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Wind Farming and the Not-in-My-Backyard Syndrome: A Literature Review Regarding Australia's Challenge in Relation to Climate Change and CO₂ Emissions

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1. Introduction

Let me begin with a personal note. When several Australian newspapers reported about people objecting to the establishment of wind farms in rural and regional Australia, the Not-in-my-Backyard syndrome (NIMBYism) entered my thoughts. Knowing that Australians were emitting more than reasonable amounts¹ of greenhouse gasses into the atmosphere, this literature review was started. It is the result of trying to understand the objections to wind farming. I must admit that I like the turbines, their imposing height, the way they enhance the landscape, and their capacity to produce electricity. In 2002, I was standing under a turbine on the Isle of Fanø in Denmark, it was noisy but not overwhelming, I was in awe, admired a manmade product fitting perfectly into the landscape. Reading years later the objections to wind farming in Australia triggered concern and an interest into researching NIMBYism.

According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (2009, pp. 1-5) climate change is the greatest ecological, economic and social challenge of our time. Globally, CO₂ emissions, temperature and sea levels are rising faster than expected and average temperatures are increasing (CSIRO, 2009, p. 3). These trends are recorded on all continents and in the ocean. "Since the Industrial Revolution global CO₂ concentration has risen by 37%" which "is mainly due to fossil-fuel use and land-use change" (CSIRO, 2009: p. 5). CO₂ is a contributing factor in the enhanced greenhouse effect which is resulting in climate change.

Approximately 25% of the CO₂ emitted in the atmosphere is absorbed by the ocean and another 25% is absorbed by the natural environment on land. In water, CO₂ makes the oceans more acidic. Ocean acidification interferes with the formation of shells and corals, and has far reaching implications for the health and productivity of the world's oceans (CSIRO, 2009, p. 5).

The CSIRO also finds that "the likelihood of observed warming being due to natural causes alone is less than 5%" (p. 5). And they continue:

¹ What constitutes a reasonable amount?

Evidence of human influence also has been detected in ocean warming, sea-level rise, continental-average temperatures, temperature extremes and wind patterns. This conclusion is consistent with the observed melting of glaciers and ice sheets (CSIRO, 2009, p. 5).

One of the solutions to increased greenhouse gas emissions is the renewable energy of wind power. Wind power is currently the most rapidly growing energy source in the world (Acciona Energy, 2006; BTM Consult ApS, 2009; Firestone, Kempton, Krueger & Loper, 2005, p. 75; Liebmann, 2003, p. 4; Mercer, 2003, p. 10). Wind farms have been established in many countries to reduce dependence on fossil fuels and, at the same time, to increase the production of renewable energy. Wind turbines can be installed onshore and offshore. In spite of positive effects on the environment, i.e. reducing CO2 emissions (see Section 8.), wind farms have been opposed for environmental reasons: Paradoxically, according to Lothian (2008, p. 196), “while addressing one environmental concern, the system is being opposed because of another environmental concern, namely the perceived negative impact on the environment, particularly on landscape quality”. There is, however, a strong commitment of many countries to increase the share of renewable energy and this has resulted in a significant increase in the number of wind turbines. The World Wind Energy Association (WWEA) provides a table showing the added capacity of approximately six months (end of 2009 to June 2010):

Position	Country	Total capacity end 2009 (MW)	Added capacity June 2010 (MW)	Total capacity June 2010 (MW)
1	USA	35.159	1.200	36.300
2	China	26.010	7.800	33.800
3	Germany	25.777	660	26.400
4	Spain	19.149	400	19.500
5	India	10.925	1.200	12.100
6	Italy	4.850	450	5.300
7	France	4.521	500	5.000
8	UK	4.092	500	4.600
9	Portugal	3.535	230	3.800
10	Denmark	3.497	190	3.700
Rest of the world		21.698	2.870	24.500
Total		159.213	16.000	175.000

www.wwindea.org/home/index2.php?option=com_jce&task=popup&img=imag

Table 1. Wind Power Worldwide June 2010

The table demonstrates that the use of wind power is on the increase overall. The changes in the table refer to a time of approximately six months. Looking at the near past, in the 1990s, Germany had the fastest growth in the industry, followed by Spain, Denmark and India (European Commission, 1997, table 2.2). The German wind farming industry in 2000 was the second largest in the world (Johnson & Jacobsson, 2000, p. 2), generating the highest amount of wind powered energy in the world (Nelson, 2005, p. 8; Reeves & Beck, 2003, p. 9; Rodriguez et al., 2002, p. 1089). The growing trend for Germany has continued (Macintosh & Downie, 2006, p. 1), however, Table 1 demonstrates that China, the United States of America and India have overtaken Germany during the last (at least) six months.

