wind energy is the focus of this thesis, but it would have been equally valid to investigate community ownership of other forms of distributive renewable electricity generation, both overseas and within New Zealand.

Greater attention could have been paid to the evolution of co-operative ownership and the operation of trusts in New Zealand in spheres such as the agricultural industry, banking and liquor licensing, but this was beyond the scope of the thesis.

Nascent renewable energy initiatives, and community ownership projects of infrastructure other than renewable energy, such as currently evolving in Eketahuna[1], have not been investigated in any depth, as they are beyond the scope of the original research question. Further research as these projects evolve would however, be beneficial.

1.5. The Thesis Structure

This thesis comprises seven chapters. Chapter two reviews the recent historical development of electricity generation in New Zealand and locates the generation of electricity from wind turbines within this context. Key terminology regarding the construction, siting, ownership and use of turbines is introduced. The New Zealand situation is then contrasted with wind energy use overseas with particular reference to European countries including the United Kingdom. The existing public policy framework in New Zealand is examined including the strategic reviews taking place during 2007. This chapter also locates the place of community ownership models in the existing electricity generation structure and policy framework.

Chapter three reviews the key literature in the field of public perceptions of wind farm location, wind farm design and community ownership. This literature is positioned within the interface between social justice and environmentalism as seen in holistic environmental justice.

Chapter four outlines the research design and method. It begins with definitions of case study and comparative research, before outlining the data selection and collection methods used, and the ethical issues pertinent to this research.

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[1] Both the general store and the petrol station in Eketahuna are community owned.

Chapter 1

Chapter five presents the data collected pertaining to Denmark, the UK, Australia and New Zealand. The Australian section includes the detailed case study of the Hepburn Renewable Energy Association's community owned wind-park now known as Hepburn Wind in Victoria, Australia.

Chapter six discusses the results obtained in the Danish and British examples and the data collected in the Australian case study in the context of the literature review and wind farm ownership in New Zealand in order to formulate a model of community ownership suitable for New Zealand's legislative and policy framework.

Chapter seven summarises the thesis and makes recommendations for the implementation of a community ownership model in New Zealand, on the basis of a critique of the existing structures in New Zealand and lessons learnt from overseas models.

2. Wind Generation of Electricity in New Zealand

Because of its location in the 'roaring 40s' New Zealand has an abundant wind energy resource that is steady in many parts of the country (Barton, 2005; Energy Efficiency and Conservation Authority, 2005; Energy Link and MWH NZ, 2005; Parliamentary Commissioner for the Environment, 2006a). This assertion is supported by Ashby who holds that 'New Zealand has the best overall accessible wind resource of any single nation … large parts of New Zealand have good mean wind speeds year round' (Ashby, 2004: 9). There has been a steady growth in wind generation capacity, mainly being built by incumbent generator companies ('the gentailers') (Barton, 2005). However, even as late as 2001, there was no specific provision in New Zealand law for renewable energy. Until 1999 and the election of the Labour-led government, reliance had been placed on the market to deliver reliability of supply, low prices and energy sustainability. Despite the change in the policy climate since 1999 there is still limited support for renewables[2] in order to increase their deployment or mandate energy retailers to purchase a minimum proportion of their energy from renewable sources (Barton 2005: 143-144).

This chapter reviews the development of the use of the New Zealand wind energy resource within the electricity generation system and then locates this in an international context. It then examines the legislative and policy framework for wind energy generation and retailing in New Zealand, and the broader issues of ownership.

2.1. Electricity Generation Trends in New Zealand

In the last thirty years electricity demand has been increasing at a rate of 2.4 percent each year due, in part, to population growth but more importantly to an increase in electricity use per person (Parliamentary Commissioner for the Environment, 2006a, 2006b). Electricity generation has grown in a corresponding manner to meet this demand. In 2005 New Zealand had an installed generation capacity of 8,858MW and

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[2] Renewable energy is sourced from natural flows of energy occurring in the environment that are continually replenished. (Elliott, 2003).

was using 42,000GWh of electricity per year (Parliamentary Commissioner for the Environment, 2006a, 2006b). Around sixty percent of New Zealand's electricity currently comes from hydroelectricity, with fossil fuels such as coal, oil and gas providing another thirty percent (Energy Efficiency and Conservation Authority, 2005).

2.1.1. Existing wind generation

The first commercial scale modern 225kW wind turbine was commissioned at Brooklyn in Wellington in 1993. By the end of 2003 the total installed capacity had risen to 35.93MW, and by the end of 2006 this figure had risen to 170.28MW (Parliamentary Commissioner for the Environment 2006a). The majority of this capacity is installed in the Manawatu region. For the year ended June 2005 the total amount of energy generated from wind energy was 556GWh (East Harbour Management Services, 2006). During 2007, both Trust Power's Tararua Stage 3 in the Manawatu providing 93MW of capacity, and Meridian's White Hill Wind Farm in Southland providing another 58MW of capacity came on stream (New Zealand Wind Energy Association, 2007). Together, these two projects double the existing installed capacity (Parliamentary Commissioner for the Environment, 2006a).

2.1.2. Proposed or in-development wind generation

Due to the rapid growth of the wind power industry, there is at any one time a number of wind farms either being evaluated for feasibility, seeking consent, consented or under construction (see Appendix 1). Currently proposed generation would lift overall capacity to about 3,000MW (Parliamentary Commissioner for the Environment, 2006a).

2.2. The International Context

2.2.1. Wind generation of electricity

In 2005 seventy five percent of existing wind power capacity was concentrated in five countries: Germany, Spain, the United States, India and Denmark. As can be seen in Figure 2.1, with the exception of Denmark these countries also continued to lead new

wind installation in 2005. To put the case study countries in context, in the same timeframe the total installed wind generation capacity to the end of 2005 was 3122MW in Denmark, 1353MW in the UK, 708MW in Australia and 168MW in New Zealand.

Figure 2.1 World new installed wind capacity 2005

TOP 10 NEW INSTALLED CAPACITY (JAN.-DEC. 2005)		
New capacity	MW	%
US	2,431	21,1
Germany	1,808	15,7
Spain	1,764	15,3
India	1,430	12,4
Portugal	500	4,3
China	498	4,3
Italy	452	3,9
UK	446	3,9
France	367	3,2
Australia	328	2,8
Top 10 – Total	10,024	86,9
Rest of the world	1,507	13,1
World total	11,531	100,0

Source: (Greenpeace et al., 2006: 10)
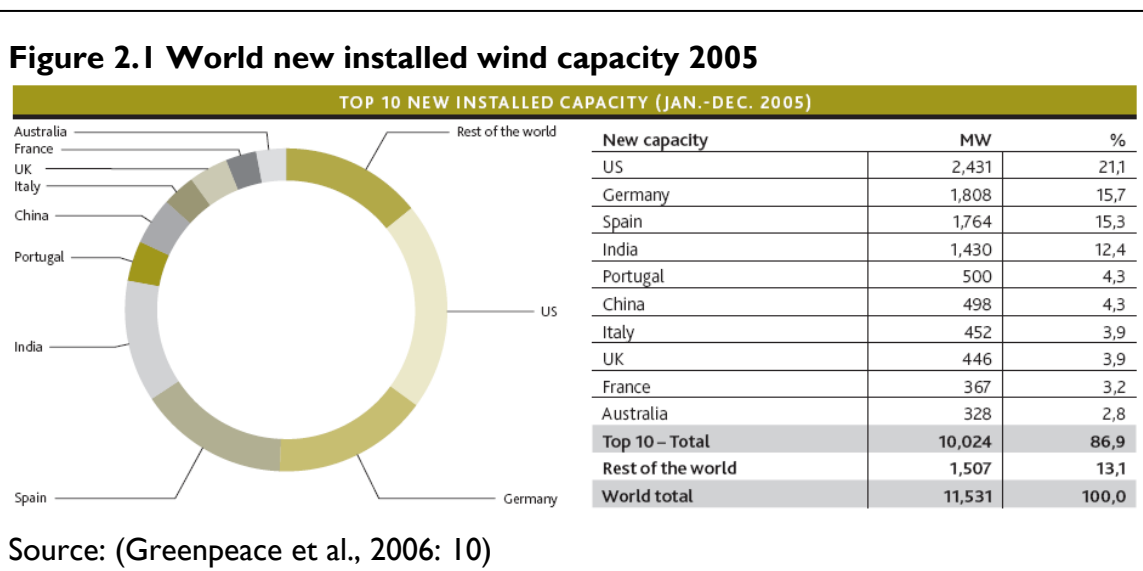
By the end of 2006 total world installed wind power capacity had grown to 73.9GW (73,922MW), an increase of 14.9GW on 2005 figures. In 2006 the World Energy Association expected that 120GW would be installed by 2010, but in 2007 that prediction was increased to 160GW by 2010 (Parliamentary Commissioner for the Environment, 2006a; World Wind Energy Association, 2007).

2.2.2. Policy options to increase levels of renewable electricity generation

A discussion paper *Transitional Measures* (Ministry of Economic Development and Ministry for the Environment, 2006b) discusses a number of policy options used with varying levels of success in different countries to incentivise low emissions generation which are summarised in the following table (Table 2-1). Of the options suggested in the table the most commonly used measures in the case study countries are renewable obligations, and feed-in tariffs, with increasingly a move towards emissions trading. The measures being adopted in the individual case study countries are described in

Chapter 5 and discussed in Chapter 6. This chapter provides a generic description of those most commonly used measures.

Table 2-1 Energy Policy Options

Emissions trading	Carbon dioxide charge	Renewable obligation	Incentives	Direct regulation
- Cap and trade - Baseline and credit - Trading of cross sectoral offsets	- Carbon dioxide charge	- Capacity obligation - Generation obligation	- Capacity subsidies - Feed-in tariff Projects	- Using the RMA - Using the Electricity Act

Source: Adapted from Transitional Measures (Ministry of Economic Development and Ministry for the Environment, 2006b)

2.2.2.1. Renewable Feed-in Tariffs

Renewable Feed-in Tariffs (REFITs) require utilities to purchase electricity from renewable generators at prices at or near the retail price of electricity, which means that generators are able to finance lending with little risk to investors. This results in readily available inexpensive lending to renewable generators and thus rapid development of renewable generation. Because renewable generation is capital-intensive per kW by comparison with fossil fired generation, feed-in tariffs overcome the problems of access to capital for building renewable generation. For those who are adherents to the full electricity market liberalisation, feed-in tariffs are regarded as a distortion in the market place and as heavy-handed state regulation (Komor, 2004). REFITs were first used in California and, until recently, were most common in non-Anglophone Europe. Advanced Renewable Tariffs (ARTs) are a modern version of the REFIT, now widely used in northern Europe. They are a refinement of REFITs in that they are differentiated by technology, size or application, resource or site and have a specific payment life, with a provision for periodic review and account balancing over the project life (Gipe, 2006b: 21-22).

2.2.2.2. Smart meters

'Smart' or advanced or net metering in conjunction with household-scale distributed generation is stated in the *New Zealand Energy Strategy* to be one step towards developing smart networks to manage power demand down to the residential level (Ministry of Economic Development, 2007a). Smart meters can enable more accurate time-based valuation of distributed generation exports, and lower the cost of distributed generation metering for retailers. Net metering as used in the United States, allows small generators to feed excess generation into the grid to 'bank it' for future use when generation is less than consumption. In New Zealand smart meters have been trialled to allow the retailers to control customer energy demand.

2.2.2.3. Renewable obligations

In this quota based system the renewable energy value of electricity generation is unbundled from the underlying electricity, the unbundled renewable element being represented in certificate form. The certificates can be used to track compliance with an obligation and can be traded amongst suppliers (Gipe, 2006b). Suppliers who cannot meet their obligation from their own generation are forced to purchase certificates, and so long as the target obligation is set high enough to make it difficult to meet it will give the certificates a monetary value. Therefore the price paid for renewable generation will be sum value of the price paid for the electricity plus the value of the tradable certificate, theoretically incentivising the building of renewable generation.

2.3. Wind Generation

2.3.1. Wind turbine manufacture and longevity

Internationally, fifty percent of wind turbine manufacture is held by three companies, and this is reflected in the manufacture of wind turbines for the New Zealand market (East Harbour Management Services, 2006). Denmark is a dominant player in wind turbine manufacture due to the long history of wind industry development there. The Danish company Vestas has established a component manufacturing facility in Australia

to serve the Australasian market, and is very active in New Zealand including supplying the turbines for Trust Power's Tararua 3 project.

In New Zealand, Christchurch based Windflow Technology has developed a 500kW turbine design incorporating a torque-limiting gearbox. The majority of the turbine components are sourced from New Zealand manufacturers. As of November 2007 six of these turbines had been installed, (one in Gebbies Pass in Canterbury and five comprising the first phase of the Te Rere Hau wind farm in the Manawatu) and a further forty four turbines were on order (Windflow Technology Limited, 2007a, 2007b).

Turbine life-expectancy is normally expected to be between fifteen and twenty-five years, with the potential for a major overhaul after ten years (East Harbour Management Services, 2006).

2.3.2. Wind turbine configuration and size

The majority of installed wind turbines are three-blade horizontal axis machines with upwind rotors (East Harbour Management Services 2006: 43). The machines manufactured by Vestas conform to this configuration and the turbines recently installed in New Zealand are 3MW machines. The Windflow Technology machines are smaller 500kW machines and have two blades.

Turbines typically now range in height from forty to one hundred metres with a rotor diameter of forty to ninety metres. Doubling the length of the blades on a wind turbine quadruples its theoretical power output (Ashby, 2004).

2.3.3. Wind turbine cost

Ashby (2004) holds that total project costs are likely to be between $NZ1.6 million and $NZ2.0 million per megawatt. According to Ashby, the Australian company, Wind Farm Developments Limited, estimates that every megawatt installed will have an erected cost of $NZ1.65 million (Ashby, 2004).

2.4. Electricity Costs and Pricing

The economics of wind energy are largely determined by the wind speed, which is highly site dependent. In New Zealand, because the majority of turbines are imported, the cost of generation is very sensitive to exchange rate fluctuations. Good wind sites can produce electricity at seven to eight cents per kWh (East Harbour Management Services, 2006). Wind energy generation is generally regarded as being economically viable at seven cents per kWh as compared with hydro at 6.5 cents per kWh and coal at six cents per kWh (Ashby, 2004).

According to Barton (2005) the smaller wind generation companies have particular problems with price volatility in the spot market when, in periods of calm conditions, they have to purchase electricity to meet their commitments.

2.5. The Wind Resource in New Zealand

2.5.1. Turbine performance

Typically, wind turbines produce electricity at wind speeds between four and twenty five metres per second. Because wind speeds are variable, turbines will not consistently produce their rated output. The terms 'capacity factor' or 'load factor' are used to describe the actual performance of a turbine or wind farm. In 2002 the average load factor worldwide was twenty three percent (the turbines produced their rated output for twenty three percent of the time). By contrast, as of 2004 a load factor of between forty and fifty percent had been achieved in New Zealand.

2.5.2. The national wind resource

In late 2003 the National Institute of Water and Atmosphere (NIWA) calculated wind speeds and power density[3] on a national basis at fifty metres above ground level which is indicative of the wind available to commercial wind turbines. The NIWA maps are based on a ten kilometre grid. However, as local topography has a significant effect on

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[3] Power density depends on the energy flow from the wind passing through the swept area of the turbine blades in a unit of time. Wind power density is directly related to air density which reduces with height above sea-level. However, air density is inversely related to temperature.

wind speeds, this data can only be indicative, and wind mast monitoring is required at proposed sites to provide data on which to base any proposed investment. Denmark uses a wind map based on a two hundred metre grid to help prove the wind resource at any particular location. As a result any potential wind development in New Zealand is more reliant on collecting its own data from wind masts than a comparable development in Denmark, with consequent additional costs.

2.5.3. Network issues

In the report *Wind Energy Integration in New Zealand* (Energy Link and MWH NZ, 2005) prepared for MED and the Energy Efficiency and Conservation Authority (EECA) the contention is made that with a penetration of only 2.5 percent by the end of 2005 wind power penetration in New Zealand is still low by comparison with many other countries. There is little agreement amongst experts over the proportion of energy generated from wind that could be absorbed by the electricity network in New Zealand. Ashby (2004) contends that the network could cope with around twenty five percent of electricity being generated from wind before variability and unpredictability factors become too problematic. These problems are related to transmission and distribution bottlenecks, grid reinforcement and grid code compliance. The national grid operator Transpower has identified transmission capacity constraints that require investment, but to date these have largely been based on existing generation scenarios rather than the potential for increased generation from renewables (Transpower, 2004).

Most countries with high wind penetration have high capacity transmission links to the electricity grids of neighbouring countries making it possible to cope with the inherent output variability of wind generation. Because New Zealand does not have such transmission links, has a small load relative to grid size, and relies on a high voltage direct current link between the North and South Islands, it is less able to cope with this variability. However, these problems are to some extent obviated by the high level of hydro-based generation which is complementary to wind generation in its flexibility. Factors which continue to limit wind integration include: frequency management, short term variation in output, generation scheduling, wind farm

clustering and the development of standards and policy (Energy Link and MWH NZ, 2005).

2.6. Central Government and the Allocation of Energy Responsibilities

Despite there being a Minister of Energy in the New Zealand cabinet, there is no ministry of the same name. The Labour-led Government issued an Energy Policy Framework on 3 October 2000, under which specific policy documents were settled in particular government departments, most notably the Ministry of Economic Development and the Ministry for the Environment (Barton, 2005). As climate change issues have risen up the political agenda, more government departments have become involved in this policy area.

2.6.1. Ministry of Economic Development

The Minister of Energy is advised on the operation and regulation of the energy industry by the Ministry of Economic Development (MED). MED also chairs the Officials Committee on Sustainable Energy (OCSE) which advises the Minister on matters of energy supply and demand and the Sustainable Energy Steering Group which progresses strategic policy development on the Government's Sustainable Development Programme of Action (Parliamentary Commissioner for the Environment, 2006b).

2.6.2. Commerce Commission

The Commerce Commission (CC) both enforces legislation specific to the electricity industry and, in a more general sense, legislation that promotes competition and fair market practices. Under the Electricity Reform Act 1998 the CC has both an adjudication and enforcement role (Parliamentary Commissioner for the Environment, 2006b).

2.6.3. Electricity Commission

The Electricity Commission (EC), established in 2003, serves a number of functions including overseeing Transpower's pricing methodology and regulating the wholesale and retail operations of the electricity industry with regard to the Electricity Act 1992 and government energy policy. The EC is tasked with ensuring that electricity is produced and marketed in an efficient, fair, reliable, and environmentally sustainable manner whilst promoting its efficient use (Parliamentary Commissioner for the Environment, 2006b). The EC is required to:

> secure reserves within the electricity system to reduce the risk of shortfalls in periods of very low hydro inflows … [it] has a strong focus on security of supply including that from renewable energy. Renewable technologies are seen to enhance the security of supply by diversifying the energy supply mix (East Harbour Management Services 2006: 97).

As an illustration of this role, in June 2005 the EC produced a consultation paper, the *Wind Generation Investigation Project*. The objective of this project is to:

> identify and quantify the technical and market impacts of wind generation upon the New Zealand power system over the next ten years, and to recommend technical codes and market rule changes to ensure power system security and market outcomes that are consistent with the Government Policy Statement (Electricity Commission, 2005: 5).

2.6.4. Ministry for the Environment

The Ministry for the Environment (MfE) is responsible for the administration of the Resource Management Act 1991 (RMA). It is also responsible for advising the Minister Responsible for Climate Change, monitoring the Energy Efficiency and Conservation Authority (EECA), and working with EECA on relevant climate change issues (Parliamentary Commissioner for the Environment, 2006b).

2.6.5. Energy Efficiency and Conservation Authority

EECA is a Crown entity under the Energy Efficiency and Conservation Act 2000. Its primary function is to advise the Minister of Energy on the promotion of energy efficiency, energy conservation and the sustainable use of renewable energy resources as in the *Renewable Energy - Industry Status Report* (2006) which is produced on a regular basis (East Harbour Management Services, 2006; Parliamentary Commissioner

for the Environment, 2006b). However, at the heart of the 2000 Act is the process for making the National Energy Efficiency and Conservation Strategy which must be reviewed every five years (Barton, 2005).

2.6.6. *Parliamentary Commissioner for the Environment*

With regard to electricity generation the Parliamentary Commissioner for the Environment (PCE) is empowered under the Environment Act 1986, the Electricity Act 1992, the Electricity Amendment Act 2001 and the Electricity Amendment Act 2004. These Acts allow for investigation of existing and potential adverse effects on the environment by the electricity industry and require the PCE to report to parliament on an annual basis on the environmental performance of the EC (Parliamentary Commissioner for the Environment, 2006b).

In the PCE's December 2007 report *The environmental performance of the Electricity Commission 1 July 2005 – 30 June 2006* (Parliamentary Commissioner for the Environment, 2007), the Commissioner states that:

> the electricity sector contributes to the government's climate change objectives by … removing barriers to investment in new generation technologies, renewables and distributed energy (2007: 8).

Whilst she makes no direct comment on community ownership, she does make further comment on the related subject of distributed generation stating that:

> there is a link between removing barriers to distributed generation and the EC's roles in transmission investments. New transmission investments can facilitate distributed generation or create more barriers. The EC should take these connections into account … It is vital that the regulations for distributed generation are completed soon to assist the EC in ensuring that barriers are removed … the Electricity Industry Reform Act 1998 limits the extent to which lines companies can invest in distributed generation. This was enacted on the grounds that if lines companies are involved in both generating and selling electricity to their customers this will give them unfair advantage over their competitors … However, investment by line companies in generation could actually provide the least cost solution to ensuring network reliability (2007: 18).

2.7. Existing Policy and Legislation

2.7.1. The Electricity Act 1992, the Electricity Industry Reform Act 1998 and the Electricity Amendment Act 2004

Between 1 October 1996 and 1 March 2004 the wholesale electricity market, established by the industry, 'ran under multilateral agreements that provided industry self-regulation, without any legislative underpinning' (Barton 2004: 152).   The Electricity Commission took over its statutory control under a 2003 modification of the Electricity Act 1992 and the Electricity Governance Regulations 2003.

The Electricity Industry Reform Act 1998 (EIRA), introduced competition into the electricity industry. In so doing it required the separation of network and generation ownership, forcing the network companies to divest themselves of their generation assets (East Harbour Management Services, 2006). The Electricity Amendment Act (EAA) 2004 modified the Electricity Act 1992 (EA) via an exemption to the separation rules to allow network companies to own limited (particularly renewable) generation capacity in order to manage periods of peak demand. (See Appendix 2 for further details of the modification of the EIRA by Section 46A of the EAA.)

The EAA and amendments to the EA and the EIRA mean that the rules governing distributed renewable generation[4] have been relaxed. Significantly the EIRA removes any obligation from the network companies to supply electricity after 2013 (Ashby, 2004; East Harbour Management Services, 2006). This may put smaller remote communities at risk from disconnection from the supply network (Ashby, 2004) but may at the same time 'provide an opportunity for local renewable energy projects to provide electricity supply from distributed generation' (East Harbour Management Services 2006: 101).

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[4] Distributed generation is connected to local distribution networks rather than the high-voltage national grid. It can be from small or large generation projects including wind developments. Electricity can be bought when the generator is in deficit and sold when in surplus.

2.7.2. *Resource Management Act 1991*

The Resource Management Act 1991 (RMA) is New Zealand's core legislation to promote the sustainable management of natural and physical resources and as such has important implications for energy policy and law (Barton, 2005; Parliamentary Commissioner for the Environment, 2006b). Environmental management is devolved to regional and district councils with decisions being subject to appeal to the Environment Court (Barton, 2005).

2.7.2.1. *The Resource Management (Energy and Climate Change) Amendment Act 2005*

This Act added an explicit amendment to section 7 of the RMA requiring planning and consent authorities to have particular regard for the efficiency of the end use of energy, the effects of climate change and, the benefits to be derived from the use and development of renewable energy (Ashby 2004). The *Renewable Energy – Industry Status Report (year ending March 2006)* prepared for EECA states:

> Ideally, both regional councils and territorial authorities should review their planning documents to see how… section 7 matters can best be incorporated into revised versions of regional policy statements and regional district plans. In practice, this is likely to take place over a period of years…[some] councils may choose to introduce some renewable energy development into their plans as 'permitted activities', in which case resource consent would not be required (East Harbour Management Services 2006: 101).

The Environment Court decision in relation to Genesis Power Ltd[5] on the resource consent application for a wind farm on the Awhitu Peninsula redefined the benefits derivable from renewable energy. These benefits include: security of supply; reduction of greenhouse gas emissions; reduction in dependence on the national grid; reduction in transmission losses; reliability; development benefits; and contribution to the renewable energy target (East Harbour Management Services 2006: 102).

However, the Act has also taken away the ability for regional councils to consider the effects on climate change when making rulings about the discharge of greenhouse gases (Barton, 2005).

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[5] The Energy Efficiency and Conservation Authority v Franklin District Council ECA148/2005

2.7.2.2. New Zealand Coastal Policy Statement

The RMA requires the Minister of Conservation to publish a New Zealand Coastal Policy Statement (NZCPS) which sets priorities for the preservation and protection of the natural character of the coast from inappropriate use and development. From the perspective of wind turbine development the most significant element of the NZCPS is the risk of high visibility structures adversely affecting the coastal environment even if they are located at some distance from it. This is because the NZCPS requires effects outside of the immediate location to be taken into account, even though development where the natural character has already been compromised is encouraged. Ashby argues that 'overall, the NZCPS is seen by the wind energy industry as a significant barrier to obtaining consents, discouraging potential developments' (Ashby 2004: 25). However, it also needs to be recognised that NZCPS embodies significant tensions for government as it endeavours to balance competing and diverse interests in the future development of the New Zealand coast-line. Indeed, in her *Independent Review of the New Zealand Coastal Policy Statement,* Rosier (2004: 9) argues that 'the preparation and implementation of the first NZCPS have effectively generated debate about New Zealand's national priorities for coastal management'.

On 8 March 2006 the Minister of Conservation announced that a Board of Inquiry would review the NZCPS and issues relating to coastal development (Parliamentary Commissioner for the Environment, 2006a). As of January 2008 the Department of Conservation website stated that the 'next major step in the review will be the release in early 2008 of a proposed new NZCPS for public consultation' and that the Minister will 'appoint a board of Inquiry to examine the proposed NZPCS and conduct the consultation process' including written submissions and public hearings (Department of Conservation, 2007).

2.8. Government Documents

During 2006 and 2007 the government has been consulting on a number of documents relevant to the development of wind power in New Zealand. These are examined below.

2.8.1. New Zealand Energy Strategy to 2050

The Draft New Zealand Energy Strategy (NZES) was published in December 2006 (Ministry of Economic Development, 2006a). In his foreword the Minister of Energy states that the aims of the strategy are to 'ensure that New Zealanders reap the benefits of a sustainable low emissions energy system which provides our economy with an enduring competitive advantage' (Ministry of Economic Development 2006a: 3). The NZES was published in October 2007 (Ministry of Economic Development, 2007a). The Strategy's stated aim is to deliver a reliable and resilient system delivering New Zealand sustainable, low emissions energy services. Its priorities are maximising the contribution of cost-effective renewable energy resources while safeguarding our environment, maximising the contribution of cost-effective energy efficiency and conservation of energy, and reducing greenhouse gas emissions. The NZES covers electricity and stationary energy, transport, and sustainable energy technologies. It also looks at the role of the Resource Management Act in consenting renewable energy projects.

The NZES identifies an economic potential of 9,200GWh per year of wind energy potential based on identified prospective generation capable of development at costs less than nine cents/kWh. With particular relevance to this research the strategy advocates: introducing distributed generation regulations to facilitate connection; introducing emissions trading to price greenhouse gas emissions; encouraging the development and use of renewable energy resources; using the RMA to provide greater leadership and guidance on consenting renewable electricity generation; and removing barriers to distributed generation, including small-scale generation (Ministry of Economic Development, 2007a: 19-24).

The Strategy suggests managing intermittent renewable generation, such as wind, by looking at the options for more geographically dispersed development of new wind farms (Ministry of Economic Development, 2007a: 68). Also, Section 62 of the Electricity Act 1992 provides that lines companies must maintain line services to connections established as at 1 April 1998. This section expires on 31 March 2013 and

is to be repealed with a consequence that, following expiry, consumers connected to lines that are commercially non-viable face uncertainty about access to electricity at affordable prices. This situation is being reviewed to present a range of feasible options for consultation to ensure affected consumers continue to have access to electricity after 2013 and that it is delivered efficiently, fairly and reliably (Ministry of Economic Development, 2007a).