This literature review relates to wind farms on land and is written from an Australian perspective, including some international comparison. In 2010, four projects (worth 477 MW) were abandoned or suspended in South Australia, Victoria, New South Wales, and in Tasmania² (Wikipedia; Clean Energy Australia 2010; Clarke, 2008/2010, p. 16). The planning and siting of wind farms often create conflict in the local population. For that reason a look at newspaper articles should set the scene regarding the public's attitudes towards wind turbines. Problems relating to biodiversity (birds and bats are being killed); reliability (wind power can only be used as intermittent source of power); economy (wind turbines are costly but contribute very little to the reduction of CO2); economy (wind power is not cost-effective); health (the noise of turbines has adverse affects on residents' health); and the aesthetics of the environment will be discussed. Characteristics of NIMBYism will be studied, and issues that may help to find a solution to the polarised debate will be explored. In order to make sense of the disputes, the connection to, and identification with place will be looked at, and improved collaboration between the public, developers and governments will be considered; so will be trust and social distrust of the community towards governments. Scientific arguments regarding climate change and CO2 emissions will be used to strengthen the claim that changes are necessary. It will be argued that several non-rational theories (relating here to biodiversity, reliability of wind energy, economic costs, health, aesthetics of the environment) are the basis of NIMBYism. These non-rational concepts have very rational consequences, i.e. abandonment or suspension of the project. The discussion around NIMBYism and wind farming is not new but this chapter should add weight to arguments in support of the development of wind farming.

2. Findings

2.1 The Australian wind power industry – Some facts

In 2008/09 Australia produced 438 million tonnes (Mt) of raw black coal, 334 Mt of black coal was available for the domestic use and for export (2008 Australian Coal). The CSIRO 2003-2011 finds that

...coal is Australia's largest export and a major contributor to the national economy. It is the primary fuel for power generation worldwide and provides more than 80% of Australia's electricity supply (CSIRO 2003-2011).

Coal is, however, a major contributor to the world's greenhouse gas emissions. According to the CSIRO 2003-2011, current power technologies account for more than one third of Australia's emissions alone. This means that, on the one hand, the profitable coal export industry has to be considered and, on the other hand, the environment. Taking a long term view, the risk of further CO2 pollution is high and our options are limited. Clarke, who has researched climate change and Australia's wind energy projects for many years, contemplates the belief of many that 'Australia can't make any difference' and summarises their negative attitude as follows:

Australia only produces about 1.5% of the world's greenhouse gasses. If we were to cut our emissions to nothing tomorrow, it would make very little difference to the world. Therefore we would be foolish to risk crippling our economy (Clarke, 2008, p. 8).

Bond (2009) is more specific than the CSIRO regarding the production of electricity and finds that in 2006/2007, "83% of Australia's electricity is produced using coal" (p. 2).

²Please refer to Section 3 for some examples.

Australia “is the rich world’s worst per capita greenhouse gas emitter due to a heavy reliance on ageing coal-fired power stations for electricity generation” (Taylor & Grubel, 9.7.2011, p.1). This is a worrying aspect. Data published by the United Nations Statistics Division (2008a) on carbon dioxide emission shows that Australia is in sixteenth position when the percentage of global total CO₂ emission is considered: as a nation, 399,219.00 metric tonnes of carbon dioxide are emitted annually. Per capita Australians emit 18.94 tonnes of CO₂ per capita (United Nations Statistics Division, 2008b).

Despite challenges, the present Australian Federal Government is committed to generate 20% of Australia’s electricity from renewable energy by the year 2020 for a transition to a low-carbon economy (Combet, 2010, pp. 1-4). Interestingly, Australia was listed twenty third in the world in 2004-2005 for capacity of wind generation (Nelson, 2005, p. 8), but it was the first country to implement a mandatory requirement of energy retainers (MRET), i.e. that there be a certain amount of renewable energy target (Kann, 2009, p. 1; Macintosh & Downie, 2006, p. 1; Mercer, 2003, p. 17; Nelson, 2005, p. 3). Since the inception of MRET, wind power has been the fastest growing source of energy in Australia (Macintosh & Downie, 2006, p. 1; Nelson, 2005, p. 3). Wind power accounts for 16% of the renewable energy market in Australia (Clean Energy Council, 2009), but only 1.3% of its electricity comes from wind power (IEA, 2009, p. 79). Australia has various state based national incentive programs to promote wind energy, there is, for instance, the Green Power national accreditation program, and there are initiatives of the Department of Climate Change (IEA, 2008, pp. 79-84). According to the International Energy Agency, in 2008:

- the capacity of Australian wind turbines was 1,306 MW,
- the average number of Australian households powered by wind energy was 487,537,
- the number of wind energy projects with two or more turbines was 37,
- the annual CO₂ emissions displaced by wind energy were 3,530,744 tonnes per year; equivalent to 784,610 cars been taken off the road per year,
- total capital investment was A\$2.207 billion Agency (IEA, 2009, p. 81).