Figure 2.2 Electricity generation in 2025 under emissions pricing and efficiency measures
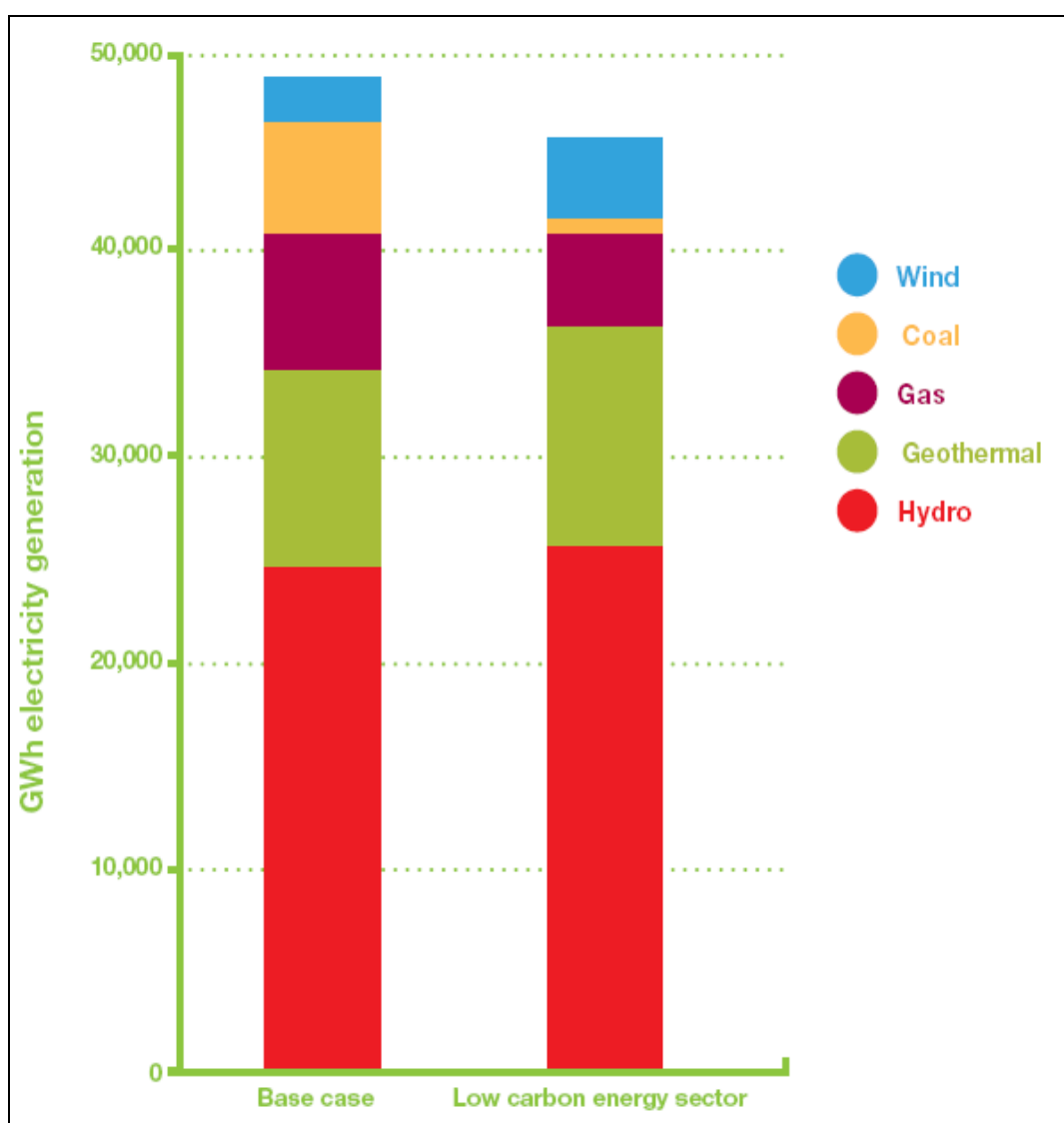
Source: (Ministry of Economic Development, 2007a: 35)

The Strategy states, as illustrated in Figure 2-2, that:

> The introduction of emissions pricing is not expected to reduce the amount of investment in generation, and is likely to increase investment in renewable generation.
>
> Between November 2006 and August 2007, some electricity generators abandoned or deferred previously announced plans to invest in new fossil fuel generation plant and instead began working to develop renewable generation alternatives. This reflects their view of the relative future economics of renewable generation compared to fossil fuel alternatives, including emissions prices (Ministry of Economic Development, 2007a: 62).

Figure 2.3 Typical costs for new electricity generation

NZES new build generation costs

Legend: Wind, Geothermal, Hydro run of river, Hydro storage, Coal, Lignite, Gas CCGT
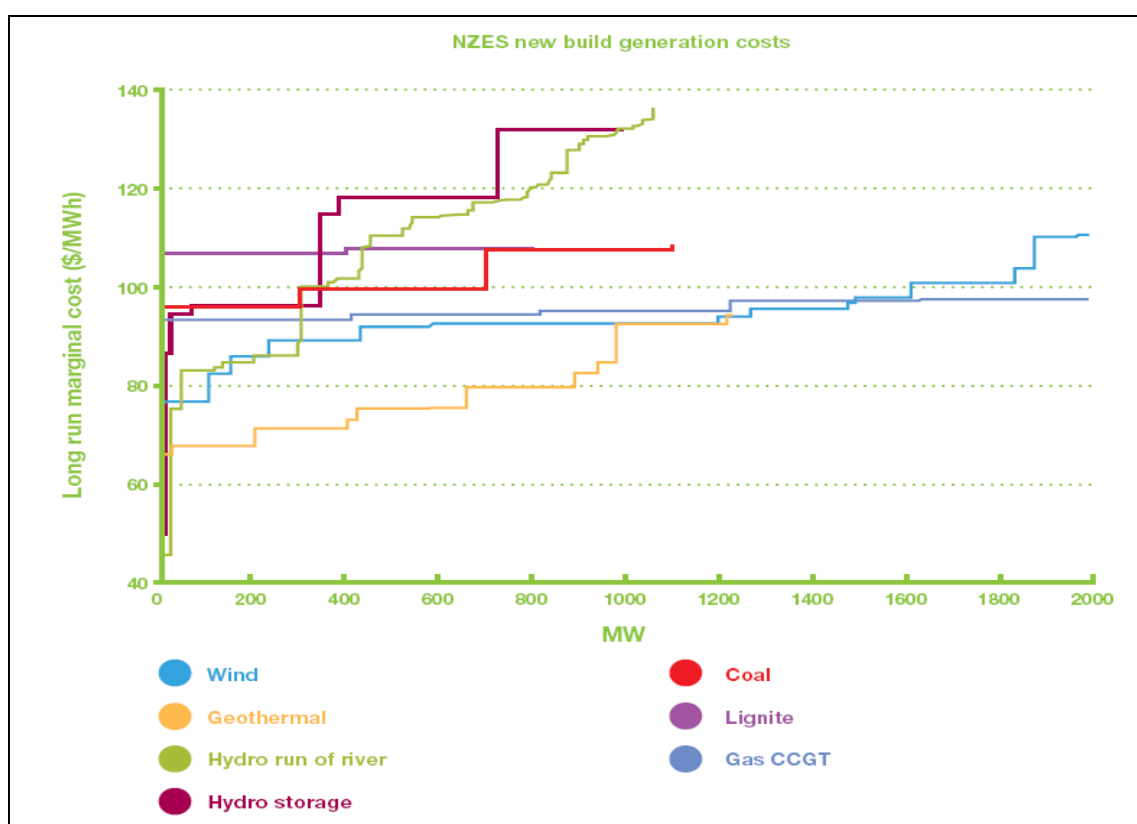
Source: (Ministry of Economic Development, 2007a: 38)

The Strategy also suggests that emissions pricing will increase the competitiveness of renewable alternatives and encourage investment. In the past, New Zealand has had a higher percentage of renewable generation than was the case in 2007.

2.8.2. Report on Submissions – Draft New Zealand Energy Strategy

At the same time as the NZES was released a report on the submissions to the draft was also released. Those submissions included supportive comments from submitters

regarding both community ownership of wind generation (page 30) and feed-in tariffs (page 4). However, these comments did not reach the final strategy (Ministry of Economic Development, 2007b).

2.8.3. Transitional Measures

Transitional Measures (TM) was published in December 2006 (Ministry of Economic Development and Ministry for the Environment, 2006b). This document 'deals with short-term measures to reduce greenhouse gas emissions in the energy sector' (Ministry of Economic Development 2006b: 1). Policy options being considered to encourage low emissions energy supply, including wind, are emissions trading, narrow based carbon charges, renewable obligations, incentives/subsidies, projects, direct regulatory options and voluntary measures.

2.8.4. New Zealand Energy Efficiency and Conservation Strategy

The New Zealand Energy Efficiency and Conservation Strategy (NEECS), released in September 2001 contained two high level targets to be met by 2012: a minimum of a twenty percent increase in energy efficiency across the economy, and, following revision in 2002, the production of thirty Petajoules (PJ) of additional consumer energy from renewable sources (Ashby, 2004). This figure is equivalent to an additional 8,340 GWh per annum or 1,590 1.5MW turbines, assuming that this growth was to be completely met by wind energy. The NEECS does not set specific targets for wind energy and EECA is not empowered to prepare a separate strategy for wind (Ashby, 2004). However, as Barton (2005: 145-146) argues, this is:

> a non-mandatory, 'best endeavours' target with no sanctions, and with limited financial commitments. It is towards the lower end of the range identified in the NEECS the year before. 10-20 PJ of this was predicted to be produced under the business-as-usual scenario…The NEECS … only seeks to shape the way regulatory pressure is used, and does not establish a new regulatory jurisdiction itself.

Barton (2005) suggests that district and regional councils should take the NEECS into account when formulating regional policy statements and regional or district plans and that the NEECS should be consistent with any national policy statement under the

RMA. However, he contends that it does not feature in Environment Court decisions and that 'the policy signal it sends is too weak' (Barton, 2005: 149).

The updated 2007 strategy is the government's action plan that supports the energy efficiency, energy conservation and renewable energy objectives set out in the NZES. One of the objectives of the Draft New Zealand Energy Efficiency and Conservation Strategy, published in December 2006, was to generate more electricity from renewable resources (Energy Efficiency and Conservation Authority, 2006). The renewable energy targets considered in the draft Strategy included targets for the percentage of small scale renewable generation, the percentage of renewable generation used directly and the percentage of renewable generation in overall energy use. Consideration was also being given to a consolidated RMA consenting process for wind and renewable generation by 2008. The NZEECS was published in October 2007. A key target of this revised Strategy is to now have ninety per cent of electricity generated from renewable sources by 2025, incorporating 9.5PJ of additional direct use renewable energy and 30 PJ of savings in non-transport energy per year, leading to a reduction of five to six mega-tonnes of carbon dioxide per year all by 2025 (Energy Efficiency and Conservation Authority, 2007: 12-13).

Importantly the Strategy makes clear that distributed generation, including small scale generation, particularly where it is located close to load 'could also make a useful contribution to achieving the target' (Energy Efficiency and Conservation Authority, 2007: 68).

2.8.5. Climate change policy

New Zealand is committed under the first commitment period of the Kyoto Protocol to reduce its climate changing emissions to 1990 levels by 2012. The short-lived Projects to Reduce Emissions Programme (PRE) facilitated renewable energy projects that were close to being financially viable (East Harbour Management Services, 2006). It did this by awarding Kyoto Protocol emission credits to projects that would reduce emissions in the 2008-2012 commitment period, where that reduction would not have

occurred without the project, and where the project would not have been viable without the credits (Barton, 2005).

In 2005 the Government put on hold its Climate Change Policy, and withdrew the carbon charge that had been due to be introduced in 2007 (East Harbour Management Services, 2006). Subsequently, in October 2007, two new climate change policy documents were published, as detailed below.

2.8.5.1. New Zealand's Climate Change Solutions: An Overview

This publication sets out the challenges New Zealand faces in responding to climate change and the position the government is adopting to deal with the situation. The sister document *The Framework for a New Zealand Emissions Trading Scheme* (NZ ETS), explains the mechanism that the government intends to use to enable the economy to respond to these challenges. The main mechanism is a price-based measure to mitigate climate change:

> Prices are established for units that allow the holders to emit greenhouse gases. Those prices then influence the decisions of producers, consumers and investors throughout the economy, driving emissions reductions and the expansion of more environmentally friendly alternatives (Ministry for the Environment, 2006b: 15)

2.8.5.2. The Framework for a New Zealand Emissions Trading Scheme

The Framework (Ministry for the Environment and The Treasury, 2007) outlines how the various parts of the New Zealand economy will be brought into the scheme in a staged transition. The aim of the Framework is that all major sectors covered by the Kyoto Protocol be included in the emissions trading scheme (NZ ETS) by 2013. This will impact on the energy sector, with implications for the expansion of wind generation. The NZ ETS will introduce an:

> emissions price [that] will increase the cost of transport fuels and other non-renewable energy (such as coal and natural gas), and will cause relative price increases in other sectors that involve emissions, such as industrial processing and agriculture. Conversely, it will reduce the relative price of low-emission goods and services and increase the relative returns on investment in low-emissions technologies (e.g., making it more cost-effective for electricity generators to invest in renewable energy such as wind and solar power) (Ministry for the Environment and The Treasury, 2007: 10).

The framework allows that the NZ ETS could potentially be augmented by an offsets mechanism, which would allow the non-ETS obligated to earn emissions credits from activities resulting in a reduction in the total emission of greenhouse gases. This augmentation would be similar in nature to the abandoned PRE initiative which allowed Meridian Energy to be awarded tradable Kyoto Protocol units for the Te Apiti wind farm.

2.8.5.3. What is missing from climate change policy?

'Peak oil' is the transition from one hundred and fifty years of increasing oil supply to a future characterised by decreasing supplies and the consequences of that decrease (Campbell, 2005; Heinberg, 2006). 'Peak oil' and climate change are two sides of the same coin and solutions to 'peak oil' can also address climate change (Green Party of Aotearoa New Zealand, 2007). Daly, in making that same connection, suggests that there is:

> a bright side to peak oil if we can adapt to it. Obviously lower inputs of petroleum will, other things being equal, reduce outputs of CO_2 and greenhouse effects, albeit with a lag. Also, higher prices for petroleum will act not only as an incentive for more efficient technology … [and also] increasing local self-sufficiency (Daly, 2007: 122).

However, the *Oil Price Assumptions for Energy Outlook* (Ministry of Economic Development, 2005) which underlie the NZES use a base oil price scenario and an alternative high oil price scenario which both assume a decline in oil price between 2010 and 2015. This is a controversial approach and these assumptions mean that, in government projections, the effect of 'peak oil' on the economy is minimised and energy policies are not designed to cope with consistently high oil prices. As a result some policy alternatives such as significant progress with regard to distributed energy are not seen as economic. This lack of progress on distributed energy initiatives is commented on by the PCE in her 2007 report on the environmental performance of the EC (Parliamentary Commissioner for the Environment, 2007).

2.9. Community Wind Turbine Ownership

Historically public ownership of telecommunications, railways, ports, and energy amongst other infrastructure has been important in New Zealand, and in the electricity sector local authorities generated and supplied electricity from the early 1900s (McKinlay, 1999; Teahan, 2000). Thus, in a sense electricity generation was in the hands of community owned and operated trading enterprises. However, the reforms of the 1980s and 1990s saw significant restructuring of this infrastructure based on the market model of privatisation. Since 1992 energy companies have been required to operate as successful businesses despite being ultimately owned by community trusts, which in effect hold the assets of the energy company in trust for the community. McKinlay (1999), states that most energy trusts hold their assets primarily as shares, with an obligation to pay at least the majority of their income to their customers as a rebate. However, within these parameters the trustees are entirely responsible for management of income and capital. It is arguable as to whether this model actually pursues social and community objectives as 'energy trusts have no obligation to consult with their communities and usually no mechanism for understanding what the attitudes of their beneficiaries might be' (McKinlay, 1999: 153).

As noted in Chapter 1, the PCE (2006a: 31) suggests that community ownership occurs when a local community has a significant and direct stake in a wind project. It 'can take a variety of forms, but the most common structure is when cooperatives form to purchase a turbine/s, sell the electricity to power retailers, and share the revenue among their members'. Currently, there are no examples of community wind turbine ownership in New Zealand. However, several ownership vehicles may be available in New Zealand which could lend themselves to community ownership, the most likely vehicle being a form of cooperative.

2.9.1. Cooperatives

The New Zealand Companies Office defines a cooperative as 'a form of business organisation that is owned and democratically controlled by its shareholders/members … run for the mutual benefit of its shareholders/members' (Companies Office, 2007). In the New Zealand context cooperatives have traditionally been agricultural based

businesses and produce marketing companies. The main forms of cooperative organisation are cooperative companies where sixty percent of the voting rights must be held by transacting shareholders; those who supply, buy from or use the services of the company, and Industrial and Provident Societies. A 1939 amendment to the Industrial and Provident Societies Act 1908 requires that a society has to be either a *bona fide co-operative society* or conduct an activity that will *improve the conditions of living or the social well-being of members of the working classes* or be for *community benefit* (Companies Office, 2007).

In a report commissioned by the Department of Trade and Industry in the UK four different types of co-operative are identified:

• Consumer – members are consumers of the products and/or services delivered by the co-operative

• Agricultural – members are primary producers who come together to invest in processing equipment, distribution services and/or joint marketing

• Investor – members are generally drawn from the local community (though they can be from further afield) and come together to invest in specific projects

• Secondary – members are co-operatives who come together to further their mutual interest by pooling their collective resources and establishing shared services (Department of Trade and Industry, 2004: 12)

2.10. Conclusion

This chapter has laid out the New Zealand legislative and policy framework pertaining to wind energy generation of electricity, contextualized within the global perspective. As such this chapter provides the policy landscape onto which the research data can be mapped. It has been noted that wind generation development in New Zealand has been concentrated spatially, in time and in ownership. Despite New Zealand having a world-class wind resource, development has been relatively slow and subject to policy ebbs and flows. Current policy direction aimed at focusing on measures to mitigate climate change has the potential to support further wind generation development, but does not address issues pertaining to 'peak oil' or community based measures such as community ownership.

3. Literature Review

3.1. Introduction

This chapter examines community ownership models and renewable energy generation in the context of holistic environmental justice. I discuss some of the key concepts of green political theory: environmentalism, ecologism, communitarian theory and community before reviewing a number of elements of holistic environmental justice. Subsequently this will enable the research results detailed in Chapter 5 to be analysed in Chapter 6 in the context of this body of thought.

This research seeks to find an appropriate model of community wind turbine ownership for the New Zealand context in the broader field of green political theory. The New Zealand context encompasses the legislative and policy framework canvassed in Chapter 2, the political history of New Zealand, and the theoretical literature impinging on the various elements of the community ownership model. As Cahill and Fitzpatrick (2002) suggest, the welfare state does not exist in a different realm to the environment and, as such, issues of social justice and environmental sustainability are intrinsically linked, even though as pointed out later in this chapter, they are, according to some theorists, hard to reconcile. The political philosophy underlying this thesis is that if a successful model of community ownership is to be identified for the New Zealand context it must endeavour to reconcile environmental sustainability with social justice to be truly sustainable. In this chapter I review various facets of the theoretical literature that are relevant to this reconciliation. I will base this discussion around the framework of holistic environmental justice, as described in Chapter 1 because it usefully brings together issues of community, justice, citizenship and place-identity. This conception of holistic environmental justice argues for ecological justice and sustainability and therefore squarely faces issues of climate change and renewable energy generation. As Bulkeley and Walker argue, from a UK perspective, the concept of holistic environmental justice is increasingly seen as:

> a means of reconciling the sustainable development agenda with that of social justice … by recasting the relationship between society and nature in more than economic terms, and by illuminating the significant social dimensions of environmental contests and conflicts (2005: 329).

This reflection is also arguably true of the situation in New Zealand with regard to wind farm development.

3.2. Renewable Energy and Community Ownership

In the UK, New Zealand and Australia there are few examples of renewable energy development of any kind with high levels of local leadership or involvement (Devine-Wright, 2005a). This is in marked contrast to European countries such as Denmark, Sweden and Germany, where high levels of community ownership in a variety of forms, have been achieved (Bolinger, 2001). Nevertheless, in all the countries examined in this study, there is an existing or increasing focus on popular, practical and political aspects of renewable energy including wind energy. This, however, is not a new focus and can be traced in particular to the 1970s and the work of Lovins (1977; 1989) Schumacher (1973) and Dunn (1978).

Lovins argues that there are two alternative scenarios for the development of the energy system. The first is a hard energy path where non-renewable fuels continue to be used in an inefficient manner to produce electricity 'in ever larger, more complex, more centralized plants' (Lovins, 1989: 1). The second path (which he calls a soft energy path) results from his redefinition of the energy problem into an end-use, least-cost approach combining energy efficiency and appropriate renewable energy sources which asks a series of interlinked questions:

> What do we want energy for? What are the end uses we are trying to provide, such as comfort light and torque? And how much energy, of what kind, at what scale, from what source, will meet each of those end uses in the cheapest way? (Lovins, 1989: 2)

This is an attitude paralleled in Schumacher's seminal *Small is Beautiful: a Study of Economics as if People Mattered* (1973) which advocates small or human-scale development based on a 'Buddhist' economic philosophy of production, forging social bonds by encouraging people to work together. Like Dunn (1978), Schumacher

upholds 'appropriate' scale production and 'intermediate' technology (Agyeman, Bullard, & Evans, 2003: 278). Whilst Dunn concentrates on the application of intermediate technology to 'developing' countries, his stress is on using local resources and progressively building up skills in a local community as being important to the contemporary development of community ownership of wind turbines (1978: 3). A similar approach has been taken to the development of wind energy in some European countries, such as Denmark, where cooperative structures have been used to promote localised development (Devine-Wright, 2005a). It becomes clear that local and distributed energy is not resource or scale specific, and these features distinguish it from the supply-led energy systems that have arguably dominated energy policy in the United Kingdom, Australia and New Zealand. As Pasqualetti (1999) holds, renewable energy generation does not necessarily create the psychological and spatial distance between generation and use that is intrinsic to those supply-led, hard energy infrastructures prevalent in the countries listed above. Devine-Wright argues that:

> the increasing prevalence of smaller-scale, embedded or distributed power systems using local energy resources, is resulting in a greater importance associated with non-technical, specifically social and psychological aspects, of energy generation, supply and consumption such as social capital and community involvement (2005a: 59).

Whilst ecologism can be traced through the environmental concerns expressed in a large body of literature such as Carson's *Silent Spring* (1962), Goldsmith's *Blueprint for Survival* (1972) and The Club of Rome's *The Limits to Growth* (Meadows, Meadows, Randers, & Behrens, 1974), the confluence of ecologism and community ownership of energy generation is seen in the work of Schumacher. He argued that humans have regarded energy as an 'income' that is constantly being topped-up rather than 'natural capital' which is being depleted. Daly (1996) also fundamentally questions the quest for large-scale production, accumulation of capital and relentless growth as encapsulated in industrialism in his discussion of the law of entropy and its application to the environment and economic policy. The depletion of hard energy resources is a clear manifestation of industrialisation and the law of entropy. Ecological economics seeks to address the inevitability of entropy by applying ecological principles to public policy in order to slow down the entropy effect. In order to do this policies and actions must be judged against the principle of sustainability, the capacity of a system to maintain its health and thereby its existence (Agyeman et al., 2003). In terms of energy

policy, renewable energy forms are, in Schumacher's terms, income, whereas non-renewables are natural capital, and sustainability requires the application of ecological economics. Agyeman argues that Schumacher's views are congruent with light green politics where sustainable growth is attainable. In some senses this perspective is sympathetic to the views of eco-socialists such as Pepper (1993) who argue that capitalism rather than industrialism is the problem and that sustainable economic growth remains attainable.

As O'Riordan (2001) makes clear, local action in communities is key to tackling global environmental change and for local action to take place social connectedness is crucial as a manifestation of citizenship. Dobson and Bell (2006a) suggest that in contrast to market-based measures, citizenship approaches to sustainability acknowledge a potential gap between self-interest and environmentally responsible behaviour. It is this gap that community ownership models can potentially fill. Barry (2006) argues that the environmental citizen will not only be concerned with environment but also the social and economic practices that sustain unsustainability, a preoccupation that is reflected in the field research, and reflected in the literature on adaptive governance or co-management.

Nash and Lewis (2006) argue that liberal democracies are atomised and individualistic and as such are unlikely sources of the ecological consciousness and responsible citizenship necessary to hasten a sustainable society (although not totally improbable, as is shown in the Danish case study in Chapter 5). This could be one reason for the slow progress in community ownership in most of the countries studied in this thesis. Nash and Lewis use the term the 'dominant social paradigm' (DSP) to explain the cultural values that have been empirically demonstrated to discourage individual or collective environmental action. They identify three dimensions of the DSP: technological, economic and political. The technological dimension assures citizens that dominant industrial institutions (such as electricity gentailers) will address, via techno-fixes, ecological problems for society and so there is little need for citizens to change their own lifestyles. The economic dimension is characterised by continued economic growth promising ever increasing levels of material well-being. The political dimension is built on freedom being conceptualised as freedom to consume and

participate in free markets as self-interested individuals. Importantly, Nash and Lewis's research suggests that DSP has a much weaker influence on local environmental attitudes than on general or national attitudes. Therefore, grass roots, bottom-up citizenship processes such as community ownership models have much greater potential for sustainability than top-down initiatives. Bottom-up initiatives are community reactions, actions, organisation and empowerment (including participatory decision making) dealing with problems or issues that may be externally generated, whilst top-down initiatives are largely generated from the actions of international and national governmental structures and organisations such as think tanks (Agyeman, 2005).

Trust has been a focus of recent research by Walker et al. in terms of 'how interpersonal and social trust is implicated in the different meanings given to renewable energy programmes and projects, and in the qualities and outcomes that are implied or assumed by taking a community approach' (Walker, Devine-Wright, Hunter, High, & Evans, 2007). They suggest that although interpersonal and social trust are functional for community renewable energy, and can indeed be enhanced by the adoption of a community approach they cannot be either assured or assumed. Communities can be exclusionary and marginalising (Young, 1990) transient and dynamic (Walker et al., 2007) and overlapping in the sense of communities of place and interest (Delanty, 2003; Walker, Hunter, Devine-Wright, Evans, Fay, 2007).

Local or community ownership of wind power can have a variety of meanings and the terms are sometimes used interchangeably. Definitions are often rooted in ideological theories with co-operatives (the legal forms varying across national boundaries) being regarded as the purest form of community or local ownership (Toke, 2008). This is reflected in Toke's commentary that local wind power co-operatives have 'gone down in wind power folk lore as the political 'holy grail' for green and left wing idealists interested in renewable energy' (2008: 156). However, despite this 'folk lore', only one of the countries, being researched in this study, Denmark, shows a significant number of examples of renewable energy development with high levels of local involvement or leadership (Devine-Wright, 2005a). Toke admits that:

> I must confess that a few years ago I was one of the people who argued for a 'community wind power only' strategy in the UK (Toke and Elliott, 2000). This

was, it has to be said, at a period when there was practically no wind development activity at all and the wind power industry seemed to have made an absolute mess of the opportunities (such as they were) presented by the then renewable energy support system, the Renewable NFFO (Toke, 2008: 170).

By contrast, Toke now contends that the development of wind power is the most important factor, in the UK context, to combat carbon dioxide emissions and to counter the government push for nuclear power. To that end he asks: 'Will opposition to corporate efforts to develop wind power reduce arguments for new nuclear power stations?' His rhetorical answer is that it will not, 'for the practical effect of a failure to support corporately financed renewable energy will be to reduce the amount of renewable energy, not increase it' (Toke, 2008: 170).

From Toke's perspective, therefore, what is required is increasing support for wind energy *per se*. This perspective is widely supported but raises the question of why, in countries including the UK, Australia and New Zealand, there is significant opposition to proposed wind farm developments? Governments in the UK and New Zealand have recognised the feasibility of renewable technologies and their environmental, social, economic and security advantages, but also recognise that implementation has remained slow and problematic (see for a UK example Economic and Social Research Council, 2006). The New Zealand government emphasises the use of hydro and geothermal electricity generation but admits that other renewable generation, such as wind will still only meet a small proportion of electricity demand, despite New Zealand's significant wind resource (Ministry of Economic Development, 2006a).

In the UK, reports such as the *Energy White Paper* call for 'greater involvement from local communities' in the energy system (Department of Trade and Industry, 2003: 16), whilst the New Zealand government remains largely silent on the issue. As Pasqualetti (1999) points out, centralised infrastructures, such as corporate models of wind generation ownership, deliberately create spatial, and, as a result, psychological distance between energy generation and use. Devine-Wright (2005a) develops this argument to suggest that smaller-scale, local embedded or distributed energy systems emphasise the social and psychological aspects of energy generation, supply and consumption such as social capital and community involvement.

Using Putnam's characterisation, social capital can be calculated in terms of both the number and strength of an individual's networks (Putnam, 2000). By contrast, corporate ownership models tend to be low on social capital within the communities in which they seek to site renewable energy developments such as wind farms. Wind farms that are actively promoted by local owners are theoretically more likely to gain permit approval (Toke, 2005c). A study by McLaren Loring (2007) using case studies from England, Wales and Denmark, further suggests that projects with high levels of participatory planning are more likely to be publicly supported and successful, and in addition stable supporting networks are more likely to form. However, in McLaren Loring's case studies, project acceptance is not related to the existence of those stable networks of supporters, but instead the absence of a stable network of opponents is found to be necessary for project acceptance and planning permit approval. This is a significant conclusion, suggesting that disruption of opponents is more important than gathering a support base. However, it could be argued that a stable and informed network of supporters is what is required to undermine a network of opponents and that effective local participation and consultation is what is necessary to generate such supporters. Hinshelwood and McCallum (Hinshelwood, 2000; Hinshelwood & McCallum, 2001) in their studies of the Welsh Awel Aman Awe community-led wind farm project contend that there are small but well networked campaign organisations that mobilise and support people to fight renewable energy initiatives. However, at Awel Aman Awe:

> recognising the power of local voices and local action … [the organisation] … pitched the project around local participation and decision making. In particular the project stresses the need for awareness-raising, training and local employment, and therefore a programme of capacity building is integrated throughout (Hinshelwood et al., 2001: 6)

3.3. Environmentalism and Ecologism

Ecologism owes its roots to ecology, the study of the relationship between living organisms and their environment. Ecologism, as defined in Chapter 1, presupposes that a radical change in our relationship with the non-human world, and our mode of social and political life is required (Dobson, 2007). Ecologism takes fundamental issue with the assumptions of conventional politics that there are unlimited possibilities for

material growth and conventional notions of prosperity and as such is a distinct political ideology in its own right (Dobson, 2000). Ecologism critically rethinks the relationship between humans and the natural world and, in doing so, rejects the Lockian notion of humans as masters and possessors of nature (Agyeman et al., 2003). By contrast environmentalism argues for a managerial approach to environmental problems, it is often associated with a moderate/reformist approach to the environment whereby ecological crises are approached without fundamentally questioning conventional assumptions about economic, environmental, social or cultural well-being (Dobson, 2007: 2).

Dobson refers to the 'stubbornly resistant need to keep ideologies apart' (2000: 7) particularly in the context of the relationship between ecologism and environmentalism. He suggests that '*environmentalism* is a word that could quite happily be pressed into adjectival service by virtually any ideology' (Dobson, 2000: 7) without creating contradictions, and ecologism is the ideology least likely to be hybridised by environmentalism. 'Environmentalism is so easily accommodated by other ideologies and ecologism is so different from these ideologies that we need to be very careful before allowing environmentalism to be a strand within ecologism' (Dobson, 2000: 7).

One conception of environmentalism is known as ecological modernisation, a managerial approach that 'does not fundamentally challenge social, economic and political practices' (Connelly et al., 2003: 70). It is arguably the dominant conception of sustainable development focusing on the efficient use of resources within a capitalist framework, valuing nature only as a resource (Smith, 2003). There are strong and weak versions of this conception (Christoff, 1996) ranging from the techno-corporatist to a stronger reflexive version (Carter, 2001). However, according to Carter all forms of ecological modernisation largely ignore issues of equity and social justice, both within industrialised nations and between nations (Carter, 2001; Smith, 2003).

This distinction between ecologism and environmentalism is important for this thesis because managerial approaches to the environment characterise many western governments' approach to environmental policy. Dryzek (2005) argues that the

western governments who have had been the most successful in terms of environmental policy performance have been the non-Anglophone ecological modernisers. However, Barry (2005) suggests that whilst the UK government is publicly committed to sustainable development its aims are more amenable to the discourse of ecological modernisation.

3.4. Communitarian and Cosmopolitan Theory

Eckersley (2006) asks the question 'Does communitarianism provide the appropriate insights, conceptual resources and norms to guide political communities along ecologically sustainable paths?' (2006: 91). In common with many other writers on the subject, Eckersley suggests that this question is difficult to answer due to the breadth of views within communitarianism and she contends that it is easier to identify what communitarians are against than what they are for. However, anti-cosmopolitanism and a preoccupation with questions of identity and the significance of social bonds in Eckersley's view, unite communitarians. This opposition to cosmopolitanism[6] could be regarded as a barrier to communitarians meeting the ecological challenge, as she suggests that local action may be insufficient to arrest the growing gap between those who generate ecological risks and those who suffer the consequences. However, Eckersley argues that the primary response of 'ecocommunitarians' (ecologically focused communitarians) to trans-boundary ecological problems is 'to work creatively with the moral resources within the particularistic communities towards sustainability', working with local knowledge and resources to develop our ecological selves and ecological affinities (2006: 103).

John Rawls considers that for a society to have a high state of welfare it must justly distribute resources, benefiting the least advantaged most. In what Rawls calls 'justice as fairness' social welfare 'requires the elimination of unjust inequalities, rather than inequalities per se' (Fitzpatrick, 2001: 13). Communitarians, in contrast to liberals such as both Rawls and Nozick, hold that belonging to a community of the good is more important than the right to individual choice (Little, 2002).

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[6] Cosmopolitanism is a trans- or international conception of citizenship where the political-moral space in which citizenship operates is the whole of humanity (Dobson et al., 2006a).

Communitarians come in a wide variety of hues, and many theorists who have been identified as communitarian would not necessarily label themselves as such.   Little (2002) suggests that concepts of community can range from the conservative, which according to Little, are exemplified by David Green, Amitai Etzioni and Charles Taylor, to the radical progressive conceptions of Andre Gorz and Bill Jordan and the radical democracy of Chantal Mouffe.   The normative component of communitarianism can romanticise the concept of community into a utopian, repressive exclusivity.   The radical component has a great deal of resonance with green, feminist and anti-racist theorising in that it supports the interconnectivity of individuals and defends the social justice policies that support households and communities, and with other new social movements in general because community ranges further than place to cyberspace and beyond.   By focussing on the political Fitzpatrick (2001; 2003; 2005) sees much more in common between communitarianism and the right than the left.   In particular he focuses on the NSD (new social democracy) utilisation of communitarian vocabulary by Bill Clinton and Tony Blair whereby:

> any radical implications of communitarianism were quickly drowned out by a moral authoritarianism that stressed the duties of the poor…which tied rights into responsibilities…which focussed on the 'undeserving' poor …and that repudiated the ideology of the free market (although usually not the practice) (Fitzpatrick, 2001: 82).

This view of communitarianism is also supported by Cohen who refers to communitarianism as a 'briefly spawned' social theory of renascent liberalism, 'a specious sociological gloss on the Third Way', and a 'set of largely vacuous postulates which promptly wilt … under scrutiny and analysis' (Cohen, 2002: 169).

A very different view of communitarianism is promoted by Etzioni. In his foreword to Etzioni's *The third way to a good society* (2000) Tom Bentley suggests that the 'third way' (or NSD) has been open to criticisms including that it is excessively pragmatic operating on the basis of 'what works' which can be re-characterised as 'what we are doing this week'. Bentley refers to Etzioni as the 'leading communitarian thinker of his age, his use of the phrase 'Third Way' preced[ing] the existence of New Labour [in the UK] … rooted in a clear and compelling vision of the good society' (Bentley in Etzioni, 2000: 9). From a diametrically different perspective to Cohen and Fitzpatrick, Etzioni suggests that a good society requires a balance between state, market and community, communities providing an indispensable meaning and purpose to individual lives.

Chapter 3

Significantly in the context of this thesis Etzioni believes that communities are a key provider of collective solutions which are frequently seen as the purview of the state or the market. Etzioni suggests that communities are the space where the tenet that people should be treated as purposes rather than only means, is best institutionalised. Etzioni sees communities as social entities that nourish ends-based relationships, in contrast to the market which is the realm of means-based relationships. He understands communities as providing:

> bonds of affection that turn groups of people into social entities resembling extended families … [and as transmitting] a shared moral culture from generation to generation, as well as reformulating this moral framework day by day. These traits differentiate communities from other social groups (Etzioni, 2000: 15).

According to Etzioni (2000) a good society relies on mutuality (community relationships in which people help each other rather than just those in need) to a greater extent than volunteerism. He also emphasises the importance of care for other communities and thus emphasises both intra and inter-community relationships in the same way that sustainability emphasises both inter and intra-generational equity. Etzioni (2000) also recognises that protecting the environment is part of everyone's social moral responsibilities and is an important source of community jobs and volunteering. Finally, with relevance to the Scottish case study reported in Chapter 5, Etzioni regards devolution, as has occurred in Scotland, as an opportunity to bring power closer to the people so long as it progresses to the level of communities rather than just regions. As such, devolution provides opportunities for citizens to participate in their own government and become politically engaged (Etzioni, 2000).

Coming from a communitarian perspective Little (2002), suggests that the great strength of Iris Marion Young's work is her recognition of the importance of power relations in the form of five sources of oppression to any conception of social justice: exploitation, marginalisation, powerlessness, cultural imperialism, and violence. In this sense 'Young's thought provides us with greater recognition of the practical difficulties of generating social justice than is the case with Rawlsian distributive justice' (Little, 2002: 45). Whilst Young is a serious critic of ideas of community, Little (2002) suggests her politics of difference can contribute to new ways of theorising community, which can in turn lead to new conceptualisations of community that embrace the politics of difference.

According to Little (2002) the radical strand of communitarianism has the strongest links with the concept of justice. Radical approaches to community, such as the radical pluralism of Chantal Mouffe, reject the homogeneity imagined within orthodox communitarianism; a radical understanding of difference implies conflictual and antagonistic politics (Little, 2002). Mouffe suggests that NSD politics:

> imply that we live in a society which is no longer structured by social division. Relations of power and their constitutive role in a society are disregarded; the conflicts that they entail are reduced to a simple competition between interests which can be harmonised through dialogue (Mouffe cited in Little, 2002: 141).

Mouffe identifies a trend for democracy to be overwhelmed by a need to construct a sphere of consensus in politics, which she believes results in some political viewpoints having no means of expression. This she holds can result in exclusionary communities and ultimately vigilantism. To combat these problems radical communitarians argue for an institutional framework that provides a dynamic social and economic structure in which communities can develop.

Cosmopolitanism is in some senses counter to communitarianism in that it emphasises obligations to humanity rather than obligations to co-nationals in seeking to weaken the effects of distance on moral and political communities. Linklater argues that 'concerns about global injustice and the absence of accountability to victims of harm may yet spark the development of deep-seated cosmopolitan emotions' (2006: 111). However, this difference between communitarians and cosmopolitans is not necessarily a tension as cosmopolitan and communitarian arguments are often combined in the same perspective, indeed Eckersley argues for:

> the idea of developmental progression of promising trends in ways that remain mindful of the insights of communitarians while also moving practically toward the ideals of cosmopolitans (2004: 190).

As with communitarianism, there are different versions of cosmopolitanism. The radical liberal idealism of Held advocates for national, linguistic and cultural boundaries having no moral or legal significance. Habermas suggests that an inclusive cultural patriotism based on shared membership of a democratic legal order is required to replace the shared social bonds of the cultural community of the nation state (Eckersley, 2004). However, from a green political theory perspective, Linklater

(2006) argues that the important question is whether emotions such as shame or guilt can become grounds for a moral obligation to the human race, future generations and the environment. Global environmental citizenship can be invoked to draw attention to connectedness both to distant others and the physical environment by redrawing nearness in terms of social and economic connectedness rather than physical proximity. In this context, Barry argues that:

> the more things are arranged so that people really do share a common fate, the better the chance that people will respond to the plight of others, [while] whatever insulates people from sharing common experiences, and facing common problems … makes it more likely that they will fail to recognise the common humanity of a stranger (1980: 460).

Dobson (2005) comments that the obligation to compensate for harm is about justice not compassion, thus requiring the affluent who benefit unfairly from global political and social arrangements that cause environmental problems to do the most to solve those problems. Dobson suggests that cosmopolitan arrangements that begin with the requirement to engage all others in dialogue focus too much on dialogue and not enough on redistributive and restorative justice, 'if harm is being done, then surely more justice rather than talking is the first requirement' (2005: 269). However, Linklater (2006) counters Dobson by suggesting that justice requires equal access to dialogue and that the central theme of discourse based approaches to morality is that all people who are affected have the right to be consulted about actions and decisions (Eckersley, 2004). This debate is central to issues of ecological justice discussed later in this chapter.

3.5. Community

There are a variety of conceptions of community, drawn from arguments regarding tradition, the transformative power of civic association and collective mobilisation, social organisation and belonging, and symbolism (Delanty, 2003). Community can also represent a critique of the status quo and an alternative to society, or the state, that can be characterised as a nostalgic or pluralistic rejection of modernity (Delanty, 2003). At its most simplistic, community is a group of individuals with a common interest that can imply membership, influence, integration, needs fulfilment and shared

emotional connection (Freeman, 2006). Delanty provides a more sophisticated, contemporary conception arguing that:

> the revival of community today is undoubtedly connected with the crisis of belonging in relation to place. Globalized communications, cosmopolitan political projects and transnational mobilities have given new possibilities to community at precisely the same time that capitalism has undermined the traditional forms of belonging. But these new kinds of community – which in effect are reflexively organised social networks of individuated members – have not been able to substitute anything for place, other than the aspiration for belonging (2003: 195).

According to Delanty (2003), community has become a normative term for designating that something is shared amongst a group, when it is generally assumed that nothing is necessarily shared amongst a group of individuals. Community can be looked at from the perspective of the local, political or cultural. When looking at community via the lens of the local, it is clear that one of the unintended effects of capitalism has been to strengthen the value of place, with a consequential, and potentially defensive, desire for community.

However, a community can also have a negative side representing exclusion, elitism and the voice of the most dominant member; a defensive community can be isolationist and authoritarian (Freeman, 2006; Young, 1990, 2000). In order to counter this exclusionary potential, Delanty suggests that one tactic is to promote trust and solidarity within and across communities, strengthening strategies that promote participation and self-sustainment in ecologically sustainable communities. Such a community can be formed around collective action based on place, and the raising of political consciousness, rather than being a reflection of an underlying cultural identity. A community formed around collective action, can be non-locational and individuals can negotiate membership of distinct but overlapping communities that coexist in place and/or space and/or time. These communities can also be virtual communities or communities of interest (Kearns, McCreanor, & Witten, 2006).

Dobson (2007) argues that some form of communitarianism is central to most descriptions of a sustainable society as in Eckersley's depiction of *homo communitas* which suggests that the most revolutionary structures are those that support the development of self-help and community responsibility and are consistent with eco-

utopian ideas (Eckersley cited in Dobson, 2007: 123). However, a utopian perspective ignores other perspectives such as those of the ecological modernisers who have material interest in making profit from managing the environment. Environmental justice advocates such as Scandrett (2000) and Friends of the Earth Scotland (2007) argue that environmental degradation is not egalitarian, but directly linked to lack of political voice. *The Limit to Growth* Report (Meadows et al., 1974) states:

> The majority of the world's people are concerned with matters that affect only family or friends over a short period of time. Others look farther ahead in time or over a larger area – a city or a nation. Only a very few people have a global perspective that extends far into the future (Meadows et al., 1974: 19).

The very few people with a global perspective referred to above by Meadows et al., are likely to be those who already live in sustainable communities or adopt sustainable lifestyles, and it is arguably utopian to expect this lifestyle to have the required universal appeal. Dobson (2007) argues that a utopian political strategy of small community based experiments being used as examples to change people without changing their conditions, with an expectation of a universal acceptance of an interest motive, is counterproductive to green political strategy.

Delanty (2003) argues that communitarianism expects community to provide a normative based social integration via associative principles of a commitment to the collective good. However, the uniting factor between political and local perspectives on community is the importance of belonging consisting of desires, participation, solidarity, commitment and beliefs rather than territorial or institutional structures (Delanty, 2003; Selznick, 1992). Communitarians acknowledge the existence of multiple communities, which can, according to Etzioni, be visualised as 'Chinese nesting boxes, in which less encompassing communities … are nestled within more encompassing ones … [as well as] nongeographic communities that criss-cross the others' (1995: 32). In advocating for inclusive communities, communitarians work to three central propositions: cooperative enquiry, common values and mutual responsibility; and communitarian power relations where all those affected participate as equal citizens (Tam, 1998; Wood & Judikis, 2002).

As noted earlier, Young (1990; 2000) in common with Freeman (2006) and as a radical pluralist, argues that some forms of community can be repressive. She argues for a

form of community that is overlapping and contested around group difference within the wider society, and seeks to empower those marginal groups.

Another version of communitarianism can be expressed as the active citizenship concept of civic republicanism, which can be traced to Rousseau's *The Social Contract,* and can be seen in the work of Putnam (2000) on social capital as a basis for a functioning democracy. Etzioni has been closely associated with the governmental communitarianism of 'third way' or NSD governments in Anglophone countries which stress personal proximity, locality, small groups and personal responsibility for society, and reflect the assimilation of the community discourse into policy-making (Delanty, 2003).

A radical dimension of community can be seen in the notion of communities of resistance or dissent, based around social action, such as new social movements (Delanty, 2003). Rather than focusing on individualism as detrimental to community, new social movement theorising regards individualism as a basis for community activity, and, as such, community can be a means of releasing cultural creativity that is not fully exploited by late modernity. Delanty holds that:

> the culture of individualism and personal autonomy is something that has been the basis of Green politics in many countries and has been expressed in a sense of public responsibility that comes from a collective commitment and the valuing of each person's contribution (2003: 121).

This is a view of community where people from diverse backgrounds can unite in communal activism, which according to Beck (2006) is personalised politics based on reflexivity and autonomy, further based on community as action.

3.6. Holistic Environmental Justice

Arguably the environmental justice movement, as originated in the USA, takes a civil rights and social justice approach to environmental problems. If social justice can be thought of as ensuring all people have access to a basic set of minimum conditions to achieve a healthy life, and if a healthy safe environment with access to enough environmental resources is intrinsic to achieving that healthy life, then environmental justice is crucial to ensuring social justice (ESRC Global Environmental Change

Programme, 2001). The interface between ecological justice and environmental sustainability principles can, however, complicate the situation. Environmental sustainability (as defined in Chapter 1) issues are most easily resolved with social justice at an intergenerational level whereas environmental justice and sustainability issues are most easily reconciled at an intragenerational level (Dobson, 1998; ESRC Global Environmental Change Programme, 2001). The relationship between environmental justice and sustainability groups has traditionally not been easy, even though there are areas of theoretical, conceptual and practical compatibility between them (Agyeman, 2005; Bulkeley et al., 2005). This friction may be explained by the bottom-up nature of environmental justice groups and the top-down emergence of sustainability, as in the Local Agenda 21 initiatives that emerged from the United Nations Conference on Environment and Development in 1992 (Dryzek, 2005; Roberts, 2003). Environmental justice organisations have, it is argued:

> expanded the dominant traditional environmental discourse, based around environmental stewardship, to include social justice and equity considerations. In doing this, they have redefined the term environment so that the dominant wilderness, greening and natural resource focus now includes urban disinvestment, racism, homes, jobs, neighbourhoods, and communities (Agyeman, 2005: 2).

The tension between political theorists is exemplified in the different approaches seen in resolving issues of environmental and social justice as evidenced in the different approaches of Dobson and Agyeman and Evans. In their research Agyeman and Evans (2006) identify that a broadly focused civic environmentalism is necessary for ecological integrity, civic democracy, social well-being and economic vitality. The elements of this civic environmentalism are described in Table 3-1.

However, Agyeman and Evans see little evidence of this bottom-up community outrage focused on environmental injustice in Europe, with the exception of Scotland where the organisation Friends of the Earth Scotland has adopted the slogan 'No less than a decent environment for all; no more than a fair share of the earth's resources' (Friends of the Earth Scotland, 2007), a call supported by the then Scottish First Minister Jack McConnell (McConnell, 2002). Scandrett (2000) coming from a community development perspective argues that a community in Scotland can have well balanced, sustainable development that is nonetheless at the expense of both other communities

and future generations. He sees the interface between community development and sustainable development largely appearing out of a communitarian perspective which lacks the radicalism of the broadly focused civic environmentalism of the environmental justice movement.

Table 3-1 Broad Focus Civic Environmentalism
(After Agyeman and Evans (2006))

Central Premise	Interdependent nature of environmental, social, political and economic problems. Civic environmentalism stresses quality and sustainability of communities
Central Focus	Focus on connections between environmental, economic and social issues including urban disinvestment, ethnic segregation, unemployment and civic disengagement
Contribution to Sustainable Communities	Helps to protect and enhance the environment, while meeting social needs and promoting economic success i.e. meets the goals of a sustainability community
Nature of Change	Political transformation via paradigm shift
On the Role of the Citizen	Active citizenship with focus on the responsibilities of the citizen to the environment, social, and economic health of the community
Role of Social Capital	Environmental, economic, and social decline mirrors decline of social capital. Increasing social capital and networks of social capital is essential for developing sustainable communities
Stance on Environmental Justice	Environmental injustice is a result of social, economic and ethnic inequality. Focus on procedural and substantive justice

3.6.1. *Distributive justice*

Since the publication of the Brundtland Report (World Commission on Environment and Development (WCED), 1987) the tripartite aims of securing environmental protection, equity in distribution and justice for future generations have been linked together under the term 'sustainability' (Hayward & O'Neill, 1997). This close theoretical relationship between environmental sustainability and social justice is acknowledged by Dobson (1998; 2000; 2003b; 2007; 1999). Dobson (2003b) states that he has come to the 'reluctant conclusion that social justice and environmental

sustainability are not always compatible objectives', despite the political advantages of conjoining the two in a rapprochement between 'red' and 'green' (2003b: 83). He comes to this conclusion on the basis of real-life observations and theoretical considerations which are covered in considerable detail in *Justice and the Environment* (Dobson, 1998).

For Schlosberg (1999) a US Professor of Political Science, this stress is a hallmark of the holistic environmental justice movement which is highly significant in the United States and which has conclusively proved that environmental 'bads' are disproportionately placed in communities of poor people and/or people of colour (Dobson, 2003b). Dobson holds that the objective of the environmental justice movement is to more fairly distribute 'bads' but he questions whether this redistribution will also produce environmental sustainability, because redistribution does not necessarily imply an aggregate reduction of those 'bads'. The key is whether or not environmental sustainability is a key function of environmental justice. Schlosberg (1999) rejects Dobson's focus on distributive justice when critiquing environmental justice, arguing that the movement is threefold, and that its strength is overcoming the dichotomy between the different forms of justice.

3.6.2. Beyond distributive justice

Whilst Dobson concentrates on the distribution of 'goods' and 'bads', both Eckersley and Plumwood assert that privileged social classes have been able to remain spatially, temporarlly and epistemologically 'remote' from the ecological consequences of their decisions in ways that perpetuate environmental injustice and ecological irrationality (Eckersley, 2004; Plumwood, 2002). Eckersley (2004) seeks to locate the demand for social and environmental justice in the broader context of communicative justice, only one subset of communicative justice being distributive justice

This issue of environmental justice is also taken up by Schlosberg who argues that global environmental justice needs to be 'locally grounded, theoretically broad, and plural – encompassing recognition, distribution and participation' (Schlosberg, 2005: 102). In his critique of liberal theories of justice Schlosberg, like Eckersley, concurs

with Young in arguing for a theory of justice that moves beyond the inequitable distribution of social goods to also encompass the conditions undermining social recognition of the communities disadvantaged by the inequitable distribution. As Young states 'distributional issues are crucial to a satisfactory conclusion of justice, [but] it is a mistake to reduce social justice to distribution' (1990: 1). My interest in Schlosberg's work stems from his stress on:

> policy making procedures that encourage active community participation, institutionalise public participation, recognise community knowledge and utilise cross-cultural formats and exchanges to enable the participation of as many diverse groups as exist in a community (Schlosberg, 2005: 106).

In a similar mode to Schlosberg, Fitzpatrick has developed a *post-productivist* concept of ecowelfare based on three principles: an alternative conception of distributive justice, encompassing strong equality and diverse reciprocity; recognition and care as 'attention'; and sustainability (Fitzpatrick, 2003).

3.6.3. *Justice as recognition*

In the environmental justice movement recognition of the communities bearing the brunt of inequitable distribution is crucial to the process of countering that inequitable distribution (Schlosberg, 1999). Part of the problem of injustice is institutionalised domination and oppression and a lack of recognition of group difference, often seen in miscommunication (Schlosberg, 2003; Young, 1990). This is the kind of injustice recognised by new social movements, including 'greens', which focus on responding to various forms of misrecognition in a collective, community rather than an individual sense. This miscommunication is also recognised in the work of Wolsink (2007a; 2007b) discussed below.

3.6.4. *Justice as participation*

The third prong of holistic environmental justice is to demand more public participation in policy development (Schlosberg, 2007). Procedural justice is concerned with the process by which decisions are made, including 'rights of participation, access to information and lack of bias on the part of the decision-maker' (Gross, 2007: 2729). It requires an open, communicative and participatory political

process so that environmental risks will be both more equitably distributed and decreased overall, and recognises the various community and cultural conceptions of environmental health and sustainability (Schlosberg, 1999). There is a significant link between lack of recognition and respect, and a decline in an individuals' membership and participation in the community including in using their right to participate in the democratic process (Schlosberg, 2003). Indeed, Young (1990) argues for democratic decision-making procedures as an element of and condition for social justice.

Returning now to the focus of this research, the preceding discussion of literature on community and social justice highlights the need to incorporate these wider dimensions of justice. If a model of community ownership of wind turbines for New Zealand is going to fulfil environmental justice criteria it will need to incorporate all the forms of justice described above.

3.7. NIMBYism and Community Participation in Decision Making

It is important to understand where networks of opposition to developments such as wind farms come from and why they exist. This understanding has preoccupied a number of theorists and may be characterised as the 'BANANA', 'LULU', 'NOTE'[7] (Wester-Herber, 2004) or most commonly 'NIMBY'[8] debate (Devine-Wright, 2005b; Haggett & Toke, 2006; van der Horst, 2007; Wolsink, 2000; 2007a; 2007b). NIMBY behaviour can be characterised as when, in theory, a principle or development is regarded as beneficial to the majority of the population, but in practice is strongly opposed by local residents (van der Horst, 2007) This behaviour can also be described as the 'social gap'[9] (Bell et al., 2005). Public perception research on wind energy has mostly taken place in developed countries, including the UK and Denmark using opinion polls and case studies, and has revolved around four key questions. These questions can be summarised as:

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[7] *Abbreviations:* BANANA, build absolutely nothing anywhere near anything; LULU, locally unwanted land usage; NOTE, not over there either.
[8] *Abbreviation:* NIMBY, not in my backyard.
[9] The 'social gap' exists between the high public support for wind energy expressed in opinion surveys and the low success rate achieved in planning applications for wind power developments (Bell, Gray, & Haggett, 2005).

- What support exists for wind energy?
- What environmental or physical characteristics are linked to negative perceptions of wind farms?
- Does proximity to wind farms correlate with negative attitudes? and
- Do negative attitudes lessen over time? (Devine-Wright, 2005b: 126)

However, these questions raise two further questions, namely, does NIMBYism explain wind farm opposition and does local involvement in wind farms increase local support? Devine-Wright concludes that public perceptions are actually socially constructed and subject to influences such as the opinion of friends and the place of residence. Wolsink (2000) also questions whether NIMBY behaviour is significant in terms of the failure of wind farm scheme implementation, and instead suggests that institutional factors within the policy domains of physical planning and energy are more important.

From a planning perspective Wolsink (2000: 59) claims that:

> The dominant position of utilities … creates little institutional capacity for successful siting of wind-power facilities … [even though] … siting is recognised as the most important factor in the development of wind energy, those active in the electricity sector tend to view this as merely a `market imperfection' or a `bureaucratic obstacle' . Such a narrow view is hardly conducive to effective planning.

As a result, most projects are planned first and third party acceptance is sought later according to a 'decide-announce-defend model' which in practise 'tends to offend other parties and turns out to be destructive for achieving wind-power capacity' (Wolsink, 2000: 62). This top-down policy style also restricts the operation of smaller players in the wind energy market due to the absence of electricity feed-in tariffs (see Chapter 2) in many countries, as discussed in subsequent chapters.

From an environmental perspective the siting of wind turbines is often problematic as sites with good wind resources are frequently ecologically and aesthetically sensitive. Wolsink's research suggests that, when coming to conclusions about the appropriateness of turbine siting, communities mainly take into account visual intrusion and the applicability and acceptability of turbines to a chosen site. Reductions in carbon emissions as a result of the commissioning of wind turbines are shown to be insignificant considerations. Wolsink also suggests that what is required is that

institutional capital is built-up by the use of collaborative approaches to planning but these will only result from 'reducing the arrogance of utilities, wind power developers, and public bodies' (Wolsink, 2000: 63).

Bell et al. argue that the role of the public in the 'decide-announce-defend model' is to provide criticism not support, with criticism not only being accommodated but actually solicited in public consultation (2005). This can be described as a democratic deficit explanation for the 'social-gap' where the outcome of the permitting process does not reflect the will of the majority (Toke, 2002). Two alternative explanations of the social-gap are also proposed, qualified support and self interest. The self interest explanation is the classic NIMBY explanation which Wolsink regards as existing but of very limited significance.

Wolsink (2000) explains qualified support as when people believe wind energy is a good idea but also believe there are general limits and controls that should be placed on its development, typically in relation to humans, landscape, environment and fauna (Pasqualetti, 1999; Pasqualetti, Gipe, & Righter, 2002). This realist approach particularly focuses on the role of aesthetics in wind farm development (Geuzendam, 1997; Gipe, 2002; Nielsen, 2002; Schwann, 2002). These aesthetic elements include turbine, infrastructure and access road design, explained by Gipe as the need to minimise the conspicuousness of wind turbines as conspicuousness is often associated with intrusiveness. Gipe lists more than thirty pragmatic guidelines for presenting wind energy's 'best face'. These include providing visual uniformity, order in distinct visual units, repair or removal of non-functional turbines, harmonising of ancillary structures, burial of power lines, minimisation of earth moving and control of erosion (Gipe, 2002: 180-209). Whilst emphasising the instrumental and rational aspects of wind farm design, Thayer and Hansen (1988) also incorporate the symbolic when discussing individual judgements of wind farm proposals.

There are a number of potential strategies to overcome the social-gap such as building up trust through participatory decision making to include a move from the 'decide-announce-defend model' to one of 'consult-consider-modify-proceed'. National planning policies also need to allow for peculiarities of place and that energy policy

must be more accommodating of a range of different electricity suppliers (Bell et al., 2005). In terms of NIMBYism the promotion of environmental citizenship (Dobson, 2003a) is clearly important but hard to achieve. If, as Bell et al. (2005) hold, community ownership models have as much to do with local control of siting processes as financial benefits offered by share ownership, and if control rather than money reduces opposition to community wind farms, then corporate developers need to involve locals in planning, development and management. As Wolsink (2007a) asserts, local involvement to represent the local values of site specific landscapes is vital.

3.8. Place-Identity Theory

As indicated earlier with reference to Devine-Wright (2005b) the NIMBY debate may be re-characterised in terms of the environmental psychological concepts of the place specificity of people's identity, or place identity (Twigger-Ross & Uzzell, 1996; Wester-Herber, 2004). It has been suggested that experience of the natural environment consciously or unconsciously regulates an individual's experience of maintaining their sense of self as expressed in four principles of distinctiveness, continuity, self-esteem and self-efficacy. Place-identity theory argues that our lives are socially and ecologically embedded and the continuity of natural systems such as landscape impact on our development and sustenance of a sense of place (Benton, 1993; Smith, 2003). As a result conflicts may arise when groups argue about the meaning or usage of a place, which can lead to the development of social movements to protest against proposed usage of a particular geographical location. In turn place, interest and identity will also impact on the success of government policy (Peel & Lloyd, 2007).

An answer would appear to lie in increasing public participation and trust (van der Horst, 2007; Wester-Herber, 2004). This theme is taken up by Toke (2008) who believes that it is possible to theorise about how threats to place identity may be ameliorated by local ownership. Toke's stance is supported by Devine-Wright (2005b) who is particularly concerned with the value of place-identity theory in explaining negative symbolic, affective and political responses to wind farms as opposed to realist research that focuses on the physical attributes of turbines. His stance is also

supported by Wolsink when he advocates for more bottom-up planning process and consultation.