Since 1997, Australian installed wind power has grown by 75% (Clarke, 2008, p. 4) which implies that things are moving into the direction of renewable, clean energy. Garnaut (Update 2011a) recommends that “Australia should be ready to calibrate its emissions reductions proportionately to the global mitigation effort” (p. 13) and that “low emissions technology” should be a vital part of the mitigation effort (p. 39). And Diesendorf (2003/2004), promoting Australian sustainable energy for about twenty-five years, argues that

... in replacing a coal-fired power station with a mix of energy efficiency, wind power, bioenergy and gas, the economic savings from energy efficiency will be so large that they could pay for the additional costs of renewable energy (p. 2).

Australia is a land of wide open spaces, its size is 7.7 million square kilometres, its population is 22,650,000, and in 2001, almost 85% of the population lived within 50 km of the coast line (Australian Bureau of Statistics, 2006). The inside of the country is vast, but this vastness has disadvantages and can, according to Clarke (2010/2011, pp. 4-5), present limits to the development of wind farms:

- The size and cost of cranes that are used for turbine erection,
- Size and weight of components that must be transported by road,
- Potential for aviation and radar interference,
- Material fatigue.

Clarke (2009) also considers the lack of electricity transmission lines, and anticipates a "shortage of working capital due to the financial break-down" (p. 3). Despite these impediments, it is argued here that 16% wind power representing renewable energy could be improved and that the 1.3% of electricity produced from wind power should be increased. The international comparison regarding electricity produced by wind power is as follows: Denmark produces 19%, Spain and Portugal 9%, Germany 6%, Ireland 6%, USA 1.9% (IEA, 2009, p. 10). What are the barriers in Australia to develop and to use to a greater extend facilities that can provide clean, renewable energy? In 2010 four projects, worth 477 MW of wind power, were abandoned or suspended. Here are some examples of challenges developers and governments face when planning a wind farm.

3. Case studies – Some challenges when wind farming is considered in Australia

In 2008, wind energy provided 487,537 Australian households with electricity, which presented 1.3% of national electric demand (IEA, 2009, p. 79), however, as mentioned earlier, more than 80% of electricity (CSIRO) or, more specifically, 83% (Bond (2009, p. 2) was coal-fired. Let's look at some of the challenges associated with the development of wind energy projects.

In February 2009 Acciona Energy began generating green power in Waubra (approximately 150 km west-north-west of Melbourne, the capital city of the State of Victoria, and 35 km north-west of Ballarat, Victoria). The wind farm consists of 128 turbines of 1.5MW, the installed capacity is 192MW, offsetting 635,000 tonnes of CO₂-e annually (Acciona Project Snapshot). Acciona then wanted to establish another wind farm, Waubra North, close to the township of Evansford. But some challenges emerged: According to Radical Green Watch (February 13, 2010), the Pyreness Landscape Guardians organised a meeting in early 2010. This meeting "brought together sixty wind farm opponents from across the state". At the meeting a petition was signed requesting a moratorium on wind farms until health studies were undertaken. A representative of Acciona, present at that meeting, stated that "the company was still conducting investigations of the site at Evansford". Acciona (Newsletter, June 15, 2011) announced that "its early feasibility work on the site at Waubra North ...has indicated a wind farm in that location would not be viable"(p. 1). The company had undertaken investigations in relation to the environment, flora, fauna and, most importantly, wind resource.

The further north you travel from Waubra we found the wind resource to be less viable, primarily because of different topography (Acciona Newsletter, June 15, 2011, p. 1).

Interesting here are some political connotations. According to Courtice (July 30, 2011), a former member of the Liberal Party sits on the board of the anti-wind power Waubra Foundation, and a businessman, who was involved in oil, gas and mineral exploration companies, set up the foundation. Did Acciona Energy know about these powerful opponents?

Some other issues are worth noting because they relate to issues of NIMBYism. Firstly, there is the deliberate creation of "fear, uncertainty and doubt" (FUD) (Courtice, July 30, 2011) by the opponents of wind energy. FUD undermine an objective debate. Secondly, here are some facts about Acciona and its involvement in the local community of Waubra: Waubra has, according to information on the net, a population of 494, it is not far away from Melbourne and Ballarat, and its football team, the Waubra Kangaroos, has won several

Australian rule football finals. Expanding on these limited facts, it can be assumed that the Waubra wind farm provides employment for local residents. Acciona is also contributing annually \$64,000 to a Community Benefit Fund (\$500 per turbine per annum) and, interestingly, arrangements have been made for post 2035, when the Waubra wind farm ceases to operate: 5% of the Community Benefit Funds are allocated "to provide the community with ongoing project support" (Acciona Newsletter, June 15, 2011). Further, Acciona is involved in social events, such as the Waubra Corporate Footy Day, and is producing a quarterly newsletter, delivered to local residents and available at local shops and offices of the Shire and the City of Ballarat. All of this indicates that Acciona Energy is contributing in a positive way to this regional society (employment, community funds, social events), however, local residents "did not want more Acciona in the district. I think it is a huge win for the local community", and "it wasn't a good idea in the first place" (Australian Broadcasting Corporation, Ballarat, May 25, 2011).

I was not able to find out whether the "sixty opponents to wind farms from across the state" (Radical Green Watch, February 13, 2010) or the two politically influential executives played a part in Acciona's decision to abandon the Waubra North project, however, the remarks by residents are underpinned by NIMBYism.

Another case, also relating to Acciona, further demonstrates the force of NIMBYism. In an article entitled "Man vs Wind farm", Impey (ABC South East SA, June 22, 2011, pp. 1-3) reports about a decision that "has rocked the renewable energy industry": courts have ruled in favour of a man who lodged an appeal against the development of a proposed wind farm in Allendale East on the basis of visual amenity.

In a landmark ruling Eight Mile Creek dairy farmer Richard Paltridge lodged an appeal with the State's Environment Resources and Development Court against the decision by the Grant District Council's independent planning assessors to go ahead with a 46-turbine project (Impey, ABC South East SA, June 22, 2011, p. 1)

This project was meant to deliver substantial economic and environmental benefits to Mount Gambier and the South East region of South Australia. The A\$175 million investment by Acciona was expected to generate fifty construction jobs and eleven highly-specialist full-time jobs. It was expected that the forty-six turbine project would meet the needs of about 43,000 households and reduce carbon dioxide emissions by 181,568 tonnes annually (The Border Watch, June 23, 2011, p. 3). The Grant District executive officer "was surprised ... given the company's extensive public consultation, that was the most comprehensive of any developer in the past 10 years". This officer also mentioned that he was not aware "of any other wind farm development that has been refused through the courts due to visual amenity". In contrast to these remarks, a member of the Concerned Residents Group, which had been formed to oppose the wind farm, stated that "many residents and adjoining landholders were celebrating the ruling". While claiming that the group was not against wind farms, "... multinational companies should not be allowed to place these farms 'willy-nilly'" (The Border Watch, June 23, 2011, p. 3).

The two news items, broadcast by the ABC (Australian Broadcasting Corporation), and the article in The Border Watch demonstrate the rational consequences of NIMBYism. The Clean Energy Council policy manager finds that "the ruling was subjective", that "visual amenity is subjective [and that] they rejected it purely on that basis" (Impey, ABC South East SA, June 22, 2011, p. 1). The argument of subjectivity is substantiated by Finlay-Jones and Kouzmin (2004) who find that "visual amenity is a subjective matter", that it is entirely dependent on the experience of individuals and that "acceptance ... increases with time" (p. 3). To take the

analysis a little further, visual amenity, the destruction of the view, the aesthetics of the landscape can be related to sense of place (place attachment and place identity to be discussed in Section 7).

Another very interesting issue emerged in relation to the facilitation of wind turbines:

The proposed 26-turbine wind farm at Glen Innes that was the first to be approved in New South Wales's six newly created 'wind precincts' has sparked legal action against the government. Neighbouring landowners are not happy with the turbine set back distances from their properties and that the income of the participating landowners is not shared with the affected neighbouring properties. Three local families are challenging Ms Kenneally's decision in the NSW Land and Environment Court (Infigen, April 8, 2011).

The issue of "income of the participating landowners" not being "shared with the affected neighbouring properties" must cause a great deal of angst amongst those landowners who are leasing their property to developers of clean, renewable energy.

NIMBYism in relation to wind farming³ is encouraged by proponents of the coal industry. While the present Australian government (Labor, The Greens, three independents) are committed to create a more sustainable environment, a survey of wind companies commissioned by the Clean Energy Council in 2010, found that between 50 to 70% of proposed wind farms would be abandoned if the Coalition (Liberal Party, National Party) would pursue its policies. According to the National Times (February 22, 2011), the Coalition has promised to support the reduction of CO2 emissions by 20% by 2020, however, "their anti-wind farm policy threatens to do the opposite". This finding cannot be when underestimated NIMBYism is considered.

4. The pervasiveness of the Not-in-my-Backyard syndrome (NIMBYism)

A short overview of national and international newspapers⁴ will demonstrate the all-pervasiveness of NIMBYism: Kagkelidon (April 13, 2007) reports from Greece: "Serifos island opposes gigantic wind park plans". Siegel (November 27, 2007) also reports about the island of Serifos: "NIMBYism – Global obstacle to a renewable energy future". Howden (June 12, 2007) writes about "Conservationists fight to keep wind farms off Skyros". Russel (January 1, 2008) looks at the situation in Great Britain: "Local planning logjams are preventing renewable power projects being given the green light, research reveals two out of three applications for onshore wind farms are being rejected". He further comments that "Britain could fulfil its full potential for land-based wind power if the proposals currently going through the planning system were built". Walker (January 19, 2011) considers Great Britain's *Localism agenda* which seems to oppose low-carbon strategy: "Wind industry warns Localism bill could spark yet more planning delays for new renewable energy projects". And Woods discusses conflicting environmental visions of the rural:

The proposal to construct the 39 turbine power station provoked considerable controversy from its announcement in early 2000. By the time that the application was approved by the local planning authority in July 2001, it had generated a public debate that split communities, political parties and pressure groups, and prompted public meetings, demonstrations, petitions and letters to the press (Woods, 2003, p. 271).