3.9. Conclusion

As outlined in Chapter 1 the aim of this thesis is to examine some different models of existing community wind turbine ownership in the UK, Denmark and Australia in order to identify an appropriate model for New Zealand. In Chapter 2, I outlined the background to the research question highlighting current patterns of wind generation in New Zealand, noting the prevalence of the corporate model. It was also noted that public concerns about the siting of wind farms, and the scale and pace of development of wind farms is leading to growing resistance to large scale developments.

In order to help answer the research question posed in this thesis, this chapter has reviewed a large body of literature clarifying the distinction between environmentalism and ecologism and placing community ownership and renewable energy generation in the context of holistic environmental justice. The link between appropriate scale, local skill and resource development and renewable energy generation is shown to have been made consistently since the 1970s. Contemporaneously, bodies of literature appeared expressing concerns for the depletion of environmental resources, and the potential contribution of local action to offset atomisation and the effect of dominant social paradigms. Communitarian theory is shown to embody the same tensions as theories of community and these contradictions are also discussed through the lens of holistic environmental justice concerns. The complex interconnection of NIMBYism and place-identity theory is also explored further extending the investigation of issues of community in the context of community ownership.

These interconnections have been explored to inform the discussion of the research presented in Chapter 5 and discussed in Chapter 6.

4. Research Design

The purpose of this research is to identify an appropriate model of community wind turbine ownership for the New Zealand policy and legislative setting. This chapter outlines the research methods adopted and discusses the ethical issues associated with the research.

4.1. Research Methods

In designing this research Berg's (2007) argument for a model that comprises both research-before-theory and theory before research proved very helpful. This model can be represented diagrammatically as follows and depicts a spiralling process where one spirals forward never completely leaving any stage behind (Figure 4-1).

Figure 4.1 The Spiralling Research Approach
(After Berg, 2007)
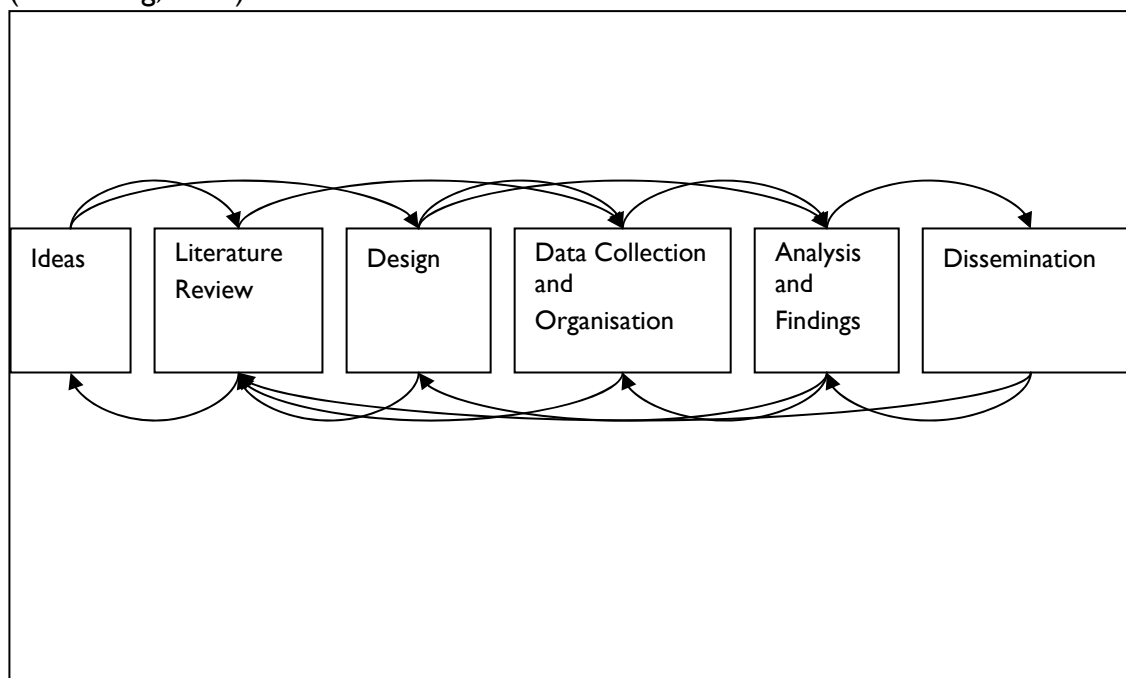
The data collection for this qualitative comparative study was conducted in a number of stages and several forms, reflected in the layout of this chapter. The first stage was a comparative documentary analysis of a number of sources of written documentation or secondary data. The second stage involved comparative analysis of case study

examples of community wind turbine ownership in both the UK and Denmark and an in depth case study of the only permit approved community wind turbine development in Australia. The third stage involved the collection of data applying the knowledge gained from the two previous stages to the contemporary New Zealand situation in order to develop an appropriate model for New Zealand. Following the discussion of these stages, the ethical considerations relating to this research are discussed.

4.1.1. *Comparative research*

Policy in different countries is uniquely shaped by political, cultural, social and economic contexts of different nation states but is also shaped by common elements such as the combination of pressures exerted by those advantaged and disadvantaged by the changing social structure (Ginsberg, 1992: 28). Comparative public policy is a study of the how, why and what of courses of action or inaction pursued by different governments (Heidenheimer, Heclo, & Adam, 1983: 2). This research examines the commonalities and differences in approach to renewable/wind energy policy in three different countries in order to make recommendations about what might be an appropriate course of action for New Zealand.

Lewis (2003) argues that qualitative research design is not a discrete phase that can be concluded early on in the research process, but instead is a process of continual review of approach and decisions. She also suggests that comparative research can be 'a highly effective aspect of qualitative research design and analysis' (2003: 50) because of the necessity to understand and explain rather than just measure and describe difference. In order to explain and measure it is often necessary to embark on a processing stage of data analysis involving editing of notes and transcribing of interviews. As Gray (2004) argues, analysis tends to occur simultaneously with data collection, involving the teasing out of themes and patterns in the data. This process can be visualised in the following diagram adapted from Gray (Figure 4-2).

Figure 4.2 An Interactive Qualitative Data Analysis Model
(Adapted From Gray, 2004)
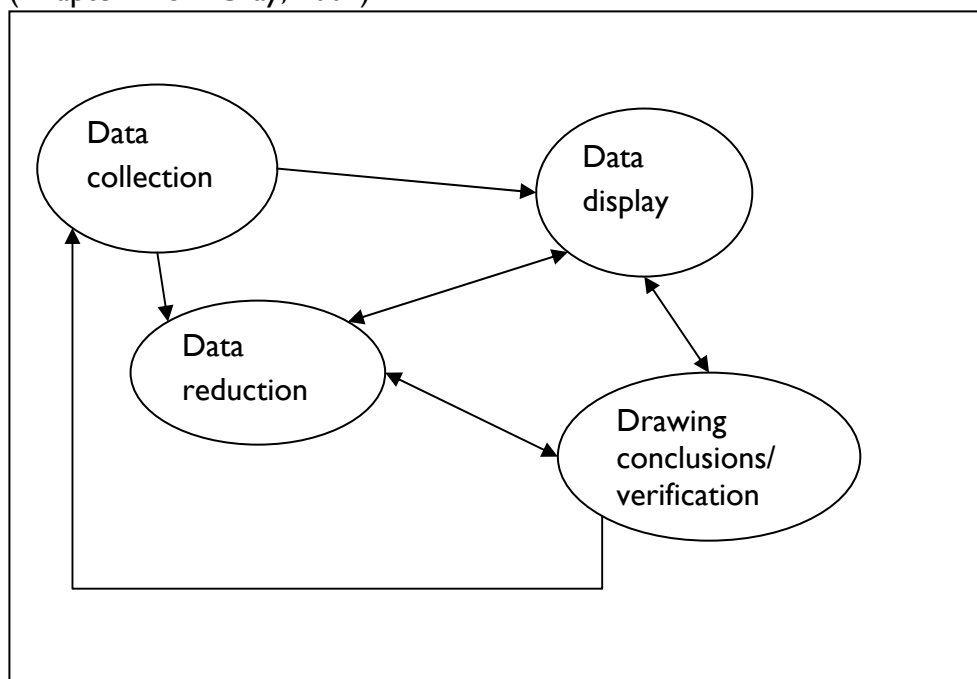
4.1.2. The case studies

In order to collect data for this research I firstly decided to adopt a case study approach because of its distinctive character and relevance to the investigation. As Denscombe (2003) points out, although many of the features associated with a case study, such as semi-structured interviews can be found elsewhere, it is when they are brought together that they form an approach to social research which is distinctive in direction, planning and investigation practices. The most important features of a case study, in the context of this research are: focus on specific instances of community ownership; in-depth study; focus on relationships and processes to understand why outcomes eventuate; and the use of multiple sources. However, what Denscombe also emphasises is that case study research is not a method for collecting data, but instead is a research strategy, whereby, as the researcher, I had to choose some exemplars of community ownership models from a range of choices. As such, case studies allowed me to capture multiple perspectives rooted in specific settings, providing detailed, holistic, and contextualised understanding (Lewis, 2003).

Denscombe (2003) suggests that there are four grounds on which to base the selection of a particular case study: typical instance; extreme instance; test-site for

theory and least likely instance. The case studies chosen are typical of community ownership models as they currently exist in the case study countries. However, the case studies are also unique in that they are atypical of wind turbine ownership as it currently exists in many countries. The countries to be included in the research were selected for several specific reasons. Denmark was selected as a country with a long history of wind based electricity generation and a long established wind turbine construction industry. In 2000 Denmark generated fourteen percent of its electricity demand from wind, the highest percentage in the world, and wind development in Denmark is overwhelmingly community based (Bolinger, 2001: 9). Furthermore although Denmark has a land area significantly smaller than New Zealand the population is similar (Table 4-1).

Table 4-1 Case study comparisons

	Land Area	Land area as % of NZ Land Area	Population	Population as % of NZ Population	Population Density
Australia	7,741,220km²	2881%	21,030,000	503	3/km²
Denmark	43, 094km²	16%	5,451,826	130	129/km²
New Zealand	268,680km²		4,177,000		15/km²
Scotland	78,772km²	29%	5,116,900	122	95/km²
United Kingdom	244,820km²	91%	60,209,500	1,441	243/km²

The UK was selected because like New Zealand it has a very good wind resource but has a low level of installed wind capacity by comparison with other European countries (Bolinger, 2001: 33). Like New Zealand the UK has also encountered neo-liberal and then 'third way' public policies in the past twenty five years with consequential effects on public and social policy priorities. The UK was further sub-divided, and Scotland was chosen because it has a similar size population to Denmark and New Zealand (Table 4-1). Furthermore, like New Zealand, the population is concentrated in several cities, with large areas of relatively sparse, rural population some times experiencing population and economic decline.

Australia was selected for several reasons: as New Zealand's closest neighbour; as a country that is highly reliant on non-renewable electricity generation; and as country with much in common with New Zealand in terms of economic and social history. To date, as in New Zealand, all wind farm developments have been large scale corporate initiatives. However, the first community owned wind farm has been permit approved

in early 2007 in the State of Victoria (Hepburn Renewable Energy Association, 2006, 2007a). Australia has a similar regulatory environment to New Zealand, with a privatised electricity sector.

The same semi-structured interview process was used to collect data in Denmark, Scotland, Australia and New Zealand. The data from Denmark, Scotland and Australia was collected in order to compare with the data collected in New Zealand and to identify an appropriate model of community wind turbine ownership for New Zealand. Whilst each case study country, and each exemplar within each country, is in some respects unique, it is also an example of a broader class of community ownership model. Whether the case study exemplars are generalisable depends on their similarity to other exemplars. In the case of the exemplars from Australia and Scotland, these are examples of community wind initiatives that have progressed further than any other initiative within the same country and as such could be seen as trail-blazers. However, it is still possible to identify significant features of the case study exemplars on which to base comparisons with other exemplars.

4.1.3. Secondary data sources

Secondary data normally take the form of various documents collected for a reason other than the research currently taking place (McNeill & Chapman, 2005). Secondary sources of data are those where no new primary data is collected but new interpretations and/or conclusions are drawn from existing data (Kelsey, 1999). These documents, which can also be referred to as texts, include printed and electronic documents, can be used as sources of evidence about events or actions (Gomm, 2004). Although there are a number of different sources of secondary data, for the purposes of this research the most relevant sources are official reports, laws, political speeches, ministerial records, government, trade organisation and lobby-group websites, newspaper and magazine articles and papers in peer-reviewed journals. May (2001) observes that documents inform us about 'aspirations and intentions of the periods to which they refer and describe places and social relationships at a time when we…were simply not present' (2001: 176).

When evaluating a document Scott (1990) suggests that four factors should be taken into account: the authenticity; credibility; representativeness and meaning. Many of the secondary documents analysed for this research are from peer reviewed academic journals and government reports. Government reports may be regarded as being authoritative, objective and factual, but are also open to the critique that they are 'socially constructed … and reflect the assumptions and interests of particular dominant groups in ways that combine to reinforce the status quo within society' (Henn, Weinstein, & Foard, 2006: 110). However, despite their deficiencies and limitations, such documents still have meaning if used in a critical and informed way (Henn et al., 2006).

4.1.4. Interviews

By contrast, primary data is that which is collected first hand by the researcher by techniques including interviews (McNeill et al., 2005). Interviews can yield rich insights into individual's experiences, opinions, values, aspirations, attitudes and feelings (May, 2001: 120). Of the range of interview types available to the researcher I chose to conduct semi-structured interviews because I needed to be able to approach the research from the 'subject's perspective' (Berg, 2007: 95) and enter into a dialogue with the interviewee in order to seek both elaboration and clarification. Questioning of the interviewees was guided by the interview schedule (see Appendix 3) but the interviewees were allowed to digress and I was able to probe beyond standardized questions for clarification and elaboration (Berg, 2007; May, 2001).

One purpose for collecting and analysing the secondary data sources was to identify key informants in each of the countries being researched for the next stage of the research. The aim was to recruit up to six participants in each of the four countries, including New Zealand. Having identified some key informants in each country a snow-balling process was used to identify more informants. The intention was to cover activists, professionals and academics in fields related to renewable energy, in each case study country. An interview schedule was devised comprising the primary framework for the semi-structured interviews. This was emailed to the interviewees who chose to be interviewed by email. Participants who did not return their

completed interview schedule within two weeks were emailed again. In one case having completed the schedule by email the participant requested a telephone interview. In face-to-face and telephone interviews the schedule was used as a prompt to ensure all the areas for discussion were covered. In most cases the interview flowed easily across the spectrum of interview questions with little need for direct use of the interview schedule.

Obtaining interviews in the different case study countries met with very different levels of success. In New Zealand and Australia it was possible to interview a number of individuals from the categories referred to above. In the UK it was possible to interview academics and activists plus professionals and activists based in Scotland. Denmark, however, was a very different scenario. Potential participants based in Denmark, with one exception, did not respond to requests for interviews. One professional did agree to be interviewed by email but despite prompting did not return the interview schedule. Potential explanations for this lack of success include language and time issues, the possibility that due to the long history of community ownership in Denmark individuals and organisations have been 'over-researched' and that in the current Danish political framework other issues are more pressing. Potential language barriers had been discussed with my thesis supervisors, and discounted as being unlikely to cause problems. One participant, relating her personal experience of interview based research in Denmark, suggested that community ownership is so 'normal' in Denmark that Danes cannot understand why researchers are interested in interviewing them on the subject. As a result of the difficulties with securing interviews with Danish people, I instead interviewed two Americans of whom I became aware through my literature reviews and as a result of snow-balling. One was an academic who had based herself in Denmark for a period to research community consultation processes relating to wind energy developments, and the other was an activist and professional who has a significant international profile for his work on all forms of community renewable energy development and ownership.

Primary data were collected by email, telephone and face-to-face interviewing techniques. The interviews were conducted to collect data not available from secondary sources. The generic interview schedule was adapted as necessary to

reflect the constraints of the different interview techniques, and the knowledge of the different participants (see Appendix 3). The majority of the interviews were expected to be via email, thence the email interview was designed as the primary schedule to be adjusted as necessary to the limitations of the other interview forms. Each interview was scheduled to last for up to ninety minutes.

Email was expected to be the preferred form of interview format because it appeared to be more flexible for the participant, both to fit in with their own time constraints, and to accommodate time difference across continents. For the purposes of this research email eliminated constraints that would have made face-to-face research impractical by making it possible to contact and interview geographically distant participants. Email also makes it possible to overcome issues of difficulty of participation due to disability, financial constraints (for the interviewer and interviewee), and language/communication constraints (particularly when interviewing individuals for whom spoken English is not their preferred form of communication) (Hessler, 2006; Liamputtong, 2006a, 2006b; Mann & Stewart, 2002). When listing the costs and benefits of email interviewing, issues such as sampling and recruitment, expense and time, working with digital data, privacy, and quality of data need to be taken into account (Hessler, 2006; Mann et al., 2002). Telephone interviews have advantages that are similar to those of email based interviews in that geographical distance and financial constraints can be overcome. The main disadvantage, as for email is the lack of visual interaction (Berg, 2007).

The majority of interviews were actually face-to-face or by telephone (Tables 4-2 and 4-3). Whilst it was expected that participants based in Wellington might be willing to make themselves available for face-to–face interviews, I was surprised at how many overseas participants wished to be telephoned rather than interviewed by email. I had come to the opinion as a result of my reading on the subject of research methods that email would be more convenient than telephone interviewing for participants.

Table 4-2 Interviewees

Academic	Professional	Activist		
			DENMARK	
✓			Joyce McLaren Loring	Previously SPRU, University of Sussex
	✓	✓	Paul Gipe	Ontario Sustainable Energy Assoc/ Toronto Renewable Energy Coop
✓			David Toke	University of Birmingham and Community Wind Power Network
			UK	
✓		✓	David Toke	University of Birmingham and Community Wind Power Network
✓			Patrick Devine-Wright	School of Environment and Development, University Of Manchester
		✓	Lorna Andrews	Isle of Gigha Heritage Trust
	✓		Eric Dodd	Highlands and Islands Community Energy Company
			AUSTRALIA	
		✓	Per Bernard	President, Hepburn Renewable Energy Association
	✓		David Shapero	Managing Director, Future Energy Pty
	✓		John Edgoose	Sustainability Victoria
✓			Catherine Gross	Human Ecology Program, School of Resources Environment and Society, ANU
	✓		Adrian Nelson	Alternative Technology Association
			NEW ZEALAND	
	✓	✓	Jeanette Fitzsimons	Co-leader Green Party
	✓		Fraser Clark	Chief Executive, New Zealand Wind Energy Association
	✓		Doug Clover	Principal Environmental Investigator, PCE
	✓		Sheralee MacDonald	Windflow Technologies Ltd
	✓	✓	Ian Shearer	Sustainable Energy Federation
✓			Robyn Phipps	Institute of Technology and Engineering, Massey University

However, participants were willing to very flexible in order to find an appropriate time to be interviewed. Face-to-face and telephone interviews proved to be beneficial in certain respects because the interactive quality of these allowed flexibility in terms of the breadth of coverage of issues raised.

As noted above, the interviews were semi-structured; they began with an open question, allowing the participant to explain their role in community ownership. This proved to be successful as an ice-breaker and most interviews then proceeded with little prompting from me.

Table 4-3 Interview Types

Interview type	Number of interviews
Face-to-face	9
Telephone	6
Email	2
Email + Telephone	1
Total Interviews	18

All non-email interviews were audio-taped, backed-up and transcribed to produce a format as close as possible to the email data for comparative purposes. In addition field notes were made during interviews both as a back-up in case of audio recording failure and as an additional record of context.

A manual thematic analysis of the data collected from both the primary and secondary sources was conducted (McNeill et al, 2005). This initially involved reading and rereading each transcript in order to pick out particular ideas to be unitized or categorised (Denscombe, 2003). In thematic analysis thematic categories are 'induced' from the data, and while general issues that may be of interest are established prior to the analysis, 'the specific nature of the categories and themes to be explored are not predetermined' (Ezzy, 2002: 88). Identified patterns, commonalities and differences became the themes that recurred between the categories. By rereading the transcripts and reflecting on the identified categories I was able to further refine the themes to those used in subsequent chapters.

4.2. Ethical Considerations

Henn et al. (2006) argue that perhaps the most important aspect of research ethics is the placing of the research participants, not the researcher at the centre of the research design when deciding what is appropriate and acceptable conduct. They suggest that this strategy makes a distinction between matters of principle (what is just in terms of the interests of those being researched) and matters of efficiency or expediency for the researcher. To a significant extent, social research ethics focus on issues of consent, privacy, consequentiality, harm, confidentiality and anonymity. In a similar manner Gray (2004) argues that the central ethical issue in interviewing is that participants should not be harmed or damaged by the research. As Kvale (1996) points out:

> An interview inquiry is a moral enterprise: The personal interaction in the interview affects the interviewee, and the knowledge produced by the interview affects our understanding of the human situation (Kvale, 1996: 109).

However, ethical considerations arise at all stages of the interview process from conceptualisation to design, the actual interview, transcription, analysis, verification and reporting.

This research proposal was acknowledged by the Massey University Human Ethics Committee (MUHEC) to be a low risk notification. Informed consent is central to ethically sound research (Gray, 2004; Henn et al., 2006; Ritchie & Lewis, 2003). In order to provide the information required for the participants to give their informed consent to take part in the research an Information Sheet and Consent Form were designed in accordance with the MUHEC requirements (see Appendices 4 and 5).

The Information Sheet was supplied to all interviewees before their interview commenced. Because the first contact with all potential participants was via email it was possible to ensure that all participants received that Information Sheet as an attachment before they made the decision to take part in the research. The Information Sheet clearly states that participation is voluntary and that interview responses will be attributed to the participants in any subsequent written proceedings arising from my research. The Consent Form accompanied the Information Sheet. Whilst it proved to be a simple process to obtained signed consent form from face-to-

face participants it was more difficult to obtain completed consent forms from participants when the interview was conducted by telephone or internet. Several participants requested that their email response agreeing to be interviewed be taken as consent.

The Information Sheet expressly identified my need to attribute interview responses to participants, and therefore neither anonymity nor confidentiality was offered. All the case studies focus on practices and processes occurring in the public arena, and none of the participants objected to their interview responses being attributed to them. However, I recognise that all information can be subject to misuse and no information is entirely devoid of possible harm to other interests (Henn et al., 2006). For instance, publication of research findings may affect the reputation and material circumstances of participants, due to the implications the publication may carry. Many of the participants in this research are experienced researchers in their own fields, with a consequent understanding of research ethics including the principle of informed consent. All participants were made aware that they could withdraw from the research for any reason including if publication of their comments could cause harm to themselves or others. Several participants made it clear at the beginning of the interview that they might decline to answer some questions, but in the event no participants did so.

4.3. Conclusion

This chapter has outlined the research design used in this research, highlighting the significance of using a case study approach, as the technique most likely to enable me to achieve my research aims. I have also discussed recruitment of participants, research methods and ethical considerations. The following chapter presents the research interview data and the data collected from secondary sources.

5. Case Study and New Zealand Data

5.1. Introduction

This chapter presents the data collected from the analysis of secondary sources and from interviews with individuals who have knowledge of community wind power initiatives in the case study countries, Denmark, the UK and Australia plus New Zealand. Each section starts by introducing the participants and the secondary sources of data used. This is followed by contextual information about wind turbine ownership in each country, further developing the information presented in Chapter 2. The responses to the interview questions (see Appendix 3) and the secondary data have been used to develop six themes which draw together the responses into logical groupings for each case study. (These themes are used in a modified version to present the New Zealand data.) The themes are:

- Context
- Familiarity with community ownership
- Advantages and successes of community ownership
- Barriers and drawbacks to community ownership
- Impact of community ownership on public perceptions of wind energy generation. and
- What facilitates community ownership?

The themes all relate to the research question by providing core information about how and why community ownership has developed in the case study countries, and what New Zealand can learn from this accumulated experience. An exemplar of community ownership is provided from each of the countries in the research, and to conclude each section a summary table is provided, drawing out the key legislative and policy parameters in each country.

The section on Denmark relies more heavily on secondary sources because the data is more historical and intended to provide some of the context for subsequent community ownership projects in the other countries studied. The sections on the UK and Australia follow a similar layout although in the case of Australia the Hepburn Renewable Energy Association (HREA) exemplar is reported in greater depth, because

of its proximity and relevance to the New Zealand situation. Finally, whilst not a case study, a smaller section is devoted to New Zealand reporting on the current ownership of wind energy in New Zealand and the opinions of the New Zealand participants on the prevailing form of ownership, and the potential for community ownership.

5.2. Denmark

5.2.1. Introduction

The participants able to report on the history and development of community wind ownership in Denmark were Paul Gipe, Joyce McLaren Loring and David Toke (see Table 4-2 for further details). In addition a range of secondary sources were analysed including: the report *Community Wind Power Ownership Schemes in Europe and their Relevance to the United States* (Bolinger, 2001); the monograph *Danish Wind Energy* (Tranaes, 1996); the peer reviewed journal article *Community Wind Power in Europe and the UK* (Toke, 2005a); the peer reviewed journal article *Wind Power in the UK and Denmark* (Toke, 2002); the monograph *Wind on the Land* (Thayer et al., 1988); the peer reviewed journal article *Wind energy planning in England, Wales and Denmark* (McLaren Loring, 2007); the thesis *Wind Energy in England Wales and Denmark* (McLaren Loring, 2004); the web-page *Samsø: Denmark's Renewable Energy Island* (Gipe, 2006c); the monograph *Community Wind: The Third Way* (Gipe, 2006a); the book *Wind Energy Comes of Age* (Gipe, 1995); the Danish Wind Industry Association commissioned report *50% wind power in Denmark by 2025* (Ea Energy Analyses, 2007); the monograph *Danish Wind Co-ops Can Show Us the Way* (Christianson, 2005); the peer reviewed journal article *Danish and Norwegian Wind Industry* (Buen, 2006) and the web-page *Self-Sufficient Danish Island leads the way in Clean Energy* (Allagui, 2007).

5.2.2. Context

Denmark's history of using wind to generate electricity dates back to 1891 when a teacher, Poul la Cour, with an interest in the aerodynamics of blades and wings built the first experimental wind turbine which continued to generate electricity for the town of Askov until 1958 (McLaren Loring, 2004; Tranaes, 1996). Subsequent crises,

such as the world wars, led to advances in wind electricity generation until coal and oil began to be imported in significant quantities when interest in electricity produced by wind turbines almost disappeared. The 1973 oil crisis changed this. Tranaes writes:

> Some proposed wind power. It was 'hopeless', some said. 'It had already been tried and was completely insufficient – it was unreliable, the wind was not blowing all the time. Now nuclear power was the solution, the final solution to the energy problem and our dependence on foreign countries.' But as often happens, some individuals did not allow suppression of public opinion (Tranaes, 1996: 2).

The momentum of the anti-nuclear movement gradually grew through the 1970s and 1980s, and in 1985, the year before Chernobyl, the Danish Parliament (the Folketing) made the decision to not build nuclear reactors (Christianson, 2005). This decision was reportedly, at least in part, due to the relatively large number of women MPs, 'who created a coalition against nuclear energy and cooperated across parties to support legislation supportive of renewable energy' (Christianson, 2005: 2). In 1979 the Social Democratic government had 'enacted a renewable energy program that included a capital investment subsidy of thirty percent of total project costs' (Bolinger, 2001: 11). This subsidy recognised that the first modern turbines erected had been built by private individuals with no government support. The subsidy sought to compensate local communities for the positive externalities of wind generation which tend to accrue at the national rather than the local level. When the subsidy was withdrawn in 1989, 2567 wind turbines had received investment subsidies (Bolinger, 2001; Christianson, 2005). Christianson asserts that 'most of Denmark's wind farms were erected by local co-operatives and individual farmers' (Christianson, 2005: 2).

Whilst it is apparent that since the election of a right wing government the focus of Danish wind energy policy has changed, there is still an emphasis on independence from fossil fuels as illustrated in the following statement from the report *50% wind power in Denmark by 2025:*

> On 19 January 2007, the Danish government published a visionary Danish energy policy outlining energy policy objectives towards 2025. The energy policy proposals are part of the Danish government's long-term objective of making Denmark independent of fossil fuels and include doubling the share of renewable energy to thirty percent by 2025. The government highlights the importance of concurrently developing and commercialising Danish core strengths within amongst others large and highly efficient wind turbines (Ea Energy Analyses, 2007: 3).

This analysis is significant in that it illustrates the history of wind energy development and ownership in Denmark, in that it reflects upon both the early history and the recent attempts by Danish governments to change the path of wind energy.

5.2.3. Familiarity with community ownership

David Toke is a Senior Lecturer in Environmental Policy in the Department of Sociology at the University of Birmingham in the UK with 'twenty years interest in community ownership inspired by a visit to the Netherlands ... [who] tried to get a [community ownership] scheme going in Birmingham and earlier in mid-Wales' (Toke Interview, 2007). Joyce McLaren Loring is also an academic who was based in the UK when she completed her PhD on wind energy in England, Wales and Denmark focusing on community participation in project acceptance. She chose to use Denmark as one of her case studies because of 'history, good contrast, and because as politics has changed it became a comparison with the UK because the country has become more conservative' (McLaren Loring Interview, 2007). Paul Gipe is a community ownership activist based in California who has written a number of books on renewable energy, with a particular focus on community ownership.

5.2.4. Advantages and successes of community ownership

Danish co-operatives started in 1866, and the first co-operative dairy was opened in 1882 in West Jutland (Tranaes, 1996). The Danish model of the co-operative stems largely from the work of the philosopher Grundtvig who advocated for interactive and culturally relevant learning through living. This philosophy was the mainstay of the Danish Folk High Schools, and Poul la Cour (referred to above) was a Folk High School teacher who was pivotal to the advent of decentralised, localised electricity generation in Denmark. In 1956 an ex-student of la Cour's built the 200kW 'Gedser Turbine' which operated until 1967 (Gipe, 1995; McLaren Loring, 2004; Tranaes, 1996).