³For further discussion see Sections 5 and 6.

⁴An internet search regarding Australia and NIMBYism established 659,000 entries on the web but only two books in our library; these two books deal with the NIMBYism and waste disposal.

Attitudes towards wind turbines are similar in the United States: Lynley (May 24, 2011) reports “Maine wind farm could be the latest ‘not in my backyard’ casualty”. The establishment of wind farms are being delayed (Wisconsin) or rejected (Connecticut). “Wind farm? Not off my back porch” is an interesting article by Schoetz (March 30, 2007) dealing with a “major battle in the politics of alternative energy [which] has moved to a final phase in Washington: Senator Edward Kennedy with a waterfront view and a bone to pick”. But Seelye wrote (April 28, 2010) “after nine years of regulatory review, the federal government gave the green light to the nation’s first offshore wind farm, a fiercely contested project off the coast of Cape Cod” (vicinity of the Kennedy property).

NIMBYism could also be detected in New Zealand: Cross (July 5, 2010) reports about “wind farms and the NIMBY Phenomenon”, that New Zealand’s “climate and geography lend themselves to the efficient use of wind power”, however, “public objections to wind farm development and Environment Court rulings highlight some controversial issues associated with the modern energy source”.

Objections to the establishment of wind turbines are very similar across the world and in Australia: “NIMBYs ‘a threat to proper planning’” and “‘Not in my backyard’ sentiments pose one of the biggest obstacles to good planning and infrastructure development” writes Hurst (March 17, 2011). Interesting are the comments by Ryder (April 30, 2011): “I may have to buy a new filing cabinet to record all the events people claim will decimate their property values”. And he continues:

One family attracted media attention by claiming a wind farm on distant hills would destroy every thing they had worked all their young lives for. The views of wind turbines waving in the breeze would kill their property’s value. What about our property rights, they said (Ryder, April 30, 2011).

Jopston (April 2, 2010) argues “Wind farm approval blows town apart” and “Tilting at windmills: why families are at war”; and Strong (May 22, 2010) reflects on “Towns split on which way the wind blows”. These stories are about residents in rural Australian communities who object to the establishment of wind farms in their area. Clarke (2010/2011) finds that the anti-power-movement could present a threat to wind power. He argues:

While it is not strong and the NIMBY principle ... is involved, it does have some justification and some potential to harm the industry. There is at least anecdotal evidence that a few people’s health may be adversely affected by sound and infrasound from turbines. As there seems to be no known mechanism for the health effects, it seems likely that there is a large psychogenic factor involved (p. 2).

How can these strong objections towards wind farming, which produces clean, renewable energy, be explained? Involved in the debate are non-rational concerns, which are produced by anti-wind farm proponents by deliberately creating fears, uncertainty and doubt (FUD) (Courtice, July 30, 2011). The practical consequences of FUD are suspension or abandonment of wind energy projects. There are also the non-rational concerns regarding place attachment and place identity. The arguments presented in different newspapers are sensationalised⁵, nevertheless, they capture the attitudes of local residents. In order to try and better understand NIMBYism, here is a look at its characteristics.

⁵ Qualitative research (discussions, focus groups) may have produced a different outcome.

5. Characteristics of the Not-in-my-Backyard syndrome (NIMBYism)

NIMBYism is defined by Wolsink (2006) as “an attitude ascribed to persons who object to the siting of something they regard as detrimental or hazardous in their own neighbourhood, while by implication raising no such objections to similar developments elsewhere” (p. 86). NIMBYism can refer to the establishment of nuclear power plants, nuclear waste or general waste disposal, housing the underprivileged, or to racism. Here NIMBYism is related to wind farming in Australia, referring to public opposition to unwanted local developments. NIMBYism “is not new, but it has never been as pervasive and so quickly ignited as today”, it is “a triumph of self-interest over principle” (Offor, 2002, p. 2). Offor contemplates on “how quickly one disgruntled landowner appears to become a major campaign with a ground swell of support that could derail an entire project” (p. 2). An insight into the development of NIMBYism may provide an understanding why it is such a powerful tool in opposing something that has potentially very positive effects.

Futrell (cited in Glickel, 2011) argues that true NIMBYism reactions include a “shift in awareness based on a sense of injustice and obligation to act”. Freudenberg and Pastor (also cited in Glickel, 2011) find that three theories can explain NIMBYism in response to perceived or actual risks:

- The community is either ignorant or irrational, unwilling to accept any risk for the benefit of society: Proponents of this theory conclude that the public is uninformed and thus unreasonable. This argument, however, does not recognise that issues of uncertainty will always be a part of any assessment dealing with impacts on the natural world; experts and residents have to consider the same principles of assessment, including uncertainty.
- The community is selfish: The concept of public selfishness is embedded in the free-enterprise economic model of a market society; it is based on the assumption that it is rational for individuals to look out for their own interests. Scholars now have the difficult task to determine which self-interested attitudes can be justified and which can not.
- The community is prudent: Recent research has recognised some public opposition as valuable to an impact assessment: Organised protests challenging scientific assessment can reveal elements of the bigger picture scientists may otherwise not consider. Going beyond either blaming or understanding specific opposing views can lead to an understanding of the broader system that creates opposition in the first place.

The characteristics of NIMBYism often overlap (Glickel, 2011). Some further explanation and support of the syndrome is provided by Esaiasson (2010). He finds that in the 1980s the concept of NIMBYism gained importance among frustrated politicians and developers who argued that “narrow-minded citizens were a hindrance for societal development” (p. 27). At that time, the “simplistic NIMBYism did not take into account the needs and values of local communities” (p. 27). Esaiasson finds that “self-interest and local concerns are important in relation to individuals’ responses to planned facility sitings” and that “the basic idea of NIMBYism should be part of our understanding of the complexities of public facility sitings” (p. 1). The author concludes that “without informed consent of affected individuals, the decision to site a public facility is an expression of contested legitimate power” (Mansbridge cited in Esaiasson, 2010, p. 28). This may be so, but somehow the civic good has to be fitted into the equation. Gibson (2005) raises the issue of the civic good and is critical of NIMBYism. The traditional view of NIMBYism is an “opposition between the

rational/civic interest, embodied by public authorities, and the irrational/self-interest, embodied by local opponents", it "reduces land-use disputes to a moral struggle between the two groups" (Gibson, 2005, p. 385). As a consequence:

... more and more local opponents to much needed but controversial facilities... are successful in killing ... important projects. What you face as a state or industrial planner, then, is not just an isolated case of NIMBY opposition, but rather an accelerating NIMBY syndrome – that is, an emotional, irrational, and systematic distrust of public and corporate expertise that threatens to undermine the state's ability to solve important environmental and social problems (Gibson, 2005, p. 381).

Trust or social distrust will be discussed later in this chapter. Here are, at first, the most cited arguments against wind farming in relation to NIMBYism.

6. Most common disputes against wind farming associated with NIMBYism

6.1 Biodiversity

The threat to biodiversity may not be a significant factor for land owners to object to the establishment of a wind farm on or near their property, however, strong movements exist protecting the environment and endangered species (Clarke, 2008; Macintosh & Downie, 2006). Danger to birds and bats are often the cause of protest against wind power. An article by Maris and Fairless (2007) states that each wind turbine kills an average of 4.27 birds per year. But Macintosh and Downie (2006) find that "all available evidence indicates that, provided wind farms are located in appropriate areas, the risks to biodiversity are likely to be small" (p.22). Taking the overseas figures as benchmark they determine that approximately 2,550 birds and 2,550 bats are being killed each year in Australia as a consequence of wind turbine collisions⁶, "however, these risks should be put into perspective as there are numerous other issues that pose a far greater threat to birds and bats than wind farms" (p. 22).

6.2 Reliability of wind power

Reliability of wind energy is another strong argument against the development of wind turbines. This issue, like the previous one, may not be of direct concern to property owners, but in the bigger scheme of things, i.e. promoting fossil-fuel electricity, as well as manipulating public opinion, it is an important issue. The Citizens Electoral Council of Australia (7.6.2010) claims that wind 'power' is a fraud: The article finds that "while the average high-income, inner-city Green voter voluntarily pays a premium for their 'green' electricity", current data from the Australian Energy Market Operator shows that "the fabulous windmills that are conveniently well out of their urban eyesight and earshot are usually producing only a fraction of their installed capacity". Here is their argument:

Wind farms across New South Wales, Victoria, Tasmania and South Australia, have a theoretical 1,609MW capacity but electricity generation data shows that the wind power generated from 13th to 20th May [2010] for much of the time was next to zero. Why? Simply, the power won't flow if the wind doesn't blow. Wind power proponents claim that this doesn't matter because if the wind is not blowing in one location, it will be blowing elsewhere. However, the actual power generation data shows this to be one big

⁶ Macintosh and Downie (2006) provide a comparison: an estimated 8.5 million birds died each year in Queensland alone in the late 1990s as a result of land clearing.

lie. Weather systems often extend over 1,000 km and no wind means no power (Citizens Electoral Council of Australia, 7.6.2010).