Both Danish agricultural and wind turbine co-operatives have had a major effect on the development of the Danish economy (Gipe, 1995). Wind turbine owners formed the

Danish Wind Turbines Owners' Association (DWTOA) in 1978 and problems with early turbines led to them demanding minimum design standards. The level of membership makes the Association an effective voice for lobbying government, and it also works in alliance with the wind turbine manufacturers' trade association. Flemming Tranaes, a former chair of the DWTOA suggests, 'if you are going to solve big problems, it is necessary to join your hands – all for one, and one for all' with voting taking place according to heads, not according to livestock or other property, in other words the co-operative model (cited in Tranaes, 1996: 4).

The 1970s oil crisis saw a downturn in Danish farm equipment manufacture. Like New Zealand the Danish economy has been dominated by primary production, and primary production and the wider European economy had supported this equipment manufacture. Surplus capacity in this market was ideally placed to take up the manufacture of wind turbines (Gipe, 1995). Because manufacturers were located close to their installed turbines they were able to easily service and maintain them and as a result knowledge within the industry grew quickly (Gipe Interview, 2007; Gipe, 1995; McLaren Loring, 2004).

In the context of the United States Gipe (Gipe Interview, 2007) believes that the upper mid-west states of Minnesota and Wisconsin have been successful in implementing 250MW of community wind power in limited partnerships mainly in the hands of farmers, because of Scandinavian and German ancestry. Because of this influence they know community wind power can be achieved and they are therefore more demanding of their politicians, believing that they have as much right to develop wind energy as the corporates: 'Why should I just lease my land to a commercial wind developer when I can do it myself and make more money?' (Gipe Interview, 2007). Although he is reluctant to admit it, Gipe believes that the 'reality is that there are culture differences … and they do have a very big influence' (Gipe Interview, 2007). Similarly 'wind energy development in Denmark is really part of a continuum with the theology of *grundvie* and the idea that all people have a right to knowledge … and as such to own their own means for livelihood' (Gipe Interview, 2007). Even people with Danish and German heritage living in other countries have connections to Denmark and

Germany so they share a cultural knowledge that community wind power can be achieved.

The commitment to remaining nuclear free has been highly significant in Danish energy policy decisions. Toke maintains that the relative lack of development of community ownership in the UK as compared with Denmark and other European countries is because:

> in these countries there has been a stronger anti-nuclear movement which I think has contributed to people having stronger motivations … it's just the difference in the way that the anti-nuclear movements in particular developed (Toke Interview, 2007).

Gipe also regards the 'people's movement against nuclear power, but also at the same time for … wind energy (because the Danes have an historical association with wind energy)' as being crucial to the development of community wind ownership in Denmark (Gipe Interview, 2007). Gipe, although mainly based in California and Ontario, has studied community ownership of renewable energy on a global basis. He concludes:

> There is less NIMBYism, less social friction, if the community has an ownership stake in a project. Even so there are people who are opposed to this technology because it is wind energy … it doesn't make any difference to them who the owner is …typically they love nuclear power … there are opponents of community power within the wind industry … because every megawatt that goes to a community project is a megawatt they have not built (Gipe Interview, 2007)

For legal reasons wind co-operatives are partnerships which function as co-operatives. Partnerships are not, however, taxable entities, and as such individuals are taxed individually and proportionately (Bolinger, 2001; Tranaes, 1996). Danish electricity law requires that wind turbines are directly owned by electricity consumers, so a partnership which is a contractual relationship between several electricity consumers to pool certain resources in order to run a business is the only form of ownership to qualify (Bolinger, 2001). Wind partnerships pool their savings to invest in turbines, and then sell the electricity generated wholesale to the local grid at rates that were historically attractive. In addition, the partnership receives a full refund of carbon dioxide tax and a partial refund of energy tax.

Shares in wind turbine ownership are commonly 1000kWh/year, which is often within the means of personal savings. Furthermore, banks in Denmark will make long-term loans for up to seventy percent of the value of an applicant's real estate, rather than relying on the viability of the project for which the loan is required. There are also 'ethical banks' in Denmark which will make loans to wind turbine projects at below-market rates.

Wind turbine owners and electricity distributors share the cost of connecting turbines to the grid. For the owners, this has the advantage of allowing upfront knowledge of costs and processes. Owners are responsible for the costs of connecting to the nearest technically suitable connection on the grid but the distributor is responsible for any grid reinforcement required or for additional costs if they require interconnection at a more distant location on the grid (Bolinger, 2001).

5.2.5. Barriers to and drawbacks of community ownership

Over time the Danish government has relaxed ownership rules, which previously ensured that those bearing the local costs of wind power gained the benefits of the government subsidies. In the 1980s only those living within three kilometres could invest in a wind partnership, in 1985 this extended to ten kilometres, in 1992 to those living in neighbouring boroughs, in 1996 to those owning property or working in a borough, in 1999 to all of Denmark, and finally in 2000, to the whole European Union (Bolinger, 2001).

5.2.6. Impact of community ownership on public perceptions of wind energy generation

McLaren Loring believes that for the Danes community ownership is not:

> a big deal because to them they [the turbines] are second nature … [there is] very little red tape … involved in putting up a turbine, just a case of going to the bank and borrowing money (McLaren Loring Interview, 2007).

This belief is backed up by Gipe when he makes the assertions noted above regarding the Scandinavian belief that community ownership is always a possibility, and that wind generation is the norm (Gipe interview, 2007).

5.2.7. What facilitates community ownership?

To compensate for the relaxation in ownership regulations, government has imposed stricter planning controls on the siting of turbines to try and concentrate them in areas with greater wind resources. The Danish government has also tried to incentivise the replacement of older, smaller output turbines with modern larger output turbines.

In 1999 the Danish government decided to abandon its feed-in laws where local utilities had been required to purchase wind energy from independent generators (the co-operatives) at eighty five percent of the generators production and distribution costs. These feed-in laws guaranteed the minimum price for electricity generated from renewable generation (Meyer & Koefoed, 2003). Instead the government chose a renewable portfolio standard (RPS) with a system of tradable green certificates (TGCs) with a transitional process. The refund of carbon dioxide tax was also to be progressively removed as the TGC was implemented (Bolinger, 2001)

5.2.8. Exemplar – Samsø: A renewable energy island

The 4,300 residents of Samsø, a 112 square kilometre island off the east coast of Jutland, won a 1997 Danish government competition to become entirely reliant on renewable energy, and within ten years they have achieved this aim. In order to do this, eighty percent of the capital required was raised from local investors within the framework of existing Danish laws and regulations (Gipe, 2006c).

Traditionally the economy of Samsø was dominated by fishing, but fishing has been in serious decline threatening the survival of the island. Now, residents are highly reliant on income from the fifty thousand summer visitors to the island (Gipe, 2006c).

A combination of different forms of renewable energy generation have been installed on the island including wind turbines, combined heat and power biogas plants, and solar systems, with the wind turbines generating the majority of the electricity consumed. The fifteen 750kW land-based wind turbines are all owned individually by local farmers, and two of the ten 2.3MW offshore turbines are owned co-operatively

by four hundred and fifty shareholders (Gipe, 2006c). The offshore turbines mitigate one hundred and forty percent of the emissions from transport on the island by selling electricity to the rest of Denmark, allowing the island to be carbon-neutral (Allagui, 2007).

5.2.9. Conclusion

The key features of the Danish case study are summarised in the following table (Table 5-1). Denmark has an established form of community ownership of wind energy from which other countries have taken inspiration. However, policy changes made in response to political change and EU directives have meant that community wind ownership has stalled in the early years of the twenty first century.

Table 5-1 Danish Case Study Key Features

	Status as of October 2007
Existing wind energy ownership models	Large number of community schemes. Corporate ownership growing.
Financing model, policy structure and tariffs	Shares affordable and loans easily available. Was feed-in tariffs, now renewable portfolio standard with green certificates.
Planning framework	Siting controls becoming stricter, replacement of older turbines with larger modern turbines being incentivised.
History of community ownership or co-operatives	Long history in both agricultural and wind energy projects.
Current examples of community wind energy ownership	Many
Commercial scale wind turbine manufacturing	Significant
Nuclear energy perspective	Nuclear energy generation rejected.

5.3. United Kingdom

5.3.1. Introduction

This section presents data on community wind turbine ownership in Scotland, one of the countries comprising the United Kingdom. The reasons for deciding to concentrate on Scotland have been explained in Chapter 4.

The participants interviewed for the UK case study were Lorna Andrews, Eric Dodd, Patrick Devine-Wright, Joyce McLaren Loring and David Toke (see Table 4-2 for further details). A number of secondary sources were investigated including the report for the Renewables Advisory Board and the Department of Trade and Industry *Community Benefits from Wind Power* (Centre for Sustainable Management with Garrad Hassan, 2005), the project report for the Sustainable Technologies Programme of the Economic and Social Research Council *Harnessing Community Energies* (Economic and Social Research Council, 2006), the thesis *Wind Energy in England, Wales and Denmark* (McLaren Loring, 2004)*,* and the peer reviewed journal articles *Wind Power in the UK* (Toke, 2003) and *Harnessing Community Energies: Explaining and Evaluating Community Based Localism in Renewable Energy Policy in the UK* (Walker et al., 2007).

5.3.2. Context

The Highlands & Islands Community Energy Company (HICEC), managed by Eric Dodd, was previously part of Highlands and Islands Enterprise (HIE), which is one of two economic development agencies operating in Scotland, the other being Scottish Enterprise. HIE is distinctive in that its remit includes community as well as business and skills development (Dodd Interview, 2007). There are many 'social enterprise organisations in Scotland – companies limited by guarantee, their profits not being for distribution' (Dodd Interview, 2007). There is a significant amount of funding available for such ventures from 'Scottish, United Kingdom and European sources' (Dodd Interview, 2007). However, this funding is always available as match funding meaning that projects needing to secure funding must find the other fifty percent of the project finance from other sources, which can be a major problem (Dodd Interview, 2007). Dodd points out that many island and remote rural communities are not sustainable due to 'depopulation and lack of opportunity' (Dodd Interview, 2007), exacerbated by Scotland's history of wealthy absentee landlords. Legislation is now in place allowing communities to buy their own land for collective profit. If rural land comes up for sale 'a community can indicate its interest in purchasing it and the sale can be stopped until the community can raise the purchase price' (Dodd Interview, 2007). This legislation and renewable energy legislation is the responsibility of the Scottish executive (Dodd Interview, 2007).

5.3.3. *Familiarity with community ownership*

The participants specific to this case study other than those described in the previous case study are Lorna Andrews, Eric Dodd and Patrick Devine-Wright. Andrews has been involved with community ownership for five years and is the:

> Company Secretary of Gigha Renewable Energy which was the trading subsidiary company set up by Isle of Gigha Heritage Trust to oversee the Turbine Project. I am employed as project assistant by the Isle of Gigha Heritage Trust and am responsible for the financial administration, maintenance and monitoring of the wind farm (Andrews Interview, 2007).

Dodd has been with HICEC/HIE for five years, his career has been in the electricity industry including working in New Zealand for Genesis Energy. Devine-Wright is a chartered environmental psychologist in the School of Environment and Development, University of Manchester in the UK, with specific interest in place, community, NIMBYism and renewable energy.

5.3.4. *Advantages and successes of community ownership*

The United Kingdom operates a form of Renewable Portfolio Standard (RPS) known as the Renewable Obligation (RO) which mandates that by 2010 electricity retailers supply ten percent of their electricity from renewable sources. As a result a renewable generator has two income streams, the price paid for the electricity and a supplement, the Renewables Obligation Certificate (ROC). If the retailer does not meet this obligation they are required to pay a fine at a rate above three pence per kilowatt hour and this process has set the value of ROCs. As of July 2007 a renewable generator can therefore earn between seven and eight pence per kilowatt hour, which at a good wind site close to a grid connection means that it is possible to generate a good profit from one turbine (Dodd Interview, 2007; Toke Interview, 2007).

According to Andrews the most important factors in the success of the GREL project are 'having the community on side' and having expert technical advisors with the ability to progress and explain the project 'in layman terms'. She went on to say that:

> I think that the general public are much more tolerant of community owned wind farms because of what they represent for the community. On Gigha the whole community was in favour of the wind farm. One farmer at the meeting stated that he hated wind turbines, thought them ugly, however, he would vote in favour of the project as he realised that the community needed to find ways

of generating an income which it could put into regenerating other areas of the island (Andrews Interview, 2007).

5.3.5. Barriers to and drawbacks of community ownership

McLaren Loring, an academic who was awarded her PhD by the University of Sussex, is particularly interested in the influence of 'critical actors' on the success or failure of initiatives having a high degree of community involvement. In her study of community wind initiatives in England and Wales, with particular relevance to North East England, she has identified the barrier of opposition groups that:

> never said they were tied to the nuclear lobby but when you looked into the connections of the people involved in them, they were, obviously. If there was a leader … a critical actor … who had connections to either government or the nuclear lobby … that made all the difference in the world. If this person already had a name in the community … it really was bad news for the wind turbine if this person turned against you (McLaren Loring Interview, 2007).

Dodd reports that another barrier is that many of the large scale manufacturers are so busy developing and building large turbines that they are not interested in supplying turbines of less than one megawatt. All the Scottish projects are in 'challenging locations to get turbines in and erected, so turbine manufacturers want assurances of [quality logistical] organisation' (Dodd Interview, 2007). Also load capacities are usually in excess of forty percent and wind conditions are Class IA[10] 'which makes manufacturers nervous [and] the warranty won't be as good because of this' (Dodd Interview, 2007). This has a number of ramifications for community projects. HICEC are trying to form consortia for facilitating the ordering of turbines for a number of projects at once to overcome these problems and are 'trying to get a well respected constructor as part of the consortium to build projects from planning permission' (Dodd Interview, 2007). HICEC has 'an aspirational goal' of seeing large turbine assembly occurring in Scotland (Dodd Interview, 2007).

New rather than second-hand machines are being purchased for the security of the projects and because of the wind conditions. The weakness of the electricity infrastructure in the Highlands and Islands means that only one or two megawatt

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[10] An international standard of performance, manufacturing and quality control, for the most difficult wind conditions.

installations can be connected to the system 'its like trying to put a turbine on the end of a bit of string!' (Dodd Interview, 2007).

5.3.6. *Impact of community ownership on public perceptions of wind energy generation*

In the UK context Devine-Wright argues that landscape values and the visual impact of turbines, 'is something that is always trotted out' (2007) in opposition to wind energy developments. In the UK he believes that this has led to 'almost a kind of timid planning approach … the less people can notice them [the turbines] the better' (2007). In turn he suggests that this has led to recognition in the UK that planning needs to take the cumulative impact of wind farms into account. However, at the same time the UK government enthusiasm for offshore wind has grown as offshore wind is seen to be less constrained by planning processes.

In Scotland wind farms of up to fifty megawatts go into the local authority planning system whilst larger proposals require national approval. To date 'there has not been much adverse reaction to potential projects because communities want them' (Dodd Interview, 2007).

Andrews thinks that the planning department is likely to have a more favourable attitude to the siting of a community owned wind farm than a corporate wind farm: 'Community owned wind farms are likely to be smaller projects and therefore less intrusive' (Andrews Interview, 2007).

5.3.7. *What facilitates community ownership?*

Devine-Wright argues that community renewable energy is a:

> project with a high degree of participatory involvement of local people … [with the] positive outcomes staying in the community, and shared around the community as much as possible … [but that it] can mean whatever you want it to mean. (Devine-Wright Interview, 2007).

In his research in the UK he found that, at one extreme, some communities thought that community renewable energy should be 'part of a grass root general social movement … towards behavioural change, societal change [and] greener values'. At

the other extreme policy makers tend not to use definitions, or use legalistic definitions, depending on the various rules pertaining to obtaining funding. This lack of definition appears to reflect an:

> almost accidental mix of different motivations [for government interest in community renewable energy]. It was a sudden chiming of interest in climate change, interest in decentralised energy, the need to move towards more renewable energy and a low carbon economy as well as at the same time you've got sustainable development policy coming through with its emphasis upon Local Agenda 21, the awareness of good practice in other countries particularly in Denmark and many people raising questions about why such approaches could not be seen to work in the UK. So there were a whole number of different drivers we identified which were seeming to make community renewable energy a hot topic in the last five years in the UK. We found that people were approaching it from very different directions … and so we came to the conclusion that this wasn't evidence that there was some kind of major policy shift towards a very radically different energy technology system which was far more kind of closer to communities and closer to people. Rather than that being the case we found that it was more of an accidental meeting of people with very different values and aspirations and ideas about community renewable energy, but because the word is so vague it meant that they were able to cohabit a shared kind of space … which meant that people were able to work together … but maybe mean very different things in practice (Devine-Wright Interview, 2007).

In order to help conceptualise community ownership, Devine-Wright has developed in conjunction with fellow researchers, a graphical heuristic to illustrate a way of understanding the level of community participation present in a community energy initiative (Figure 5-1). In the UK context community renewable energy projects range from top right hand quadrant towards both the top left hand quadrant or the bottom right hand quadrant.

Devine-Wright makes the valid point that developing a community ownership scheme is:

> way beyond what can be reasonably expected of what individuals can take on in the evenings … there is significant gains to be made from getting communities involved in smaller scale projects like a single turbine on a community facility like on the grounds of a local school … or village hall and connecting that up to a community facility … or local homes (Devine-Wright Interview, 2007).

Figure 5.1 Levels of Community Ownership Management
(Adapted from Devine-Wright et al. (2007))
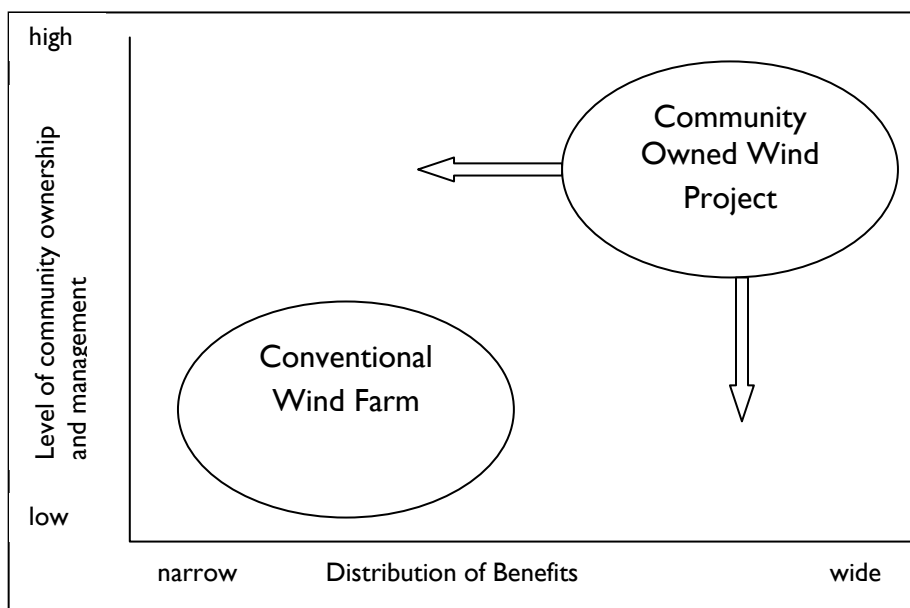
He suggests that one option is to partner private sector companies in larger scale developments. However, this option is rejected by Dodd who sees this as being unlikely to be acceptable to the company and of little gain to the community, as it is:

> hard to make neat and tidy because all they [the community] own is a bit of paper with no rights apart from a profit share and a big developer doesn't want extra legalities when they sell on or redevelop (Dodd Interview, 2007).

Instead the support framework as supplied to Gigha by the Highlands and Island Community Energy Company is seen to be crucial (Andrews Interview, 2007).

Devine-Wright comments that:

> Scotland seems to be quite far ahead of England and Wales particularly in valuing community level projects and community level initiatives. I think the reason for that is they have a real and pressing urgent issue around the vitality of communities and resilience of communities in the highlands and islands region. They have a number of small island communities whose future is very much in doubt and so these people, at the central policy [level] in Edinburgh can see renewable energy as a potential lifeline, providing an income stream to local people. They have taken on the mantle of community renewable energy in a way that perhaps there hasn't been the same economic rationale for in England and maybe Wales as well … I do think there is something special going on in Scotland. In Scotland they are continuing to fund advice and support to communities wanting to develop renewable energy in a way that they seem to have pulled the plug on in England and probably never was existing in Wales.

[There are only] isolated pockets of heroic individuals' in England and Wales (Devine-Wright Interview, 2007).

Devine-Wright reports that the:

problem is that electricity is a very complexly regulated energy sector in the UK and it hasn't quite been made easy yet for small scale electricity generation projects to get up and running… despite all the rhetoric' (Devine-Wright Interview, 2007).

Furthermore because of the divergent responsibilities of government departments:

The people who drive energy [policy] at central government level are people who are based within the Department of Trade and Industry. These are not people who are thinking in terms of communities because communities are the responsibility of … the Department of Communities and Local Government (Devine-Wright Interview, 2007).

Devine-Wright believes that there have been four or five years of interest in community renewable energy by government in the UK, but that the interest is now dissipating. As evidence for this conclusion he sites the demise of the Community Renewables Initiative. He believes this was:

Evidence of … brief flirtation with the meso level as a way of developing renewable technologies but the whole market led ideology… of large scale private utilities … means that the meso level is just dropping off the agenda … and instead … the energy policy is more focussing on … micro generation and that … is increasingly being seen as something which is at the household or the personal level rather than at the community level (Devine-Wright Interview, 2007).

Corporate electricity generators:

have grabbed a lot of the grid capacity. It costs £5000 for a grid connection study, the results of which provide a cost quotation for a connection and an indication of how long it will be before a connection can be organised. If local connections are full the generator will have to wait for an upgrade. Embedding the project generation in the local distribution network makes it easier to get a connection than trying to connect to the main transmission network. There is no financial support for grid connection and there is always a queue to get it done (Dodd Interview, 2007).

Dodd asserts that there has been a tendency for generators to apply for and establish themselves in the connection queue before obtaining planning permission which creates hold-ups for others waiting for connections. There are moves to stop this practice.

HICEC does not 'encourage communities to supply themselves with their own generation because communities would then have to chase any debt accrued by their customers and this could erode profits' (Dodd Interview, 2007). In this situation the community also needs to arrange additional buy back and supply agreements to cover themselves when their supply does not match their demand. This problem is 'not so bad if … [the community scheme] is directly coupled to a local load such as supplying a fish factory but then they have the expense of putting in the big cable' (Dodd Interview, 2007).

5.3.8. Exemplar - The Island of Gigha

Gigha Renewable Energy Limited (GREL) is a trading subsidiary of the Isle of Gigha Heritage Trust, and was established as the 'UK's first grid-connected local community-owned wind farm in December 2004' (Highlands and Islands Community Energy Company). The Isle of Gigha is the most southerly of the Scottish Hebridean Islands situated three miles west of the Kintyre peninsular and three hours drive from Glasgow.

The wind farm consists of three pre-commissioned Vestas V27 225 kW turbines, with an estimated annual output of 2100MWh per annum. The turbines are known locally as the 'The Dancing Ladies', and together they more than meet all the island's energy needs and generate an annual net income to the community of around £80,000. As Lorna Andrews points out, the wind farm has:

> not only benefited the Gigha community [by] providing income but also benefited other communities in Scotland by setting much of the groundwork and providing a financial model which could be replicated' (Andrews Interview, 2007).

The turbines were sourced from a small wind farm in England that was re-powering with larger models.

> The fact that these were second hand made the capital project affordable. Many other communities are now facing difficulty sourcing second-hand turbines and Vestas, the main manufacturer are refusing to take orders for a single turbine (Andrews Interview, 2007).

Andrews states the impetus for community ownership was:

> the need to look at ways for [the] community to become financially self
> sustainable and generate income [and that the fact that] the GREL parent
> company already owned the land on which the wind farm was sited was hugely
> beneficial. Other communities who do not own the land may face difficulty
> negotiating site and rent with [a] landowner (Andrews Interview, 2007).

Andrews (2007) also suggests that the model of community ownership adopted by
Gigha is preferable to a community benefit model (rejected by the HICEC) because the
community benefit is only a 'small percentage of the [corporates] profits'.

Dodd is concerned with how a community can secure the funding to purchase land
and then generate an income to make the community sustainable. Generating
electricity from community owned wind turbines or micro-hydro installations can
become the required 'cash cow' and this is the model that HICEC are working with.
As of July 2007, 'one project has been achieved, four more are in development and
there are another twenty four projects waiting' in the first five's slip-stream (Dodd
Interview, 2007).

The HICEC model:

> assists communities to develop that first [community owned electricity
> generation] project. The model assists the communities to develop that first
> project. Income is guaranteed by power purchase agreements so banks will
> loan debt finance because they are simple projects once running, just selling a
> product to the market and you can get insurances, so if it does break down the
> banks get their money. The system has been in place for a number of years so
> banks have confidence in it (Dodd Interview, 2007).

HICEC 'initially looked at a community benefit model of ownership, where a developer
moves in and develops a renewable energy scheme and then gives community a part of
it' (Dodd Interview, 2007). Income is generated on a per megawatt basis and the
community decides what to do with it. However, although this was possible it was
hard to make it 'tidy and neat' because 'all the community owned was a bit of paper
with no rights apart from a profit share' (Dodd Interview, 2007).

HICEC will not give a community money to buy a wind turbine, but they will provide
money to help a project get off the ground and later take an investment stake in that
project. This raises the question of how a community that owns little can raise the
money to buy a turbine because even 'if a community owns land they cannot raise

money against it because it is owned in trust and if the project goes wrong they will lose their land again' (Dodd Interview, 2007). Using the model developed by HICEC, a community does all the work to gain the required building consent and manage the project and HICEC grants the funding to employ expert consultants to assist this process. The community has to 'democratically decide what they want and to make decisions about taking the project forward' (Dodd Interview, 2007). The expertise needed is readily available in Scotland and some groups develop enough expertise to then share or sell on their expertise to subsequent projects (Dodd Interview, 2007).

Initially, an elected body 'like a community council engages with the people but they need to form a company limited by guarantee or a co-operative', although HICEC prefers the company model (Dodd Interview, 2007). It requires a robust business plan and that a trust fund is set up so that the income from the project benefits the whole community. Experience shows that communities 'work hard to make sure that income from projects is wisely invested' (Dodd Interview, 2007). The value of a site, and thus a community's equity, increases dramatically when it has planning permission and grid connection ability: 'they build up an equity share so they can start taking ownership of something because they have got something' (Dodd Interview, 2007). HICEC then takes an investment in preference shares so that a community can then raise debt from a bank for the rest of their project. When the community makes enough profit from the sale of the electricity and ROCs they can buy out HICEC's shares. Once they have repaid the majority of the debt they can refinance themselves to do more projects, and in the meantime the community has acquired new business skills. HICEC's redeemed preference shares then become a revolving fund to invest in subsequent projects (Dodd Interview, 2007).

The financial model for GREL is a three way mix of grant funding, loan finance and equity finance (see Table 5.2). The loan is at commercial rates and the equity held by HIE comprises shares on which a six percent dividend is paid. 'The loan will be repaid over a five year period at a fixed rate of interest, with the equity currently held by HIE bought back by the Isle of Gigha Heritage Trust in year five. Furthermore, over the first eight years of the project, a capital reinvestment fund of approximately £160,000 will be built up to replace the wind turbines [which have a projected residual life of eight years]' (Isle of Gigha Heritage Trust, 2004).

Table 5-2 GREL Funding Sources

GRANT FUNDING	
Fresh Futures, Sustainable Communities Project Fund (National Lottery funding administered by Forward Scotland)	£50,000
Scottish Community and Householder Renewables Initiative (Scottish Executive funding administered by Highlands and Islands Enterprise)	£82,000
COMMERCIAL LOAN FINANCE	
Social Investment Scotland	£148,000
EQUITY FINANCE	
Highlands and Islands Enterprise	£80,000
Isle of Gigha Heritage Trust	£40,000

GREL estimated an annual gross income from electricity sales at £150,000. After deduction of running costs such as maintenance, rates and insurance, the creation of a capital sinking fund, and loan repayments and equity re-purchase, the net profit for each of the first eight years is expected to be £75,000. The Gigha community are investing the profit in new housing and the repair of the existing housing stock, incorporating renewables and energy efficiency initiatives (Dodd Interview, 2007).

Dodd states that the Gigha community has grown dramatically partly as a result of the ferry timetable being altered to allow people to commute on and off the island for work and school: 'Bad landowners took money away from the island but now money is coming back in for the wider benefit of the community' (Dodd Interview, 2007).

5.3.9. Conclusion

The key features of the UK case study are summarised above (Table 5-3). Whilst community ownership is struggling to gain ground in England and Wales, the situation in Scotland, for a variety of factors seems to be more hopeful. The support mechanisms have successfully facilitated the first community owned turbines and more schemes are in the pipeline.

Table 5-3 Scottish Case Study Key Features

	Status as of October 2007
Existing wind energy ownership models	Mainly corporate. Some community ownership.
Financing model, policy structure and tariffs	UK policy interest in community ownership declining but Scottish interest is being maintained. Funding available in Scotland but match funding required. Renewable portfolio standard with Renewable obligation certificates.
Planning framework	< 50MW local authority planning process. > 50MW national approval required.
History of community ownership or Co-operatives	Long history of co-operative retailing and banking.
Current examples of community wind energy ownership	Yes small number of projects in England, Scotland and Wales.
Commercial scale wind turbine manufacturing	Manufacture based on domestic scale, some assembly of larger units.
Nuclear energy perspective	Long history of nuclear energy generation. History of anti-nuclear activism on a smaller scale than in some European countries.