This critique captures the sentiments of many residents in rural areas. An article by Leaske (March 25, 2010) points out that "the production figures of individual wind farms have to be treated with caution as output can vary sharply because of breakdowns. The revelation that so many wind farms are performing well below par ... will reinforce the view of objectors who believe that many turbines generate too little power to justify their visual impact." Macintosh and Downie (2006) look at the issue from a more pragmatic point of view, suggesting that wind energy is efficient because "the variability associated with wind energy is managed by the measures that are ... in place to address fluctuations in the supply of, and demand for, electricity" (p. 12). Diesendorf (2003/2004) confirms this: he was able to refute the arguments that wind power can only be used as an intermittent source of power more than thirty years ago: "... wind power, like coal power, is a partially reliable source of power, ... wind power has 'capacity credit'⁷" (p. 2):

... large blocks of wind power, with rapid-response back-up either from hydro or gas turbines and slow-response from intermediate load stations, can provide reliable base-load power and substitute for some coal power. This is not just theory, but is actually happening in countries that have made a major commitment to wind generation. Last year Denmark generated 18%⁸ of its electricity from wind power and still plans to increase this substantially (Diesendorf, 2003/2004, p. 3).

6.3 The economic costs of wind farming

Arguments that wind power is not cost effective often strengthen NIMBYism, "wind farms are expensive and require government subsidies" (Government Victoria, 2007, p. 8). Government Victoria (2007) finds that wind farms are becoming increasingly cost effective, however, since the renewable energy industry is only just developing, "government assistance is necessary to allow the industry to improve new technologies and become commercially competitive" (p. 8). Clarke (2010/2011, pp. 18-19) calculates the cost of wind power, based on official data available from Australian wind farms: to produce electricity by wind power costs between A\$53 and A\$76 per MWh. Clarke then compares this to earlier data from a US congressional report: "costs of electricity in the USA (per MWh) generated by wind is A\$67, and generated by pulverised coal A\$64" (p. 19). Macintosh and Downie (2006) find that comparison between wind and other sources of energy is difficult because of the cost profiles associated with wind developments.

The most important costs are upfront capital costs, the operating costs are relatively low. ... Most of the data indicate that wind energy is one of the most cost efficient sources of renewable energy and that, when the costs associated with pollution are factored in, it is competitive with coal- and gas-fired power stations (Macintosh & Downie, 2006, p. 3)

Bond (2009) argues that wind energy is "an economically viable form of renewable energy that effectively displaces fossil-fuel electricity generation" (p. 28). This position and an agreement that wind energy can help lower CO2 emissions is supported by various scientists, economists, governments and concerned individuals (i.e. Diesendorf, 2003/2004, 2006; Macintosh and Downie, 2006; Government of Victoria, 2007; Krohn et al., 2009; Bond,

⁷ Fuel saving with a need for back-up.

⁸ Australia's contribution was 1.3% in 2007 (International Energy Agency (2009).

2009; Clarke, 2010/2011; Combet, 2010; Gillard, 2011). Interestingly, a study by Bond (2009) of residents in two townships in Western Australia determined that both groups agreed that wind farms would be a “boost to tourism / local economy” (p. 23).

6.4 Health issues

There is rapidly growing world-wide professional realisation that reported health issues in people living close to established wind farms have commonality and substance. Wind energy proponents dismiss this evidence as being symptomatic of ‘NIMBYism’ and claim that peer reviewed studies have not conclusively linked these health issues to wind turbines, while medical professionals call for urgent scientific research to establish the facts. The concern is that development approvals are being fast tracked ahead of the outcomes of research (Birrell, n.d. p. 1).

Residents living close or relatively close to wind turbines have raised several health issues, including “headaches, tinnitus, dizziness, nausea and sleep disturbance”, and “elevated blood pressure” (Clarke, 2010/2011, p. 5). The most prevalent issue is sleep deprivation caused by the noise of turbines (Government Victoria, 2007; Kamperman & James, 2008 a, b; NHMRC, 2010; Clarke, 2010/2011). Studies undertaken by Kamperman and James (2008a) show “significant health effects associated with living in the vicinity of industrial grade wind turbines” (p. 1). Their findings are based on data from industrial wind turbine developments and their findings show “that some residents living as far as 3 km from a wind farm complain of sleep disturbance from the noise”, and “that many residents living only 300 m from the wind farm are experiencing major sleep disruption and some serious medical problems from night-time wind turbine noise” (p. 4). Kamperman and James (2008b) propose sound limits that are “standardised and available on all sound level meters”, i.e. the “C-weighting or dBC” (pp. 8-10).

Macintosh and Downie (2006, pp. 19-20) find that modern wind turbines create very little noise. At around 40 m the noise created by a single turbine is the equivalent of conversational speech, which is around 50 to 60 decibels (adjusted using an A filter or the A scale) (dBA). “A wind farm comprising of 10 turbines would create a sound pressure of 35 to 45 dBA at 350 m if the wind was flowing from the turbine to the observer” (p. 20). The authors conclude that wind turbines are not a significant cause of noise pollution.

The NHMRC (2010) made the following statement: “Based on current evidence, it can be concluded that wind turbines do not pose a threat to health if planning guidelines are followed” (p. 6). But the Senate (Commonwealth of Australia, 2011) conducted an inquiry into *The Social and Economic Impact of Rural Wind Farms*, and it was recommended that “any adverse health effects for people living in close proximity to wind farms” as well as “concerns over the excessive noise and vibrations emitted by wind farms” (p. 1) should be determined because “the Commonwealth has responsibility for certain aspects of the development of wind farms” (p. 3).