5.4. Australia

5.4.1. Introduction

Australia is at a key juncture, in that Victoria is the location of the first approved community owned wind farm in the whole country. Because of the significance of this project to the potential development of community ownership models in both Australia and New Zealand the HREA exemplar takes up a larger proportion of this section than the exemplars have in other sections. The majority of the participants were selected for their knowledge of this specific project and the secondary sources examined are extensive for the same reasons. The participants are Per Bernard, David Shapero, John Edgoose, Adrian Nelson and Catherine Gross (see Table 4-2 for further details). The key secondary texts analysed were the Australian Government *Fact Sheet: Mandatory Renewable Energy Target Overview* (Australian Government Office of the Renewable Energy Regulator, 2006), the planning application *Hepburn Community Wind Park Application for Planning Permit* (Hepburn Renewable Energy Association,

2006), the Victorian Government report *Renewable Energy Action Plan* (Victorian Government Department of Sustainability and Environment, 2006), the peer reviewed journal article *Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance* (Gross, 2007), the government document *Policy and planning guidelines for development of wind energy facilities in Victoria* (Sustainable Energy Authority Victoria, 2003), and the VCAT ruling *VCAT Reference P549/2007 Permit Application Number 2006/9231 C.F.R.   (2007)* (Victorian Civil and Administrative Tribunal Administrative Division, 2007).

On 31 July 2007 *The Chronicle* (2007) published in Ballarat, Victoria published a news article entitled 'VCAT gives proposal green light'. This article refers to the decision of the Victorian Civil and Administrative Tribunal (VCAT) to approve a community ownership wind farm project to be built at Leonard's Hill in Hepburn Shire, Victoria. It has taken several years for this project, the first permit approved community wind, or indeed renewable energy, project to get to this stage in Australia.

5.4.2. Context

Wind farms became a large scale energy source in Australia in the early 1990s. As of December 2007, 817.275MW of wind energy generation had been installed with a further 6155.42MW proposed (Auswind, 2007). That generation can be broken down on a state basis as shown in the following table (Table 5-4).

Table 5-4 Australian Wind Generation

State	Installed (MW)	Proposed (MW)
Western Australia	198.56	242.80
Northern Territory	0.08	0
Queensland	12.46	176.02
South Australia	387.90	1868.90
New South Wales	16.62	1087.90
Australian Capital Territory	0	0
Victoria	133.77	2384.50
Tasmania	67.28	395.00
Australia (Total)	**817.27**	**6155.42**

In 2005 electricity was produced from 50.6GWe capacity of which fifty seven percent was coal fired, twenty percent hydro and eighteen percent gas. Victoria's main fuel is

lignite or brown coal. Electricity is mainly produced near the urban load centres (Australian Uranium Association, 2007).

5.4.3. Familiarity with community ownership

Adrian Nelson was, at the time of our interview, working on contract for the Australian Alternative Technology Association (ATA) investigating regional and rural community initiated energy and water projects. Nelson is also a director of the Clifton Hill/North Fitzroy Community Bank, which is a Melbourne branch of the Bendigo Bank. As such Nelson was well placed to comment on the variety of ownership models available to community based initiatives in Australia. According to Nelson there are two hundred community branches of the Bendigo Bank in Australia: 'That's 200 communities that have probably raised … $AU400,000 or $AU500,000 each to start a company, run a bank … probably 500,000 shareholders' (Nelson Interview, 2007). He believes that it is;

> a powerful community model …it's expanded into community telco's … in a couple of communities they've established a community enterprise company that has the bank as a source of income [owning such things as petrol stations]. It's almost back at the old co-op idea where there is this company in the town that owns a whole bunch of the utilities and assets that the town needs which makes profits most of which go back into the town (Nelson Interview, 2007).

Community banking using a franchise model is the Bendigo Bank's point of difference from other big banks, and has been the backbone of its business growth in last decade. It is still Australian owned with a shareholder base of ownership rather than big institutions. Bendigo Bank is a country town bank that provides the model, process and line of governance that gives funders a sense of comfort (Nelson Interview, 2007).

The key players in the Leonard's Hill project are David Shapero of Future Energy based in Melbourne, and the Hepburn Renewable Energy Association (HREA), based in and around Daylesford, 10 kilometres from Leonard's Hill, Victoria. Per Bernard is the president of HREA, and a partner in an architecture and building practice in Daylesford, who was born and brought-up in Denmark and wants to make a positive difference with respect to climate change. David Shapero, the Managing Director of Future Energy, has a background in financial services and maintains that community ownership is largely a financial exercise (Shapero Interview, 2007). However, Shapero

has also had an interest in renewable energy since his teenage years in the 1970s. Whilst researching business opportunities in renewable energy two people independently suggested to him that community ownership was the 'way to go'. He quickly established Future Energy and first worked for about a year for big wind developers to gain experience whilst looking to identify sites suitable for Future Energy projects. The objectives of Future Energy are:

- Establish renewable energy projects which give attractive returns to community investors
- Help communities produce their own green energy
- Give support to community based energy conservation programs
- Strive to be a leader in the development of community owned renewable energy projects (Future Energy, 2006)

John Edgoose has a background in energy efficiency and renewable energy and manages the Renewable Energy Support Fund (RESF) for Sustainability Victoria (SV). The purpose of the RESF - part of the Victorian *Energy Technology Innovation Strategy* – being to encourage innovative use of medium sized (20kW – 5MW) proven renewable energy technologies in Victoria. The Fund, by providing up to twenty percent of capital costs, seeks to do this by demonstrating the successful application of renewable energy projects helping to reduce the barriers to future projects to enable widespread replication.

Catherine Gross's academic research focuses on the justice and community fairness of renewable energy and water supply related developments in Australia.

5.4.4. Advantages and successes of community ownership

Because of the stage that Australia is at in the development of community ownership interviewees were more focused on the barriers that were to be surmounted and what measures were needed to facilitate community ownership. As was pointed out by many interviewees the success of the first community ownership scheme will be very important to the progress of subsequent schemes.

5.4.5. *Barriers to and drawbacks of community ownership*

Gross (Gross Interview, 2007) suggests, from her research experience in Australia, that wind farm proposals have the ability to split communities and are a potential site for the collision of distributive and procedural justice. In Australia the term 'blow-in' is used to describe people who bought property in an area as a lifestyle decision, because of the way they perceive that area to be. Gross suggests that these are people who are likely to be in opposition to wind farms because they want to 'keep things the same' (Gross Interview, 2007) and do not necessarily have to face the economic reality of making a living in the locality. Conversely, Gross also suggests that farmers and landowners 'think that you do need change' (Gross Interview, 2007) and may be likely to support wind farms if they add an additional economic value to farm land. Gross makes the point that in Australia the form and depth of 'community consultation is not prescribed', and that even when consultation occurs 'the process is different for everyone', as there is no guarantee that people will see public notices advertising meetings or similar attempts at consultation (Gross Interview, 2007). Gross's experience is also that opposition groups form around the Country Guardian's model whereas people in favour of wind developments are less likely to form support groups and as a result are less likely to be heard, 'outside area people are brought in to public meetings by the Guardians and the pros get drowned out' (Gross Interview, 2007).

Turbine delivery times are a significant factor in the planning of the HREA project in Australia. The erection of large turbines requires specialist, heavy and expensive machinery which is also in high demand, and any subsequent turbine maintenance also requires this large scale machinery. As Gipe points out:

> a wind turbine is a big piece of machinery … and things break and need to be fixed. One turbine is difficult to service because you don't have one person who can service it, if local technicians can't fix it then you need to fly someone over (Gipe Interview, 2007).

Currently there is no Australian owned large scale turbine manufacturing in Australia, although the participants suggest that this situation may change in the short to medium term.

The Victorian Government have identified other barriers to the uptake of renewable energy including the connection process for new renewable energy generation and the

pricing framework for allocating network benefits to renewable energy generators (Victorian Government Department of Sustainability and Environment, 2006). In order to obviate these issues Victoria is participating in the national Ministerial Council for Energy (MCE).

5.4.6. *Impact of community ownership on public perceptions of wind energy generation*

Edgoose believes that the Landscape Guardians (groups set up in many countries to oppose wind farm developments) find community based projects threatening 'because they can't just say it's big companies ripping profits out of the locals at their expense and nobody supports it' (Edgoose Interview, 2007). He suggests that those who are opposed to the projects are very vocal and sound knowledgeable, they 'are very politically active and therefore powerful even though they may not be accurate' (Edgoose Interview, 2007).

5.4.7. *What facilitates community ownership?*

Nelson believes that 'regional rural people have a needs based history of getting out there and doing things' (Nelson Interview, 2007) and Bernard is convinced that 'we as a community can make a difference … positive strong important differences' (Bernard Interview, 2007). It is clear in the case of HREA, as reported in the interviews with Edgoose, Bernard and Shapero, that the ground breaking work that has been put into the Leonard's Hill scheme is crucial for giving an impetus to other community renewable energy projects that are waiting in the wings. Bernard says that 'we are the group everyone wants to talk to … the spark of interest comes from the community but you need the knowledge held by the likes of Future Energy' (Bernard Interview, 2007). Edgoose made it clear that this is why the project received the funding from Sustainability Victoria, 'turbines are not innovative per se' but Sustainability Victoria recognised that the 'pioneer project hits more barriers', and that to some extent subsequent projects would also have a template to follow (Edgoose Interview, 2007).

However, once a community has gained some expertise from negotiating policy, funding and planning frameworks they then become a resource for other communities.

It is clear from discussions with Bernard (Bernard Interview, 2007) that Australian communities want to speak to HREA even though Future Energy is the source of much of HREA's knowledge.

Edgoose believes, in common with Dodd that a potential community scheme needs the input of a support framework such as supplied to HREA by Future Energy or to Gigha by the HICEC:

> you need a good technology co-ordinator provider, it's too hard for a community to do on their own … they need local champions and a Future Energy to help deliver it and they need to [be able] to pay for it (Edgoose Interview, 2007).

The Victorian electricity supply system is entirely owned and operated by the private sector and as a result, in order for the State to meet its goals for growth in renewable energy generation, the private sector will have to invest in renewables (Sustainable Energy Authority Victoria, 2003). The Victorian Government is therefore trying to create an environment that is attractive to private investors. In 2001 the Australian Government's Mandatory Renewable Energy Target (MRET) came into operation in an attempt to encourage the development of renewable energy production and reduce greenhouse gas emissions (Australian Government Office of the Renewable Energy Regulator, 2006). Applying nationally and ending in 2020, the purpose of the MRET is to encourage the generation of an additional 9,500 GWh of renewable energy by 2010.

With specific relevance to small-scale wind generation, part of the role of the *Wind Energy Development Act* (2004) is to provide a clear pricing framework for small wind generators. The amended *Policy and planning guidelines for the development of wind energy facilities in Victoria* (Sustainable Energy Authority Victoria, 2003) include: a definition of wind energy facilities; the State planning policy for wind energy facilities; information regarding planning permit applications and assessment; and criteria to protect critical values.

5.4.8. Exemplar - The Leonard's Hill project

5.4.8.1. Background

Shapero was talking to a farmer at Leonard's Hill (see Figure 5-2 the location at Leonard's Hill where the turbines are to be erected) at the same time that he first met Bernard in January 2005 (Bernard Interview, 2007; Shapero Interview, 2007). Bernard, living in the 'green, progressive community' of Daylesford was thinking about a community wind farm. He had been to a public meeting in Dean, a community twenty kilometres from Daylesford, about a proposed twenty turbine wind farm. There was a big turn out from the Dean community 'all angrily against the proposed turbines'. Bernard felt that 'if this is how local communities respond to wind farm proposals, there is no change in this country' (Bernard Interview, 2007).

Figure 5.2 Leonard's Hill wind Mast
(Source: personal photograph)

Bernard 'got a sense of trust from his first meeting with Shapero … it needs a driver [and] it's lucky we found Future Energy and at that time in their development' (Bernard Interview, 2007).   In September 2005 with Future Energy's help, a public meeting was arranged 'to gauge community interest in a community wind farm … there was a good turnout which nearly filled the town hall' to listen to presentations from a wind engineer, Shapero and individuals opposed to wind farms (Bernard Interview, 2007).   A questionnaire was circulated containing five questions used to

gauge community interest, which received a very positive response. As a result HREA was formed a couple of months later to generate support for a planning permit application, believing that 'a large membership base would send a powerful message to council' (Bernard Interview, 2007). This tactic worked, as out of the three hundred and fifty members of the association at the time of the permit application, three hundred and thirty put in submissions in support of the application, the 'most important part of this project is that it's truly owned by the community, not just in monetary terms' (Bernard Interview, 2007). This is backed up by Edgoose who says that it is a:

> different paradigm for energy generation when communities are prepared to back something with a very strong statement rather than [having a scheme] imposed by government … no polls are going to be as good as this is' (Edgoose Interview, 2007).

5.4.8.2. Funding

'Future Energy is effectively like a wind farm developer, taking all the risk so payment comes with the success of the project' (Shapero Interview, 2007). The Leonard's Hill project was the third project they discussed with Sustainability Victoria, and Shapero says that they were essentially taking a concept to Sustainability Victoria, with the HREA being the best project because of its high profile and good site. Sustainability Victoria allocated $AU975,000 or about ten percent to the project costs and also provided support in kind on a number of issues. Sustainability Victoria found the HREA project to be 'well thought out by Shapero [and was] impressed by the month by month growth of the HREA membership' (Edgoose Interview, 2007). Projects have to be financially viable to receive support, but it accepted that a first project might be financially marginal because of the barriers faced (Edgoose Interview, 2007).

5.4.8.3. Communication

Edgoose identified that the HREA project was well handled with robust local communication (Edgoose Interview, 2007). Both Shapero and Bernard identify a number of strands to that local communication including talking, street tables, flyers, newsletters, press releases, website, home visits, and bus trips to wind farms (Bernard Interview, 2007; Shapero Interview, 2007). Bernard wanted to engage with locals and

tourists, because he had identified that tourist support was important because of the importance of tourism to the local economy. It was also important to engage with, the local paper *The Advocate,* and it transpired that the paper was 'very supportive' (Bernard Interview, 2007). However, HREA did not talk to general media until after the RESF funding was secure:

> because of [local and national] concern about wind turbines generally … the general media want to do things their way, and if they can find one person [in opposition] they will use them to hype the story (Bernard Interview, 2007).

Bernard stated that when they had located the site they started visiting neighbours on many occasions. All went well until they were asked questions about wind 'myths' and the person who eventually led the appeal to VCAT got involved:

> some neighbours are members and the most affected neighbours are supportive … most of those against the project are old people who are threatened by changes and who do not really comprehend climate change … some are jealous of the landowner making the money … [and some are recent incomers who] don't want it because they are concerned about land values (Bernard Interview, 2007).

These recent incomers are the 'blow-ins' identified by Gross in her research who are new to a locality and are concerned about the potential negative effect of development on land values. (Gross Interview, 2007)

5.4.8.4. The ownership vehicle

Shapero believes that starting as an association rather than with an ownership vehicle, allowed the Association to establish and demonstrate its support to the council, and Bernard was very good at leading in this role (Shapero Interview, 2007). Shapero and Bernard both believe that forming a co-operative as the ownership vehicle has many advantages over a public or private company or a managed fund/unit trust, as it is community based and no-one can take control as there is one vote per shareholder as opposed to per share.

The Hepburn Community Wind Park Co-operative Ltd was officially registered on 28 August 2007 with nine directors; some local, some week-enders from Melbourne with a wide spread of skills. The co-operative will be known as Hepburn Wind, the owner and operator of the wind park (Hepburn Renewable Energy Association, 2007b). The

farmer owning the site is not a member of the co-operative and 'the co-operative will lease the land for the wind farm from the farmer, assuring the farmer of an income with least risk' (Shapero Interview, 2007).

The co-operative will sell all the electricity produced to an electricity retailer and also sell the RECs and all the financial benefit will come back to the community. Investment in and ownership of Hepburn Wind 'will be open to everyone however, priority will be given to the local community' (Hepburn Renewable Energy Association, 2007b). Bernard hopes that all of the shareholders will come from within a radius of ten kilometres around Daylesford/Hepburn Springs. Typically minimum shareholdings are $AU5000 worth of shares. Bernard explains that this is because annual auditing fees are based on the number of shareholders, not shares and as a result it is necessary to balance costs against value of shareholdings. However, investment groups can be established where a group of individuals can become one legal shareholder meaning that all members of a community can have ownership of the project. As of July 2007 the board had not decided on the minimum shareholding. Bernard expects that:

> a community fund will be established which will at least partly be used for renewable energy initiatives [in the town] … it is up to the board how much money is allocated to the fund (Bernard Interview, 2007).

5.4.8.5. Planning issues

The whole of Hepburn Shire has only five thousand homes, with just over two thousand of those homes being in Daylesford. HREA in July 2007 had four hundred and thirty members, regarded by all of those interviewed as a high level of membership. According to Shapero, a local champion is crucial:

> Per himself has just been tireless [and as a result] is much better known now, you need someone locally like him … local support is extremely important especially for a first scheme [FE and HREA wanted to show the council that] the more difficult decision for them was to say no (Shapero Interview, 2007).

Wind farms under a thirty megawatt threshold require consent from the local council rather than the Minister and this was the first wind farm to go through the council consenting process in Hepburn Shire. The council officers were in favour of the project, but according to Shapero the 'councillors did not take a great deal of interest in getting involved … it was a close vote at council' (Shapero Interview, 2007).

The council decision was subsequently taken to appeal at VCAT. FE and HREA 'improved what was already a robust application, as good as for a much bigger project [and FE also] took a financial risk and hired a barrister', believing that their role is pioneering and that they were being watched by other communities (Shapero Interview, 2007).

Eighteen houses are within one kilometre, but only seven or eight took part in the appeal to VCAT whose rules are that any individual can take an appeal to VCAT with an appeal costing $AU300 (Shapero Interview, 2007). Edgoose suggests that most objectors lived at a distance from the site and some lived in Melbourne. He believes that beyond a two hour commuting distance from Melbourne opposition drops off dramatically to such proposals, 'it's about the demographic of objectors and is a very strong NIMBY thing … it's about the value of their land' (Edgoose Interview, 2007).

Edgoose believes that if the project had been lost at VCAT, other communities would have been deterred. VCAT imposed extra conditions, but that 'the project got eighty to ninety percent of what they needed' (Edgoose Interview, 2007). The biggest issue according to Edgoose was bat monitoring, and now there has to be an extended all season bat monitoring programme which Edgoose believes that only two people in Australia can do. This is the first time VCAT has had to rule on such a proposal as the bigger schemes go to a planning panel and a Senator makes the decision. As a result Edgoose believes that VCAT are being over cautious because they are unfamiliar with the type of project. He states that the panel have imported conditions from big wind farms with costs that are disproportionately high for Future Energy and HREA to bear: 'VCAT haven't taken on the socially responsible nature of project or cost impact of their ruling' (Edgoose Interview, 2007). Edgoose also considers that;

> the Landscape Guardians are very politically active and are therefore powerful even though they may not be accurate … [the objectors] did not put up expert witnesses and so could not be cross-examined so they were not exposed to probing questions, no rigour … they will quote newspaper articles as their authority. The only appeal is to take VCAT to the Supreme Court and that is very expensive and rules of evidence apply … [the objectors] would rather use their website and promulgation of myths' (Edgoose Interview, 2007).

5.4.8.6. Grid connection

The wind park will be connected to Powercor's local electricity grid network. HREA is fortunate that there is already an overhead electricity line across the Leonard's Hill site. HREA's connection to the grid will be underground (Shapero Interview, 2007). Shapero had, at the time of his interview, been talking to Powercor for a year. This is the first connection of this kind for Powercor, and they have to look overseas for suitable models. Edgoose believes that 'the distribution company is reasonably happy', but he cautions that 'sales could be more difficult because retailers often only want to deal with big companies for the supply of renewable electricity'. Vertical integration in the market also makes it hard because retailers are also generators now:

> … even though never part of the original deregulated market, and this tends to cut out small players who can't access the market, for embedded distributed generation. Small generators cannot retail to customers, but retailers who have bought hydro schemes or built their own wind farms can sell from one arm of the company to the other. Small generators are pushing for change but there has been no move so far (Edgoose Interview, 2007).

5.4.8.7. The Future

Overall $AU9,000,000 needs to be raised to purchase and commission the two new two megawatt turbines, with at least $AU4,000,000 coming from the local area. 'Hepburn is eclectic, with lots of people with investment money', the fundraising is intended to be launched by the end of 2007 with a three month period to raise the money (Shapero Interview, 2007).

It could take the project eighteen months to source turbines due to a worldwide dearth or turbines, 'and crane availability is a real issue' (Bernard Interview, 2007). According to several interviewees, HREA needs two megawatt machines of the right height so that they do not need warning lights, which are expected to be commissioned in 2009.

5.4.9. Conclusion

The key features of the Australian study are listed below (Table 5-5). Because the HREA project is an Australian first it is not possible to obtain answers to some of the

interview questions in any more than a speculative manner. However, the experience gained in Victoria is potentially very useful to further nascent projects in Australia and to potential projects in other countries such as New Zealand.

Table 5-5 Australian Case Study Key Features

	Status as of October 2007
Existing wind energy ownership models	Corporate.
Financing model, policy structure and tariffs	Largely corporate investment dependent. Sustainability Victoria support for innovative renewable energy projects. Renewable energy certificates.
Planning framework	<30MW local authority approval, > 30MW ministerial approval. Appeal to VCAT.
History of community ownership or Co-operatives	Community banking operated by the Bendigo Bank.
Current examples of community wind energy ownership	HREA project is the furthest advanced and the only project to be permit approved, but yet to be financed.
Commercial scale wind turbine manufacturing	In development.
Nuclear energy perspective	Large uranium resource. Federal government highly supportive of nuclear energy.

5.5. New Zealand

5.5.1. Introduction

Although there are currently no examples of community wind turbine ownership in New Zealand there are many individuals who have a significant experience of the electricity industry and renewable energy policy and practice including the history of, and potential for community ownership. The interviewees were Fraser Clark, Doug Clover, Jeanette Fitzsimons MP, Sheralee MacDonald, Robyn Phipps and Ian Shearer (see Table 4-2 for further details). Clover was from 2000 to 2007 the Principal Environmental Investigator for the Parliamentary Commissioner for the Environment, working mainly in the energy field and specifically on electricity. Clark is the Chief Executive of the industry body the New Zealand Wind Energy Association (NZWEA). Shearer is a former manager of the same organisation, the NZWEA and is a member of the Sustainable Energy Forum (SEF). Jeanette Fitzsimons MP is the Co-leader of the

Green Party of Aotearoa/New Zealand and the Labour Government Spokesperson on Energy Efficiency and Conservation. MacDonald is the Marketing Manager for wind turbine designers Windflow Technologies and Phipps is a Senior Lecturer in the Institute of Technology and Engineering at Massey University, Palmerston North, who has specialist knowledge of public involvement in wind farm siting, and the effects of wind farms on local communities.

The key secondary sources examined include: the government report *New Zealand Energy Strategy to 2050 – Powering Our Future* (Ministry of Economic Development, 2007a), the government *Report on Submissions – Draft New Zealand Energy Strategy to 2050* (Ministry of Economic Development, 2007b), the government report *New Zealand Energy Efficiency and Conservation Strategy – Making it Happen* (Energy Efficiency and Conservation Authority, 2007), the report *Wind Power People and Place* (Parliamentary Commissioner for the Environment, 2006a), the report *Renewable Electricity Generation Policy Mechanisms for the New Zealand Energy Efficiency and Conservation Authority* (Gipe, 2006b), the pressure group report *New Zealand Energy Revolution* (Greenpeace Aotearoa/New Zealand, 2007), *Guidelines for Local Authorities: Wind Power* (Energy Efficiency and Conservation Authority, 2004), the Churchill Fellowship report *'Winds Up'* (Ashby, 2004) and the journal article *Renewable Energy in New Zealand* (Barton, 2005).

5.5.2. Advantages and successes of community ownership

Interviewees were asked to reflect on the potential for the development of community wind turbine ownership in New Zealand on the basis of their experience in New Zealand and overseas. From his location in the UK Devine-Wright comments:

> Looking across to New Zealand if you have similar socio-economic problems, people living in fairly peripheral rural areas … communities which are finding it difficult to make ends meet because income from agriculture or tourism is quite small, then that could be a case where the Scottish model of peripheral community led wind energy developments could be quite successful (Devine-Wright Interview, 2007).

In a similar vein, and despite a policy direction that has made it very difficult for community ownership of renewable energy generation to take place Shearer still believes that:

> It is inevitable for sustainability that we are going to have to have community power systems again. It is so inevitable, that it will happen. What we are going through now is delaying tactics … we know that government while applauding it if it happens, will probably not bend over backwards to change it. The big power companies generate a huge amount of money for government revenue and there is big money involved (Shearer Interview, 2007).

Clover believes that 'community energy will start in rural communities and then move to bigger rural towns before going to the city' (Clover Interview, 2007). One of the advantages Clover sees in community wind generation is that it overcomes the 'lumpy investment problem' when large scale generation is relied upon, and this new generation coming on stream causes over capacity and supply, 'generators are happy because they are running close to capacity, community wind overcomes this because it can be built incrementally' (Clover Interview, 2007).

5.5.3. *Barriers to and drawbacks of community ownership*

Clover suggests that most community ownership models 'are just joint ventures with the landowners' (Clover Interview, 2007). He asks the question:

> how do people that can't afford it get involved? Are there elements of a model that can be non-financial (such as where everyone affected by a project is allocated shares even if they cannot afford to buy them)? Could people be trained to work on turbines (to develop and maintain skills, money and knowledge within a community)? Iwi have their own decision making structures which should make it easier (Clover Interview, 2007).

Echoing similar concerns, Fitzsimons asks:

> Where does a community get the very considerable capital [to buy a wind turbine] … and then how do they return on that capital? … where do they get the backup from … is the local lines company going to want substantial generation embedded in their lines which is going to require quite lumpy generation to back it up? (Fitzsimons Interview, 2007).

MacDonald reports that approaches to Windflow Technologies from people interested in community ownership in New Zealand are usually about *how to go about* community ownership:

> lots of the time … it's got to a point where they have gone 'it's a bit tough at the moment, we'll just put that on a back burner and see what happens with the new government energy strategy or power prices or see it anyone else does it first' (MacDonald Interview, 2007).

MacDonald also reports that there is a:

> growing trend for getting smaller distributive projects around the country, the community ownership model for doing that is a really good way to go, and there are things that could help. But it's just a matter of getting the political will to do that because I think there will be a lot of lobbying from certain parties to say no, no just leave it under the big central electricity producers control … That's what will make or break it … it depends on how serious the government is to encourage renewable energy development by everybody (MacDonald Interview, 2007).

MacDonald points out that in New Zealand the resource consent process is 'costly and uncertain [with] lots of different consultants to pay for and potential additional cost of going to Environment Court' (MacDonald Interview, 2007).

Clover suggests that the NZWEA is an advocate for industrial wind power and that its members are driven by economic factors as they perceive them. He believes that they are driven by economies of scale and that they reduce unit cost by:

> getting lots of megawatts up there and lots of turbines and preferably both. They can do that in New Zealand because the generators have access to flows of capital and they've got guaranteed revenue streams and assets' (Clover Interview, 2007).

Both Clover and Shearer agree that in New Zealand the reluctance to revisit the electricity reforms is a serious draw-back in terms of policy development favourable to community based renewable energy generation (Clover Interview, 2007; Shearer Interview, 2007). Shearer argues that the people of Palmerston North and the Wairarapa basically built two community owned wind farms, Tararua 1 and Hau Nui 1:

> There were people with vision in … community owned facilities that saw the way of the world and knew which way we had to go and took these first steps and put them in. Then of course the government stepped in and 'buggered' it all up by changing the rules and no more [community wind farms]' (Shearer Interview, 2007).

Shearer holds that the 1998 energy reforms of the National government were driven with the aim of getting rid of cross subsidies because the community owned power companies were subsiding electricity costs to residents by charging businesses higher tariffs. The Electricity Reform Act forced the community owned power companies to split into line and energy companies. According to Shearer:

> The mistake the New Zealand [wind] industry is going down is that there is no win, win, win here; they are not community owned except in the absolutely broadest sense because Meridian … is at least … owned by *we* the tax payers.

> And there is no win, win, win and there is no attempt to make it a win, win, win and that's exactly the problem why there is no joy in ownership and sustainable energy, its just kind of battle, battle, battle against the big corporate stuff all the time (Shearer Interview, 2007).

According to Clover the 'big corporate stuff started with a competitive model, but this was then compromised so we got a series of vertical monopolies' (Clover Interview, 2007). Shearer states that 'Bradford removed the vertical integration but then provided lots of exemptions' (Shearer Interview, 2007). Shearer suggests that there is a constant search for exemptions under the Electricity Act. As an example he cites the East Cape where there is only one Transpower high voltage line serving the whole area. He believes that local wind farms would increase the security of supply. However, government refused to give the lines company an exemption to sell the power generated from their own wind farm to their own customers (even though they would give them an exemption to build the wind farm) because cross-subsidisation could result:

> You can generate the power and put it into your own network but you have to sell the power to Meridian or someone else and then of course they lose, the only thing that made it economic was to do it in the community and have the whole margin rather than selling it at the wholesale rate to Meridian and buying it back through their customers (Shearer Interview, 2007).

In their submission to the various draft consultations, MainPower, the North Canterbury lines company has made a similar point:

> MainPower believes that there needs to be a change in legislation to encourage wind farm and other renewable generation developments by lines companies. These changes include removing the remaining constraints on lines companies ownership of generation businesses, allowing them to hedge their own renewables-generated electricity and permitting the sale of electricity to consumers, unconstrained by owned-generation capacity limits (MainPower New Zealand Ltd, 2007: 1).

Clover suggests that the basic question is whether electricity is a social good or a product. In the current model it is a product, whereas in a community owned model it is a social good. He believes that the retail end is the main failure of the reforms since they have allowed the capture of the consumers by the generators:

> The generators have no incentive whatsoever to encourage their customers to be more efficient, to be more informed … or to send them signals about just how valuable the electricity is that they are using. The moment the generators bought the retailers after the 2001 dry year, they [started to] match their risk by getting the right number of customers to match their generation. The

model was that retailers would be separate and exposed on the market and that they would manage that risk by buying futures and looking at demand side. The margins at retail are low, generators … make big money by … selling into spot market. The theory was that retailers would have such low margins that they would diversify into distributed generation and energy efficiency (Clover Interview, 2007).

5.5.4. Impact of community ownership on public perceptions of wind energy generation

As previously stated, there are no current examples of community ownership of wind generation in New Zealand. Instead public perception of wind generation is governed by the existing corporate model of wind farm development. Wind farm aesthetics are argued by Gipe to be important in reducing intrusiveness, and thus important factors in overcoming psychological and spatial distance issues. In his visits to New Zealand Gipe has noticed the rush to use windy sites in the Manawatu. This wind rush creates 'wind ghettoes', large concentration of turbines in windy sites, which can result in a backlash from the local population although he believes this problem can be overcome with a two tiered tariff system which pays more for wind energy in less windy sites (Gipe, 2006b). There are elements of this 'wind ghetto' effect in the Manawatu (see Appendix 6 for images), where as of December 2007, there were four separate but geographically overlapping wind farms all using different models and designs of turbines.

Phipps et al found in their survey of the effects of the Manawatu wind farms (see Appendix 6 for images) on the community of Ashhurst (Phipps, Amati, McCoard, & Fisher, 2007) that some of those people who accepted the wind farms supported the 'idea that the only alternative to wind was nuclear and that those that did not like wind were seen as pushing everybody towards nuclear' (Phipps Interview, 2007). People were also largely unaware of the Energy Efficiency and Conservation Authority, and the things that they could do to reduce their own electricity consumption 'it comes back to that I don't own this problem therefore I have to have these corporations [the wind power generators] impose on me, they're saving me from a nuclear future' (Phipps Interview, 2007).

However it is clear from the enquiries made to interviewees including, MacDonald, Shearer, Clark and Fitzsimons that there are some individuals and groups who are aware of the concept, and potential of community ownership schemes and are keen to make the initial steps within their communities to investigate this potential opportunity.

5.5.5. *What facilitates community ownership?*

Clover believes that New Zealand needs 'a couple of community wind farms with notable people involved who can push government, or maybe a union who can push [the] Labour [Party]' (Clover Interview, 2007). This is a similar sentiment to that expressed by Gipe that 'one turbine can become a beacon for all the others' (Gipe Interview, 2007) and the same reason that is sited by Edgoose for Sustainability Victoria supporting HREA in Australia (Edgoose Interview, 2007).

Clover also believes that community wind farms create the need for a variety of community industries to look after the generation and maintenance of the turbines, and also have the capacity to form the basis of other community building such as in the Scottish example of the Island of Gigha. However, smaller turbines may also be required both for less developed countries and situations where turbines are to be positioned at the end of transmission lines where the network is not sufficiently resilient to cope with a 500kW surge (Clover Interview, 2007).

The importance of a local turbine manufacturing industry for the development of community wind farm ownership was noted by a number of the interviewees across the case studies, suggesting that the 500kW turbines currently being manufactured in New Zealand by Windflow Technologies are important for the potential of community wind turbine development for a number of reasons (see Appendix 6 for image). MacDonald from Windflow Technologies explains the local component:

> over ninety percent of the value of these turbines is manufactured in New Zealand. An off-the-shelf generator and some specialist castings come from overseas because Windflow Technologies could not find a company in New Zealand to make them. Manufacture takes place in Auckland, Christchurch and Dunedin and the towers are manufactured locally to where they are being erected (MacDonald Interview, 2007)

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According to Clover the Windflow turbines are a 'very clever design' with a variable pitch asynchronous motor which has less working parts to go wrong than a conventional turbine. New Zealand yachting technology was influential in the design of the blades which are built from wood, and combine strength, lightness and ease of construction, and are built from a locally available resource (Clover Interview, 2007).

Commenting on the Windflow turbines Fitzsimons states that:

> they are the intermediate scale … if you were going to build a community owned wind farm, they would be … the scale of turbines you would be looking for (Fitzsimons Interview, 2007).

Appropriate sizing of wind turbines is also a key factor in the development of community wind turbine ownership, 'a 500kW turbine on a good site would provide enough electricity for two hundred households' (MacDonald Interview, 2007), making it an appropriate size turbine for a smaller community project, where turbines can be added incrementally as finances permit and needs require. As discussed in previous sections, the trend to bigger wind farms means that smaller developers struggle to source turbines in quantities of less than ten. Manufacturing smaller turbines can therefore be a niche market both for community projects, and projects in less developed countries such as around the Pacific Rim. MacDonald believes that 'there will always be a market for smaller turbines, for smaller projects or on difficult sites where turbines can be erected with standard, readily available trucks and crane' (MacDonald Interview, 2007), a point supported by Dodd (Dodd Interview, 2007) in the case of small remote communities and islands. The Windflow turbine is also a two blade turbine 'which is not an issue for people who understand wind energy … they also need a much smaller area to erect on the ground' (MacDonald Interview, 2007).

Shearer and Gipe (Gipe Interview, 2007) suggest, many of the turbines currently in use in New Zealand are operating at 'well outside their capacity rating … the first Tararua 1 blades bent so much that they touched the towers and had to be replaced' (Shearer Interview, 2007) (see Appendix 6 for Tararua 1 turbine image). Windflow Technologies have designed their turbine for a Class 1A rating, with a life expectancy of twenty years. The first five turbines on the Te Rere Hau site are being assessed for this certification and Windflow Technologies hope that they will attain this certification by the end of 2007 (MacDonald Interview, 2007). The arguments made for a locally

based turbine manufacturing industry are further enhanced when the locally manufactured turbines are designed for the prevailing wind conditions. Shearer makes the point that although the Windflow Technologies turbines are cheaper than, for instance a Vestas machine, they have to prove their reliability, with the help of this certification to allow them to challenge in the market place (Shearer Interview, 2007).

In the New Zealand government discussion paper *Transitional Measures* (Ministry of Economic Development and Ministry for the Environment, 2006b) a series of options are considered to move towards low emissions electricity supply. Both Shearer and Clark (Clark Interview, 2007) believe that, following the various energy reviews, that feed-in laws are unlikely, but are 'a possibility, [but] my honest heart says no you are absolutely dreaming' (Shearer Interview, 2007). The *New Zealand Energy Strategy* and the *New Zealand Energy Efficiency and Conservation Strategy* prove Shearer's and Clark's assumptions to be correct. However, Shearer thinks that given the 2013 scenario (see Chapter 2 sections 2.7.1 and 2.8.1) government may:

> want to encourage small farmers, I mean farmers are going to get hit horribly because rural electrification is getting more and more expensive … there's huge potential in small schemes all over the place' (Shearer Interview, 2007).

Clark from a wind industry perspective advocates for a National Policy Statement and National Environmental Standards under the RMA to aid the development of wind farms through the planning process. He has concerns that planning concepts are applied on an inconsistent basis with relation to wind farms. He uses the example of proposed wind farms being declined which can be seen from an area designated as an outstanding natural landscapes but are not actually within the boundaries of those outstanding landscape areas (Clark Interview, 2007) (see Chapter 2.7.2.2).

However, he also makes the point that government knows it can fall back on coal even if they don't want to. Nevertheless, he also suggests that 2013 'should be a boom for sustainable energy' but that the Labour led government may be holding back in case National win the 2008 General Election and 'then have to undo Max Bradford's reforms themselves' (Shearer Interview, 2007).

Shearer believes that one of the major issues for a community development project is:

> balancing the economics, and if a potential project has an existing distribution line to feed into the economics are better. The servicing costs are high for one turbine. No subsidy makes the cost of power uneconomic. If we had a feed-in tariff that guaranteed them a small amount (it wouldn't have to be anywhere near the German ones) possibly even guaranteed a farmer fifteen cents per kWh, they'd probably rush to put them in' (Shearer Interview, 2007).

MacDonald believes that the issue with feed-in tariffs is levelling the playing field. She thinks that wind can stand on its own two feet, 'but it is not a level playing field because the fossil and think big projects were subsidised' (MacDonald Interview, 2007). MacDonald contends that it is more about getting the market conditions right, and using the polluter pays principle[11] rather than giving incentives to wind energy:

> One of the benefits of the feed-in tariffs is maybe not so much the additional incentive but the certainty of the power price which makes people know what value they will get from their electricity when they sell it which at the moment in New Zealand is really hard … with spot prices or trying to get a contract to buy electricity with one of the retailers because they are also generators and won't pay you any more than they can generate their own electricity for (MacDonald Interview, 2007).

5.5.6. Potential exemplars

Clover (Clover Interview, 2007) sees great potential for community developments starting in rural locations. The experience of Dodd (Dodd Interview, 2007) and Andrews (Andrews Interview, 2007) in Scotland also supports the value of community ownership for remote rural locations. Nelson makes the further point that 'in every community there's a couple of people who make it happen … they are usually … middle aged women and they are just unbelievable, they get things done' (Nelson Interview, 2007). Clark, MacDonald and Shearer have all been approached for information on community ownership by farmers and community members from locations such as the Coromandel, Lyttleton, Pahiatua, Waiheke Island, Stewart Island, and the Chatham Islands (Clark Interview, 2007; MacDonald Interview, 2007; Shearer Interview, 2007). Fitzsimons also suggests that an island community such as the Chatham Islands would be a logical location due to its excellent wind resource, remote location, and reliance on imported diesel for electricity generation. Because of the existence of a significant fish processing industry:

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[11] A compensation for harm principle, as opposed to a harm reduction precautionary approach (Eckersley, 2004).

> they have quite big refrigeration plant, and refrigeration plant with a bit of extra insulation can be used as part of your backup because you can turn it off when the wind stops for a few hours without the temperature rising enough to worry about … so on a day-night basis it can help stabilise your wind resource (Fitzsimons Interview, 2007).

When considering the challenges and environmental impact of constructing turbines in a remote location such as the Chatham Islands, Fitzsimons suggests that the analysis done by Windflow Technologies is:

> really interesting … about how much concrete, steel, environmental impact and roading gear you need per kilowatt hour produced, between the big ones and the small ones and the small ones come out much better (Fitzsimons Interview, 2007)

5.5.7. Conclusion

The key features of the New Zealand situation are summarised below (Table 5-6). Some features of the New Zealand situation, such as the existence of a New Zealand based turbine industry, are conducive to community ownership, whilst others, such as the lack of direct support for renewables reduces the potential for such developments.

Table 5-6 New Zealand Key Features

	Status as of October 2007
Existing wind energy ownership models	Corporate and SOE's
Financing model, policy structure and tariffs	No direct support. Emissions trading seen as a route to more renewable generation.
Planning framework	RMA
History of community ownership or Co-operatives	Farmer co-operatives Electricity lines companies operated as trusts until electricity reforms
Current examples of community wind energy ownership	None
Commercial scale wind turbine manufacturing	Windflow Technologies manufacturing 500kW turbine
Nuclear energy perspective	No nuclear electricity generation. Strong anti-nuclear movement.

5.6. Conclusion

The data collected in this chapter reveals many similarities in the experience of developing community ownership models between Scotland and Australia. Denmark

provides an early model of community ownership against which it may be possible to measure these more recent projects.

Given the experience from overseas it seems to be very important that a community has a knowledge base to draw on in order to withstand the pressures and deal with the complications of developing a community owned wind power project. There are issues of time and energy and expertise, including knowledge of the electricity market energy policy and knowledge of the planning system. Indeed, Windflow Technologies state that approaches to them in New Zealand about community wind are usually about how to go about community ownership (MacDonald Interview, 2007). As MacDonald noted, often it was easier to propose to delay action and take a 'wait and see' attitude (MacDonald Interview, 2007).

In Chapter 6 I will discuss the data gained from all three countries in relation to the literature reviewed in Chapter 3 in order to identify a possible model of community wind turbine ownership for New Zealand.

6. Discussion

Chapter 6 considers the implications of the data collected from secondary sources and the views of the interviewees on community ownership collected in Chapter 5, against the literature reviewed in Chapter 3, for the development of a model of community ownership of wind turbines in New Zealand that promotes holistic environmental justice. Devine-Wright argues that in the UK:

> when community renewable energy projects were successful they were an engine of social cohesion and they led to … sometimes pretty marked amounts of social learning where people through the process of developing the project became far more personally aware of … and had more positive attitudes towards renewable energy more generally. This is a kind of learning circle missing from a standard macro economic view of developing renewable energy (Devine-Wright Interview, 2007).

This promotion of social cohesion and social learning as a benefit of community ownership is arguably an advantage of bottom-up decision making as advocated by Schlosberg (2007) and Agyeman (2005) and seen in Nash and Lewis's discussion of their Dominant Social Paradigm (Nash et al., 2006) (see Chapter 3.2). This chapter reviews the key themes arising from the literature review against the key elements of the development of community ownership in Denmark, Scotland and Australia with the aim of finding the significant factors that can make community ownership a viable proposition for New Zealand.

6.1. Facilitation of and Barriers to Community Ownership of Wind Turbines

6.1.1. Landscape, land use and planning

Landscape, population concentration and land use, and the cumulative effects of existing developments underpin differences of context between urban and rural environments. Overlaid onto these variations are the different community values expressed in place-identity theory (Devine-Wright, 2005b), which impact on the success of government policy (Peel et al., 2007). In the UK and Australia, as well as New Zealand, there is perceived to be a growing public resistance to wind farm development (Gross, 2007; McLaren Loring, 2007). Academic research cited in

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Chapter 3 suggests that consultation methods leave much to be desired in terms of engaging with the public. In particular, the process is largely top-down in that a wind farm developer forms an opinion about where they would like to site a wind farm, and this proposal is then defended against public commentary, with the planning authorities making the final decision, as in the 'decide-announce-defend model' (Wolsink, 2000). Clover argues that in New Zealand government draft strategies are also presented in this manner. Evidence from Wolsink, Gross, McLaren Loring and others suggests that strategies that involve the public in a genuine manner in the planning process are less likely to generate opposition. This evidence is supported by the experience of HREA and HICEC.

Bottom-up planning as in Broad focus Civic Environmentalism (Agyeman et al., 2006) (and as opposed to the top-down emergence of sustainability as in Local Agenda 21 initiatives) (Dryzek & Schlosberg, 2005) can be consistent with principles of holistic environmental justice and is likely to be less costly for community projects. If a project gains community support from the outset, it is less likely to be contested through a court or tribunal process. However, because there is little pre-existing knowledge of community owned projects, planning regimes have, as is shown in the experience of HREA with VCAT, not yet developed mechanisms to deal with community ownership projects on a basis that is proportionate to the size and scale of the potential development, as compared with large wind farms. This is why support funding as provided by Sustainability Victoria to HREA is important to ground-breaking projects. Currently in New Zealand it is not obvious where such funding might be sourced as the recently announced energy strategies do not explicitly identify a need for such funding.

Despite the references to community ownership models in *Wind power, people and place* (Parliamentary Commissioner for the Environment, 2006a) the government reports released in October 2007, the *New Zealand Energy Strategy to 2050* (Ministry of Economic Development, 2007a) and the *New Zealand Energy Efficiency and Conservation Strategy* (Energy Efficiency and Conservation Authority, 2007) only make the following reference to community ownership:

> In 1996, New Zealand's first wind farm began operating at Hau Nui, in the eastern Wairarapa hills. The farm was set up by Wairarapa Electricity, a

> community owned power company ... Hau Nui was later bought by Genesis Energy in 1999 (Ministry of Economic Development, 2007a: 23).

This is despite the references to such a model as reported in *Report on Submissions: Draft New Zealand Energy Strategy* (Ministry of Economic Development, 2007b). In this report comment on community ownership was made in the context of the security of electricity supply under market conditions, and under lines company investment in generation as follows:

> Some Environmental NGOs and individuals suggested:
> • steps must be taken to restore community ownership of and responsibility for energy and electricity in particular;
> • a cooperative approach and values that will facilitate and encourage more reliable energy production and better energy savings than the current commercially focused system was needed (Ministry of Economic Development, 2007b: 30).

> Another suggestion was that a distinction be made between community/consumer owned businesses and private companies as the community/consumer businesses will naturally act in the interests of their owners when compared with a profit-driven monopoly. In those cases it was suggested that lesser regulatory compliance requirements could be applied (Ministry of Economic Development, 2007b: 32).

However, the *New Zealand Energy Strategy to 2050* does highlight the Genesis Energy *Schoolgen Programme* as an example of good practice that does have similarities to community ownership:

> Six primary and secondary schools in the greater Auckland area are using solar power to generate their own electricity under Genesis Energy's Schoolgen programme. The schools have had 2kW photovoltaic systems installed on the roofs of the school buildings at no cost. The systems reduce the financial and environmental impacts of the school's energy use, while giving students an opportunity to learn about renewable energy, energy efficiency, electricity generation and climate change. Genesis Energy hopes to extend the programme to schools in other parts of New Zealand in the future (Ministry of Economic Development, 2007a: 24)

Whilst 2kW solar photovoltaic systems are likely to have only a negligible effect on the environmental impact and electricity bill of a school, they are likely, in common with community renewable energy initiatives, to raise the awareness of energy efficiency and conservation within the school. This, as previously noted, is reported by Devine-Wright as being an advantage of community ownership projects (Devine-Wright Interview, 2007).

Each of the case study countries is developing long term energy planning and policy, with an increasing focus on renewable energy sources, mainly due to the necessity of addressing climate change issues (Meyer, 2007). In this context wind turbines have achieved an iconic status in representing measures to combat climate change and secure sustainable development (Peel et al., 2007; Toke & Strachan, 2006). However, land use planning systems and financial policy have mixed effects in terms of facilitating the development of wind energy (Peel et al., 2007; Toke, 2005c). Furthermore, environmental concerns regarding the deployment of wind energy in the landscape mean that wind energy 'has emerged as both a solution to environmental problems and an environmental problem in itself' (Toke et al., 2006: 155). For instance, wind energy can be one of a number of solutions to climate change, but at the same time presents a problem in terms of the appropriate siting of turbines in the landscape.

6.1.2. *The community/renewable energy interface*

The previous chapter examined the mechanisms by which community ownership of wind turbines have evolved in three different countries. The participants have identified salient features which they believe contribute to or hinder the success of such projects. Whilst ideal-type policy, planning and fiscal measures can be identified to promote community ownership, it is clear that few if any of those ideal-types currently exist in New Zealand. However, this not does mean that community ownership cannot exist in New Zealand. As the data in Chapter 5 confirms, a variety of approaches have been adopted to promote community ownership of renewable energy, and in particular wind generation, in the different countries studied. The Danish model gives a historical perspective on several elements of the pioneering activity of community wind energy generation and turbine manufacture, and, as such, is often regarded as a benchmark for judging the evolving models in other countries such as Scotland and Australia (Meyer, 2007).

It should be noted that HREA has adopted the terminology *wind park* as opposed to wind farm to refer to community owned turbines. This terminology not only draws a distinction between their project and larger scale, corporate ventures but also arguably

sounds more benign than the term farm. The term park could suggest public accessibility and recreation rather than commercial production.

One recommendation as a result of this research might be to put all those ideal-type measures into place and then assume that community ownership will inevitably follow. However, given government policy as of late 2007, it is more realistic to identify what can currently be achieved *in spite of* current policy and legislation and what modifications could be feasible to enable a ground-breaking project to proceed, such as in the Australian case study. The remainder of this chapter discusses the elements of developing a community ownership model for New Zealand as arising from the literature review and data collected. These elements include the effect of NIMBYism, turbine manufacture and repair, ownership models, policy flirtation, grid connection, the value of role-models, and cost and investment risk.

6.1.3. NIMBYsm

A theme in the case studies was public resistance. This is common to much infrastructure development. Theorising around the importance of public perception and related concepts, such as NIMBYism, in relation to the development of wind farms is extensive. The key theorist in this area is arguably Wolsink. NIMBYism suggests a principled support for a development that is no longer apparent when a development is proposed. However, research suggests that the situation is more complex than the NIMBY argument would suggest. Issues of proximity, physical characteristics, time frame, planning and energy policy and the top-down 'decide-announce-defend model' are all significant. Wolsink (2007a) also argues that individuals are particularly concerned about visual intrusion and the acceptability of turbines at specific sites, and are not concerned by issues pertaining to climate change. To remedy this situation Wolsink argues for collaborative approaches because:

> cultural preferences for countryside landscape preservation, a lack of locally organized and popularly owned wind power, and political institutions that do not support local collaborative approaches can all act to reduce the success of national wind power programmes (Wolsink, 2007a: 2694).

Building on Wolsink, Bell et al. (2005) suggests that planning processes invite the public to criticise and oppose proposals, rather than take part in a constructive process of

public consultation. An alternative model advocated by Bell et al. is, the trust building participatory 'consult-consider-modify-proceed' model. Place-identity theory (as discussed in Chapter 3) suggests that the local environment is very important to an individual's sense of self, leading to conflict when alternative uses are proposed for that environment. Again, the answer is held to be public participation and trust building as could be generated by local ownership. This is a complex situation requiring a layered policy environment in order to facilitate the implementation of renewable forms of electricity generation (Haggett et al., 2006; Peel et al., 2007).

It is clear that public attitudes to wind *power* are fundamentally different to attitudes to wind *farms,* and that this *gap* causes misunderstandings about public support for renewable generation. Wolsink claims that the impact of wind farms is largely seen by the public in terms of the visual effect on landscape values, and that the public may either support or reject that visual effect. As a result, emphasis on the environmental benefits of wind farms by proponents of wind power is misdirected. An assumption that opposition to wind farms is entirely due to selfish NIMBYism should also be regarded as misplaced, and instead concern for equity and fairness are explained as the key elements of NIMBYism:

> The crucial factor is not that residents have strong intentions to shift the burden to others, but that they consider it unfair that others, or the decision makers shift the burden to them. This suggests that the critical factor in NIMBY issues is not egotism … but fair decision making that does not cause any perceived injustice. The perceptions of fairness in decision making about siting facilities … are strongly connected with perceived environmental risk, and also with strongly deviating core values about how society should take such decisions (Wolsink, 2007b: 1203).

Wolsink argues that if all opposition to controversial land uses and facilities becomes labelled NIMBYism it is a label that has no explanatory value, because it leaves the cause of that opposition unexplained (Wolsink, 2007a). What becomes clear from this argument is that 'the key question is not whether national environmental policies directed at renewables are accepted, but rather whether individual renewable energy schemes themselves are accepted' (Wolsink, 2007b: 1191). If planners, policy makers and developers are addressing the issues of wind power rather than wind farms they will suffer from poor communication with the public, since if communication does not address the real concerns of people it will miss its target. Furthermore wind energy

policy is a governmental decision in most countries whereas zoning schemes are local political decisions. Wolsink suggests that:

> at the level of central government, there is a growing top–down, technocratic, hierarchical way of thinking about how the planning system must be shaped. This view on the practice of planning is mainly a myth, because although central authorities have legal competence for instructing local authorities about specific parts of their zoning schemes, these powers are hardly ever used in practice (Wolsink, 2007a: 2702).

There are clear differences in the rate of success of implementing wind power in different countries depending upon the methods used to develop and make decisions about projects. Wolsink, in common with other advocates of collaborative planning argues that 'the best way to facilitate the development of appropriate wind farms is to build institutional capital through collaborative approaches to planning' (Wolsink, 2007b: 1204) rather than limiting options to public participation to consultation after a project has been designed and announced as in the decide-announce-defend model (Bell et al., 2005). Wolsink suggests that the:

> announcement of a project suddenly creates a vested interest, and therefore it creates a state of vigilance, which starts a process of thinking and deliberation. This reconsidering has nothing to do with … [NIMBYism] in terms of vicinity or distance' (Wolsink, 2007a: 2699).

However, issues of procedural as well as distributional justice do come into play (Gross, 2007; Wolsink, 2007a). Both Gross and Wolsink suggest that 'the perceived fairness of the process is a crucial aspect of infrastructure decision-making, including that on renewable energy infrastructure such as wind power developments' (Wolsink, 2007a: 2701).

In New Zealand, as in the other case study countries, there is evidence of increasing public hostility to wind farm developments (Manawatu Standard, 2007). Recently proposed wind farms in both the North and South Islands have all encountered high levels of public resistance. Consultation processes appear to fall into the 'decide-announce-defend model'. The experience of the HREA and GREL suggests that embarking on, and commitment to, thorough and ongoing public information and consultation processes is a major advantage for community ownership initiatives, because gaining the approval of the majority of those who are likely to be affected by a wind energy project is a powerful support mechanism for any consent or appeal body to take into account (Edgoose Interview, 2007). GREL's experience suggests that even

community members who dislike turbines may still be willing to accept them if they can see a significant community benefit to their installation. McLaren Loring (2004) shows that the absence of high public profile opposition to a project is an important factor in its success. This absence is more likely if decision making is inclusive, reflecting holistic environmental justice principles (Agyeman, 2005; Schlosberg, 2007).

6.1.4. Localised turbine manufacture and repair

Issues of availability of turbines for small or intermediate scale projects have been stressed by many of those interviewed for this research in New Zealand, Australia and the UK. In Denmark, government policy is seeking to incentivise the replacement of smaller turbines with new larger machines, which, by the nature of the world wind turbine industry, are likely to be manufactured in Denmark. In Scotland, consortia are being established to enable community wind projects to order turbines on a collective basis to overcome some of the problems of turbine availability. In Australia, Hepburn Wind accept that it needs to take a strategic and logistically flexible attitude in order to take advantage of any opportunities that may arise to take delivery of the two required turbines at short notice. A locally manufactured supply of turbines would potentially greatly simplify the logistical organisation for HREA, so long as any such turbines were capable of meeting international construction and longevity standards for the wind resource.

Local manufacture facilitates the development of a local repair industry with access to skills and components. This should reduce operating overheads and the time periods in which turbines remain inoperable. This is not only important for the revenue of any project, but, as Gipe has shown, is also significant for maintaining public confidence and acceptance of wind turbines as public perception is easily dented by seeing turbines non-operational for extended periods. The use of locally manufactured turbines can enhance the environmental justice credentials of a project by building local employment opportunities in both construction and maintenance and by potentially using locally available raw materials.

Due to the exacting nature of the New Zealand wind resource (as is also the case in many parts of Scotland), and the current situation where many of the turbines operating in New Zealand are operating outside of their design specifications (see Chapter 5.5.5), it may be argued that a locally designed machine built and approved for the most severe conditions may be appropriate. Such machines, such as those manufactured by Windflow Technologies, if they can obtain international certification and perform to the required noise specifications, demand a skilled local labour force, and are designed to be built with locally available raw materials such as the timber for the blade construction.

As stated by Fitzsimons (see Chapter 5.5.5), intermediate sized commercial turbines are particularly suitable for community projects, particularly when designed for the prevailing wind conditions. Capital costs are high for turbines when compared with some other forms of renewable energy, and are therefore hard for communities of any size to afford. However, development can be incremental, because intermediate sized turbines require standard sized trucks and cranes for transport and erection, and therefore require narrower access roads for installation and maintenance. This factor is particularly important for the remote and isolated communities found in a number of areas of New Zealand.

As discussed by Dodd in the Scottish case study, remote projects at the end of transmission lines may only be able to install intermediate size turbines because the transmission lines may not be able to cope with larger loads. Network connection is also likely to be cheaper if the turbines are connected to the local distribution lines rather than the high voltage transmission grid. These considerations are also true for the New Zealand situation (Fairfax, 2008; Fitzsimons Interview, 2007)

6.1.5. The ownership model

Community wind generation ownership can take a number of forms but the most common structure is when a co-operative forms (such as HREA in Australia) to purchase one or more turbines, sell the electricity to an electricity retailer, and share the revenue amongst the members (Parliamentary Commissioner for the Environment,

2006a). As suggested in Chapter 5 the co-operative approach as advocated by Bernard and Shapero has the advantage of promoting a high degree of social justice for two reasons.

First, in a cooperative, voting operates on the basis of 'one member, one vote'. This means that owning a number of shares does not give an individual a greater say in the running of the cooperative than an individual who owns one share, emphasising participatory and distributive justice. In the event that individuals wish to leave the cooperative, a new member of the cooperative will not be able to buy a dominant or controlling influence. It can therefore be argued that it is likely that new members will join the cooperative on the basis of a philosophical sympathy for the principles of cooperative action and the specific principles of the wind cooperative in particular, rather than as a purely financial money making venture. As such even if a new member was from outside the geographical area they would still be a member of a community of interest, if not a community of place.

Second, to be financially viable from an accounting perspective, a cooperative is likely to have a minimum investment level which is likely to be unattainable for those on a low income. However, it is possible for individuals to group together a collective investment to make up one membership. Theoretically this collective approach means that even a child could invest some pocket money to form part of one membership, meaning that ownership could be open to all members of a community. Arguably this approach goes some way to meeting Eckersley's conception of an ecocommunitarian (see Chapter 3.4) and the participation and recognition elements of holistic environmental justice principles (see Chapter 3.6).

A community owned company as advocated by Nelson and Dodd, provides the prerequisites of holistic environmental justice in a slightly different manner. Ownership is on the basis of 'one share, one vote' with a designated maximum shareholding.   This means that voting rights are proportional to the level of shareholding but the cap means that no one shareholder can become significantly dominant.   Theoretically, corporate investors could purchase shares below the cap level when they become available but since shareholders are paid out after community

grants the level of return may be unlikely to interest individuals or corporate investors endeavouring to maximise their return against investment. In a sense the shareholders are primarily a community of interest. However, the organisations applying for and receiving the grants distributed by the trust will be from the community of place. The competitive nature of the application process is likely to mean that particular subsets of the community of place will receive the grants and would thus constitute localised communities of interest.

The model preferred by HICEC is a company limited by guarantee with an associated trust fund to distribute the community energy company profits to the local community. This model places a moral obligation on the directors.

In the case of the UK, Denmark, as the pioneer of community ownership of wind, is geographically close enough to be easily accessible. As Gipe points out in the interview, the Scandinavian influence has been important in the development of community renewable energy in the US (see Chapter 5.2.4). This Scandinavian influence is also seen in Bernard (Bernard Interview, 2007) who had no experience of community wind whilst living in Denmark, but still knew it was possible to achieve such a project in Australia. Coupled with Bernard's experience the input of Sustainability Victoria and Future Energy was crucial, from a financial and mentor perspective to ease the first project through the land use planning and capacity building phases of its gestation. The proximity of a ground-breaking community owned wind farm to other nascent schemes in Australia is regarded as very important by the Australian interviewees. It is likely that with publicity in New Zealand, the HREA project could be the catalyst identified by Gipe (see Chapter 5.5.5) as being helpful to the development of potential community ownership initiatives in New Zealand.

There are many other significant factors that come into play in the New Zealand context that make community ownership difficult to achieve by comparison with an ideal-type scenario as expressed by Gipe. As Toke (2008) makes clear, it is possible to succeed with a less than ideal energy policy scenario as is the case in the UK, Australia and New Zealand. However, the support of organisations such as the Highlands and

Islands Community Energy Company, Sustainability Victoria or Future Energy, is likely to be more important when the policy platform is more complicated.

Community ownership based on social justice must investigate the inclusiveness of a wind turbine ownership model to ensure that those on low incomes can participate. Because a cooperative model is based on the concept of one member one vote it seems to be the most egalitarian model. The cooperative model that HREA are adopting goes a step further by allowing investment groups to form so that individuals who cannot afford to purchase the minimum shareholding can still be part of the cooperative. Typically, according to Bernard (Bernard Interview, 2007), accountants recommend that minimum shareholdings are $5000 because annual audit fees are based on the number of shareholders. This sum would clearly exclude many low income individuals within a community, and therefore a mechanism such as investment groups is crucial for social justice.

6.1.6. Policy flirtation

Gipe believes that 'you cannot do community power without feed-in tariffs … even if you have feed-in tariffs there is no assurance that you will have community power'(Gipe Interview, 2007). Essentially what he is saying is that there are a number of policy initiatives that are required for community renewable energy to succeed but a feed-in tariff is the most important. By contrast Toke suggests that other policies can support community ownership so long as there is a sufficient level of interest and knowledge within a community to use the existing system. The HREA and The GREL exemplars would suggest that ground-breaking projects require a high level of technical and financially knowledgeable expert input to make progress. Many of the interviewees have made it clear that community ownership is an exhausting and complex process to bring to fruition.

Devine-Wright has identified what he calls a *policy flirtation* from government in Westminster whereby he has identified a likelihood that the macro and micro levels of renewable energy generation will continue to be supported in policy, but that the meso level will be squeezed out. The micro level places emphasis on personal responsibility, a significant element in neo-liberal and arguably 'third way' political

thinking (Fitzpatrick, 2003), emphasising the duality of rights and responsibilities as discussed in Chapter 3.

6.1.7. Grid connection

In most countries lines companies do not have experience or knowledge of connecting small scale electricity producers to the local lines network, and are understandably risk averse. Denmark has had the historical advantage of legislation requiring lines companies to provide access to the distribution network at reasonable cost to community owned projects and with tariff structures that are close to the retail price of electricity. Both the Scottish and Australian projects have what is argued by Gipe to be a less sympathetic electricity industry structure to work with because of the lack of feed-in tariffs. However, as argued by Toke, other structures can be made to work, as is the case in Scotland where the value of the ROC for each unit of renewable electricity generated is crucial to the viability of the GREL project.

As the Australian participants point out in the case of HREA the value of the green certificate for renewable generation is crucial to Hepburn Wind. However, as Edgoose and Nelson assert, Shapero has to undertake complicated negotiations with both the lines company and the electricity retailer to make the sale of the energy generated by Hepburn Wind viable.

Any community owned project in New Zealand would need to successfully negotiate very similar hurdles to those being encountered by Shapero and Hepburn Wind. Furthermore, because New Zealand already generates a significant amount of electricity from renewable generation, the New Zealand government is not seeking to incentivise renewable generation by means such as renewable obligation certificates (green certificates). The policy thrust as of 2007 is to rely on the New Zealand Emissions Trading Scheme (NZ ETS) to increase the cost of non-renewable electricity generation and, by default, increase the returns on investment of low emissions technologies such as wind generation. As discussed in Chapter 2, the NZ ETS, can be augmented by an offsets mechanism, similar to the now abandoned Projects to Reduce Emissions, which allowed Meridian Energy to trade Kyoto Protocol units for Te Apiti

wind farm generation. However, as of 2008, the government does not appear to favour this option.

6.1.8. The value of role-models

It seems clear from the data that knowledge of existing examples of similar initiatives is very important to the success of a project such as a community ownership initiative. In Denmark, community ownership is seen as unremarkable because it is commonplace. In the US Gipe shows that communities with Scandinavian ancestry have an understanding of what is possible, and an assumption that they should be able to undertake such an initiative. In the UK the experience of GREL is a 'beacon' on which to focus for other similar groups. Communities who are willing to share their experience acquire an additional potential revenue stream by being able to on-sell their knowledge, becoming a community based alternative to formal consultants. In Australia, the interviewees are very aware of the importance of the success of Hepburn Wind to the future of community ownership initiatives in Victoria and across the rest of Australia. Whilst Bernard, Edgoose and Nelson are all very clear that the professional input of Shapero into the project is crucial (as well as the financial support of Sustainability Victoria), they are also aware that other community initiatives are particularly keen to speak to Bernard and other members of HREA, the actual community members. In turn Bernard himself has the cultural knowledge of community ownership from his years spent in Denmark.

There are no community ownership models of wind, or other forms of renewable energy, currently in existence in New Zealand similar in nature to those discussed in the case studies. However, there is an institutional knowledge of co-operative ownership in the farming sector as well as earlier experience of a form of community ownership of energy prior to the restructuring of the electricity industry in the 1990s (McKinlay, 1999). A successful scheme by Hepburn Wind will have benefits for any nascent New Zealand initiatives because of its relative proximity and the similarity of the frameworks in which it will operate. In addition expertise gained by communities in Australia is arguably more readily accessible to New Zealand than is American or European expertise.

6.1.9. Cost and investment risk

On a unit basis the cost for a community of investing in electricity generation from wind is high. The capital cost of turbines is high and the potential cost of connecting into the electricity distribution infrastructure is open to negotiation with the established lines companies and retailers. Establishing long term contracts to sell electricity at a viable price for a community initiative is likely to be problematic and selling into the spot market would be a risky proposition for a small generator. Where tariff strutures such as a form of feed-in tariff are available to generators, there is much more certainty for small generators and as a result investment risk for potential investors is lower. Arguably, from a holistic environmental justice perspective, this certainty and reduced investment risk helps to promote justice in distribution, recognition and participation in a pluralistic market place.

The investment model as used by HICEC in Scotland is one route to navigating this problem, and the grant funding as secured by HREA from Sustainability Victoria is another. Both mechanisms acknowledge the community benefits, such as resilience, economic survival and up-skilling, of such schemes and acknowledge that pioneer schemes will face larger hurdles than those that follow.

Locating an appropriate support and/or funding mechanism will be a significant hurdle to overcome for a community that is seeking to operationalise a community owned wind park using a model that employs holistic environmental justice principles.

6.2. Community Wind and Holistic Environmental Justice

As indicated in Chapter 1 the task of this thesis is to identify whether it is possible for a model of community wind turbine ownership which incorporates principles of social justice and environmental sustainability, to exist in New Zealand. It is clear that there a number of combinations and permutations of a community ownership model that are potentially available for use in New Zealand. In the case of some parameters an ideal-type will not be possible to attain in the current political environment, due to legislative and policy constraints. However, it is not necessarily a straightforward task

because as Dobson asserts 'social justice and environmental sustainability are not always compatible objectives' (Dobson, 2003b: 83). This is because social justice is essentially intragenerational whilst environmental sustainability is more focused on intergenerational issues and the two may be in conflict. However, a counter-argument can be made that social justice and environmental sustainability are intrinsically linked, and as such environmental sustainability will be extremely difficult to achieve without a greater commitment to social justice (Agyeman et al., 2003). This counter argument is supported in the New Zealand context by Rixecker and Tipene-Matua (2003) who argue that indigenous peoples' desire to control their futures is inextricably linked to their simultaneous need for social, cultural and ecological justice.

The *Principles of Environmental Justice*[12] (Agyeman et al., 2003: 333-334) seek a form of environmental and social justice that is environmentally sustainable or non-anthropocentric, although Agyeman, Bullard and Evans (2003) concede that, in practice, this is difficult to attain. They argue that this has been due firstly to a reaction to the perception by early environmental justice activists that mainstream environmentalists only cared about wilderness and wildlife, and secondly because of the reactive nature of environmental justice movement mobilisations to specific occurrences within an affected community such as to the Love Canal toxic waste dump in upstate New York (Agyeman et al., 2003).

Dobson (2003b) also suggests that the objective of the environmental justice movement is to more fairly distribute 'bads' rather than reduce them in total. This relates to a debate which occurred during the 1990s which resulted in the name change from environmental equity movement to environmental justice movement. Essentially this was a debate about whether distributional equity (a version of the NIMBY debate) was sufficient or whether, as the name change implies, it was also necessary to focus on procedural inequity and productive justice issues of sustainability (Agyeman et al., 2003).

This version of environmental justice, however, still misses out the third factor, that is, recognition as in misrecognition or mal-recognition (Schlosberg, 2003, 2007).

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[12] Adopted at the People of Colour Environmental Leadership Summit, Washington, DC, on 27 October 1991.

Schlosberg argues that communities who have been ignored by government and/or the mainstream environmental movement require both recognition of the misdistribution of justice towards them and participation in the justice process, enabling subordination to be 'overcome by establishing the misrecognised party as a full member of society, capable of participating on par with the rest' (Schlosberg, 2007: 157). The arguments that Dobson (2000) and Low and Gleeson (1998) mount against environmental justice as a means of reconciling environmental sustainability and social justice, are based on a purely procedural perspective.

Both Young (1990; 2000) and Fraser (1997) make forceful arguments against justice based solely on issues of distribution and instead in Young's case, focus on a lack of recognition of identity and difference, particularly group difference, as in new social movements. Many social movements, including civil rights, lesbian and gay and green movements (in the sense that 'to do justice to nature means attending to issues of social and political recognition' (Schlosberg, 2007: 159)) have concentrated on forms of misrecognition (Schlosberg, 2003). Fraser pays particular attention to structural and institutional forms of misrecognition rooted in patterns of representation, interpretation and communication. Justice as procedure or process, as in authentic public participation, can be seen as a tool to achieve both distributional equity and political recognition: 'there is a direct link … between a lack of respect and recognition and a decline in a person's membership and participation in the greater community, including their right to participate in the institutional order' (Schlosberg, 2003: 84). Democratic decision making procedures require both equitable distribution of goods and social recognition as a condition for social justice, since barriers in either area can hinder the ability of communities or individuals to participate (Young, 1990).

This connection between place and identity is significant in that environmental damage to a place undermines the identity of those who live there. An environmental justice organisation draws individuals to it that may already have a sense of themselves as a social or spatial entity, a community of place. A mainstream environmental organisation is more likely to be a community of interest. If the two were to be combined, the resultant 'community' of communication could combine the strengths of both. It is interesting to compare this suggestion with Gross's research where a

corporate wind farm development led to tensions between procedural and distributive justice (Gross, 2007).

One critical element of the holistic environmental justice movement is that it is a bottom-up movement of community organisation and empowerment (Agyeman et al., 2003). Whilst traditionally it has been seen as reactive and problem focused, I would argue that projects such as HREA in Australia and GREL in Scotland could be categorized as bottom-up, holistic environmental justice organisations that are both proactive and reactive. They are empowering and inclusive of their communities, generating their own solutions to the problems they face. HREA is looking at both a problem (climate change) and a solution (community owned distributive generation). Likewise GREL are looking at addressing a problem (rural isolation, depopulation and economic impoverishment) and creating a similar solution. The equity and justice elements of the HREA and GREL projects are most clearly reflected in the ownership model and the inclusive approach of the projects.

6.3. Conclusion

In the course of this research a variety of pertinent documents have been released in New Zealand and in the other case study countries, and the government of Australia has changed to a Labor administration. As a result this research is based in a fluid environment where developing policy priorities change the options available to a potential community ownership scheme.

In New Zealand the energy and climate change strategies released in October 2007 could have made community ownership significantly more achievable, particularly if a greater emphasis had been placed on facilitating distributive energy production. Whilst the government is keen to progress climate change policies, from a largely ecological modernisation perspective, policy documents are still largely silent on 'peak oil' (see Chapter 2.8.5.3). Furthermore, the NZ ETS does not require thermal electricity generators to be responsible for their emissions until 2010, delaying the point at which renewable electricity generators will start to benefit. Until distributive generation is championed by government, progress is likely to be slow in implementing reforms to

the electricity industry to make it easier and more cost effective for small scale generators to produce and sell electricity at an economically viable level. From an holistic environmental justice perspective, the NZ ETS continues taxpayer subsidies to carbon emitters until 2025, meaning that there will be no net revenue gain to the economy to recycle into initiatives to improve the energy efficiency or develop renewable energy initiatives such as community ownership.

So, whilst it is theoretically possible for a wind turbine based community ownership scheme to proceed in New Zealand as of 2007, the scheme would face a number of hurdles. These hurdles would revolve around access to funding and investment capital and entry into and the operation of the electricity industry. However, if processes as established by HICEC/GREL or HREA were used, it is likely that such a scheme could overcome some local public opposition to wind turbines. If an appropriate ownership vehicle was used such a scheme could become a model for other projects to follow. Furthermore, should a company like Windflow Technologies be able to gain the required international certification, a New Zealand based initiative could benefit from the advantages described above of locally based design, manufacture and maintenance.

Whist ideal conditions do not exist in New Zealand for a community ownership model for wind turbines to be developed, it would still be theoretically possible for such a scheme to come to fruition, particularly with the aid of experience being gained in Australia and Scotland. The success of a first scheme would greatly aid the development of future schemes and create a climate of knowledge and experience which could open up policy and funding support for subsequent initiatives.

7. Conclusion

7.1. Introduction

The aim of this thesis has been to explore, in the context of green political theory, whether an appropriate model of community ownership of wind turbines that promotes holistic environmental justice can be achieved in New Zealand. Gipe, the American community ownership activist and renewable energy professional, emphasises that:

> if you truly want to develop community power you must make the system accessible to everyone who wants to participate, and accessible means that they have to be able to connect their wind turbines to the grid and they have to know what they will be paid for that electricity over a fixed period of time, you don't have any of that in New Zealand (Gipe Interview, 2007).

From Gipe's perspective, New Zealand is a long way from being able to develop community wind generation. However, the criteria advocated by Gipe as being essential are also not present in the UK or Australia, and both countries have either existing, or in development, community wind generation projects. Clearly it is possible to have a form of community wind generation without Gipe's criteria being met. However, it does seem apparent that community wind generation is more easily developed when mechanisms supporting Gipe's criteria are present in national energy policy.

Therefore there must be other factors which have influenced the success of community wind initiatives overseas, and which will be relevant to the success of any potential initiatives in New Zealand. The interview participants have identified factors which they believe to be influential in that success.

The discussion in the previous chapter suggests that holistic environmental justice criteria can largely be met in a community owned wind park. Whether that ownership is based on communities of locality or communities of interest, or on a co-operative or alternative ownership model, there are still holistic environmental justice benefits to be gained. The key determining factors are whether justice as distribution, recognition and participation are available to the community, however constructed, and whether

inter as well as intra generational justice is also part of the equation. Further levels of justice also need to be conferred from an ecological justice perspective.

The New Zealand Energy Strategy and New Zealand Energy Efficiency and Conservation Strategy do not address issues of potential community ownership. Further work is ongoing in a number of areas as outlined in the Strategies and as a result of the announcement of the Emissions Trading Scheme. It is too early to tell just how much difference that ongoing work will make to the potential for community ownership but distributive energy regulation and facilitation is a key area where progress needs to be made. However, until government is willing to recognise and factor in the effects of 'peak oil', distributive energy generation is likely to remain at the margins of electricity generation policy. Furthermore, it appears that the government wishes to use largely market mechanisms to encourage renewable energy development to meet its aspirational goals. As a result, wind energy developments are likely to become increasingly more economically viable by default due to the emissions trading element that will attach to fossil fuel based generation, rather than due to any direct support for renewable generation. This factor distinguishes New Zealand from the other countries in this thesis. Considerable academic effort has been put into comparing the relative benefits of renewable obligations and renewable energy feed-in tariffs for the promotion of renewable energy generation in the case study countries. However, partly because renewable generation is already dominant in New Zealand, the government is seeking to use climate change as its main policy directive rather than combining energy policy with climate change policy in the ways seen in the other case study countries.

The government's stated intention to produce a National Policy Statement regarding the planning aspects of wind generation, may be seen as an example of both a top-down and a bottom-up approach. It may be regarded as top-down in the sense that it could be used as a mechanism to over-ride local opposition to wind developments. This being the case it would not meet holistic environmental justice criteria for equity, recognition or participation. However, the National Policy Statement also has the potential to take away the inconsistencies that have developed in regional policy statements and their influence on regional and district plans. Many of these plans do

not deal well with landscape or renewable energy issues (Parliamentary Commissioner for the Environment, 2006a). As such any potential community wind energy proposal may benefit from the effects of a National Policy Statement but its strength will be in adopting informative, consultative, involving, collaborative and empowering processes as described in the Australian case study (Parliamentary Commissioner for the Environment, 2006a).

7.2. Who will benefit from a community ownership model?

There are a number of potential beneficiaries from the introduction of community ownership, ranging from government to industry to the community. All three parties would potentially benefit if the current concentration of wind energy generation in 'wind ghettos' were diminished, and increased levels of distributed generation would arguably increase the resilience of the grid. The New Zealand based turbine construction industry would also benefit, particularly given the world-wide shortage of turbines and the unwillingness of large overseas manufacturers to supply small orders and smaller output turbines. Arguably, home based manufacturing would be better placed to build turbines suitable for local wind conditions and the proximity of operational turbines to their manufacturing source would both improve maintenance and improve product refinement opportunities. In turn, there is the opportunity to stimulate employment in industries connected with turbine manufacture and to increase job opportunities in turbine maintenance. Smaller turbines require smaller scale machinery for erection and repair, in turn supporting employment in a home based maintenance, haulage and crane industry.

Community ownership has many potential advantages for local and interest-based communities, in terms of resilience, employment, investment, equity of distribution, recognition and participation. Evidence from overseas suggests that communities that are experiencing marginalisation, depopulation and lack of economic opportunity are particularly likely to benefit, especially if they are in remote locations with little infrastructure. Farmers and iwi gain financial benefit from the siting of turbines on their land. Lower degrees of public resistance to wind parks, than is currently the case with many proposed corporate wind farms, potentially means that wind parks will progress to the commissioning stage more quickly than corporate wind farms. There

is also evidence from Scotland that marginalised communities in urban areas could also be receptive to community models, particularly where existing 'brown field' sites can be utilised (Peel et al., 2007).

7.3. Who would resist the model?

Because there are no existing community owned wind parks there is a very low level of public knowledge of this model as a possibility which might lead to resistance on the basis that it is just not possible or too hard. However, New Zealand has a long history of co-operative ownership in agriculture, including what is now Fonterra. There is also a level of collective memory of a form of community ownership in the electricity industry prior to the 1990s reorganisation of the electricity industry. Furthermore, New Zealand's long standing opposition to nuclear energy may be significant in determining whether community ownership would be embraced despite the lack of current examples of such ownership.

However, it is argued that the corporate/SOE based ownership of the wind resource may resist any change from the status quo. A multiplicity of arguments can be made regarding the level of vertical integration within the electricity market, and whether this is beneficial or not to the efficient operation of the market. The case studies show that access to the local grid at non-prohibitary cost, as well as the tariff structure, is very important for community based generation. The government gains significant income from the dividend paid by the SOE energy generators – Meridian Energy, Genesis Energy and Mighty River Power - and may also therefore have a significant interest in maintaining the status quo.

7.4. What needs to be done?

There is a lack of information regarding community ownership models of renewable energy generally, and wind energy specifically. I believe that the level of success of the HREA wind park will be important, not just for further developments in Australia, but for New Zealand as well. Unless information is readily available, and localised to the prevailing New Zealand policy situation, the public are unlikely to even consider that community ownership could be an option. An organisation such as the Energy

Efficiency and Conservation Authority might be regarded as a suitable first point of call for that information. Equally, institutional knowledge develops as potential schemes negotiate their way through the planning and regulatory framework. As is clear from projects in Scotland and Australia, fledgling projects are particularly keen to consult with communities who have successfully progressed through different phases of their project's gestation.

A first project such as that of the HREA requires financial support and expertise such as provided in the HREA case by Sustainability Victoria and Future Energy or in Scotland by the Highlands and Islands Community Energy Company. An innovation fund, or a rolling credit facility that could support such a project in New Zealand is probably crucial, and, as in the words of Devine-Wright some 'heroic individuals' prepared to put in immense amounts of energy and time.

Some of that support would be required to help a community negotiate the planning process. Any future National Policy Statement may be helpful to community wind energy development. However, by its very nature a community owned project must facilitate the support of the majority of the affected community before it can hope to be viable. If, as evidence from overseas suggests, community wind developments are less contentious than corporate ones due to the bottom-up processes involved, there is likely to be less opposition. However, that situation would not preclude a potential project being taken to the Environment Court. Also, as was the case in Victoria, planning authorities currently have no experience of small scale developments and are therefore likely to adopt criteria arguably more suited to large scale developments. As a result, financial support and technical expertise are likely to be particularly important for a first development in New Zealand to establish a form of test case for other potential developments to follow.

Certainty of access to the electricity transmission system and the electricity market is crucial to the funding of any electricity generation proposal. Equally, certainty regarding the price to be paid for each unit of electricity generated is vital for a new community owned scheme. Currently, that kind of certainty is not available in New Zealand and much depends on the ongoing policy and process work generated by the

New Zealand Energy Strategy, New Zealand Energy Efficiency and Conservation Strategy and the New Zealand Emissions Trading Scheme.

7.5. Further research

This research has identified the need for further research in a number of areas beyond the scope of this study. Due to the newness of community ownership models in the UK and Australia, there is a need for longitudinal research to identify if and how in the longer term community ownership of renewable energy has met local objectives particularly in relation to sustainability and holistic environmental justice.

Research is required to identify how recently announced policy initiatives in energy and climate change can be refined and developed to support local ownership, particularly in relation to marginalised communities in both remote and urban areas. The initiatives announced in the *New Zealand Energy Efficiency and Conservation Strategy* need to be subject to ongoing evaluation to ensure they deliver their objectives. Further initiatives are likely to be required to support community ownership as this is an opportunity that has not as yet been sufficiently explored in policy such as the New Zealand Energy Strategy and New Zealand Energy Efficiency and Conservation Strategy.

Issues associated with NIMBYism, place identity and community participation need further research in the New Zealand setting if public resistance to wind farms is not going to create insurmountable difficulties for the further development of the wind resource. Research from overseas suggests that bottom-up decision making and planning processes (which incorporate the principles of holistic environmental justice) are crucial in gaining acceptance for wind turbines in the landscape. This research needs to be replicated in New Zealand alongside a trial community wind park that is comprehensively evaluated.

Appendix 1

Proposed and in-development wind farms in New Zealand as of December 2007 (Source: New Zealand Wind Energy Association)

Name	Developer	Notified (N)/ Commissioning date (CD)	Consent Region	Capacity	Status
Te Rere Hau	New Zealand Windfarms	2008-2009 CD	Manawatu	44 turbines 22 MW	Under construction
West Wind	Meridian	2009 CD	Wellington	62 turbines 142.6 MW	Under construction
Kaiwera Downs	Trust Power	Nov 2007 N	Gore	≤ 240 MW	In process
Waverley	Allco Wind Energy	Oct 2007	South Taranaki	≤ 135 MW	In process
Horseshoe Bend	Pioneer Generation	Aug 2007	Central Otago	≤ 1.8 MW	Consented
Te Uku	WEL Networks	July 2007	Waikato	≤ 84 MW	In process
Mahinerangi	Trust Power	Nov 2006	Clutha	≤ 200 MW	Consented and appealed
Project Hayes	Meridian	Nov 2006	Central Otago	≤ 630 MW	Consented and appealed
Motorimu	Allco Wind Energy	Aug 2006	Manawatu	≤ 110 MW	Appealed to Environment Court
Te Waka	Unison/Roaring 40s	Jan 2006	Hastings	≤ 111 MW	Rejected by High Court
Hawkes Bay	Hawkes Bay Wind Farm	May 2005	Hastings	≤ 225 MW	Consented (after appeal)
Titiokura	Unison/Roaring 40s	April 2005	Hastings	≤48 MW	Consented (after appeal)
Taharoa	Taharoa C /PowerCoast		Kawhia	≤ 100 MW	Consented but appealed
Taumatatotara	Ventus		Waikato	≤ 20 MW	Consented but on hold
Awhitu	Genesis	April 2004	Franklin	18 MW	Consented after appeal but on hold

Appendix 2

Section 46 of the Electricity Amendment Act 2004

Section 46A of the EAA also modified the EIR with regard to separation rules as follows:

[46A. Exemption for new distributed generation from new renewable energy source—
(1) The following activities do not cause any person to breach the ownership separation rules:

(a) generating electricity from new distributed generation using only—

(i) a new renewable energy source; or

(ii) a new renewable energy source and fossil fuels if fossil fuels provide no more than 20% of the total fuel energy input for the generator or generators comprising the generation plant in any 12-month period or any larger amount approved by the Minister under subsection (3):

(b) selling electricity referred to in paragraph (a):

(c) owning or operating, directly or indirectly, new distributed generation, or any other core generation assets used in connection with new distributed generation that is capable of generating electricity referred to in paragraph (a).

(2) Subsection (1) applies only if and as long as sections 24 and 25 are complied with (corporate separation and arms length rules).

(3) The Minister may increase the thresholds in subsection (1)(a)(ii) or in paragraph (b) of the definition of "new renewable energy source" to approve a particular activity for the purposes of subsection (1) (on the conditions, if any, he or she thinks fit) after first taking into account whether or not the generation uses new or advanced technology.

(4) in this section,—

"New distributed generation" means distributed generation that does not exist on the date on which this section comes into force

"New renewable energy source"—

(a) means an energy source that occurs naturally and the use of which will not permanently deplete New Zealand's energy sources of that kind, because those sources are generally expected to be replenished by natural processes within 50 years or less of being used; but

(b) does not include hydro or geothermal energy sources at a generator or generators comprising a generation plant that has an aggregate generating capacity (determined according to nameplate or nameplates) of more than 5 MW, unless approved by the Minister under subsection (3).

(5) This section does not limit section 5(2)(e) (exclusion from definition of electricity supply business).] ("The Electricity Act," 2004)

Appendix 3

Generic Interview Schedule

Is there an appropriate model of community wind turbine ownership for New Zealand?

Thesis Interview Schedule

- Please tell me what you understand community ownership to mean.

- How long have you known about and/or been involved with community ownership

- Please outline your involvement in projects involving community ownership of wind turbines.

- What do you think community wind turbine ownership has accomplished in the projects you have been involved with?

- What are the barriers to community wind turbine ownership?

- What factors facilitate community wind turbine ownership?

- What provided the impetus for your interest in this model of wind turbine ownership?

- What are the most important factors in the success of projects you have been involved in?

- What influence do you think community ownership models could have on the general public's acceptance of wind turbines in the environment?

- What impact do you think community ownership models will have on wind turbine location in the future?

- What legislative and/or policy changes would be needed to (further) facilitate community ownership?

- What benefits do communities gain from community ownership models?

- Are then any draw-backs for communities as a result of community ownership models being implemented?

- What advantages or disadvantages do you see in community ownership as compared to the corporate model of ownership?

Appendix 4

Information Sheet

Is there an appropriate model of community wind turbine ownership for New Zealand?
INFORMATION SHEET

Who is the researcher?
My name is Jane Pearce and I am a masterate student in the School of Sociology, Social Policy and Social Work at Massey University, Palmerston North, New Zealand. My research seeks to identify an appropriate model for the community ownership of wind turbines in the New Zealand context.

If you have any questions about the research I can be contacted by phone on +64 21 376532 or via email ecoternatives@internet.co.nz. My supervisors can also be contacted; they are:

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What is the research about?
This research is a comparative qualitative study of community ownership models of wind turbine ownership in Denmark, the United Kingdom and Australia with the purpose of identifying an appropriate model of community ownership for the New Zealand situation. In particular this research seeks to identify a model for New Zealand which effectively combines the social justice and environmental potential of community ownership. As a result in this research community ownership is primarily taken to mean local ownership by the community of locality, in order to make opportunities for the whole community.

Participant involvement
I would value your participation in this research. Should you agree I would like to interview you by email, telephone or face-to–face as may be appropriate to your location. If the interview is by telephone or face-to-face it will be at a time and place of your choosing. The interview is likely to take up to one and a half hours, and the face-to-face and telephone interviews will, with your written permission be audio taped. Participants will be offered the opportunity to review the audio tape transcripts in order to make corrections.

Participant's Rights
I am seeking your participation in this research on a voluntary basis and you have the right to decline to take part. If you decide to participate, you may at any time during your participation:
• decline to answer any particular question;
• withdraw from the study;
• ask any questions about the study;
• request that specific information you have provided not be used in the context of the research;
• ask for the audio tape to be turned off at any time during the interview.

I would like your permission to attribute your responses to you in the written proceedings that arise from this research (including the thesis or any future academic publications). All participants will, on completion, be sent a summary of the findings of the research.

"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research.
If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Ethics & Equity), telephone 06 350 5249, email humanethics@massey.ac.nz".

Appendix 5

Consent Form

Is there an appropriate model of community wind turbine ownership for New Zealand?

PARTICIPANT CONSENT FORM

This consent form will be held for a period of five (5) years
I have read the Information Sheet and have had the details of the study explained to me.
My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.
I understand that face-to-face and telephone interviews will be audio taped.
I agree to participate in this study under the conditions set out in the Information Sheet.
Signature:
Date:
Full Name - printed

Appendix 6

Wind Turbine Images

Figure A6.1 Tararua 1 and 3

(Source: personal photograph)

Figure A6.2 Tararua 3, 3MW Turbines

(Source: personal photograph)

Figure A6.3 Windflow 500 Turbine

(Source: personal photograph)

Figure A6.4 Tararua 1

(Source: personal photograph)

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