Overall the literature shows that, at this point in time, there is no scientific evidence “indicating a direct link between wind turbines and ill health”, and that “there is no known mechanism by which turbines could make people ill” (Clarke, 2010/2011, p. 2).

6.5 Aesthetics of the environment

The destruction of the aesthetic view of the environment is the most cited complaint against wind farming, it interlinks with people’s concern that their property value will decrease if

the view is destroyed (Sims and Dent, 2007). But the visual amenity, the aesthetics of the environment, "is a subjective matter, dependent upon the experience and beliefs of the individual" (Gipe cited in Finlay-Jones & Kouzmin, 2004, p. 3). Can this bias be counter-argued by a rational point of view? Bond (2009) claims that overseas studies show no statistical evidence that wind turbines within an 8 to 12 km radius of a home have a negative impact on price. Macintosh and Downie (2006) find:

...the available evidence indicates that wind farm developments are unlikely to have a significant negative impact on property price. Initial concerns about visual ... impacts could temporarily reduce prices, but these affects are likely to be small and dissipate quickly (p. 27).

Arguments regarding the visual impact are closely linked to NIMBYism. Wind farms face public opposition during the planning process (Johansson & Laike, 2007; Danish Wind Industry, 2007; Macintosh & Downie, 2006; Bond, 2009; Clarke, 2010/11; Government Victoria, 2007) and here are some examples of NIMBYism, starting with a case in point from South Australia. Lothian (2008) conducted a survey of three hundred and eleven participants and found that

.... wind farms generally have a negative effect on landscapes of higher scenic quality but a positive effect on landscapes of lower scenic quality. The negative visual effects of a wind farm did not decrease with distance (p. 196).

Apart from having conducted his own research, Lothian (2008, pp. 197-207) also cites surveys regarding proposed wind farms in different countries: (1) Residents in North Carolina and Scotland found that spoiling the view or scenery was of greatest concern. (2) In Denmark, Germany and Sweden, local residents are generally supportive of wind farms, but there are some publications which describe the destruction of scenic beauty as a 'catastrophe'. (3) On the Isle of Wight opponents argued that the cause of the problem is based on conflicting national policies: renewable energy targets advocating wind farms contradict policies to preserve, enhance and protect the landscapes from major developments.

Johansson and Laike (2007, pp. 435-451) surveyed eighty people in Sweden regarding the "intention to respond to [to oppose] local wind turbines" and "the role of attitudes and visual perception" (p. 435). These researchers found that the intention to oppose was based on people's attitude regarding *perceived* (emphasis added) effects of wind turbines on landscape aesthetics. Interestingly, opinions regarding "the effects of wind turbines on people's daily quality of life were of minor importance" (p. 435). The authors conclude that it is important for "developers to convince the public that turbines can be integrated into the landscape without threatening the beauty and the recreational value of natural and cultural landscapes" (p. 449).

Coleby, Miller and Aspinall (2009) undertook research in the UK to establish the relationship between public opinion on wind power and public participation in turbine site planning. Most of the critiques related to the proximity of wind turbines to respondents' homes, and it was suggested that "the turbines should remain out of sight". Two interesting issues emerged in the study: (1) younger participants are more accepting of wind turbines than older respondents, and (2) city dwellers are more accepting of wind power than people living in rural areas. But all participants wanted "more public input and participation in local land use for wind power" (p. 1).

Bond's (2009) comparative Western Australian study regarding the visual impact of planned wind farms determined that people would "not want to live near a wind farm" and that

they anticipate “to pay 1% to 9% less for their property due to the presence of a wind farm nearby” (p. 1).

The next section will explain reasons for the objections.

7. Two ways to understand objections to wind farms

In order to make sense of the concept of NIMBYism and its practical implications, consideration is given here to attachment to, and identification with place, and to the concept of trust or distrust.

7.1 Place protective action

Devine-Wright (2009, p. 426-441) explains objections to wind farming by taking place protective action into account, by linking the concept of NIMBYism to place attachment and place identity. Place attachment is “the process of attaching oneself to a place and a produce of this process” (Guiliani in Devine-Wright, 2009, p. 427). As product, “place attachment is a positive emotional connection with familiar locations, which can, if disrupted, lead to action, both at individual and collective levels” (Manzo in Devine-Wright, 2009, p. 427). “Place identity refers to ways in which physical and symbolic attributes of certain locations contribute to an individual’s sense of self or identity” (Proshansky et al. in Devine-Wright, 2009, p. 428). Any disruption of place can show “the emotional bond between a person and location” and create feelings of “anxiety and loss”; and it not only affects “the physical aspects of place but also the social networks which are sources of support to individuals” (Fried in Devine-Wright, 2009, p. 428).

7.2 Place-protective action further developed

Hindmarsh (2010, pp. 1-23) picks up the concept of place-protective action, suggesting that place-protection is important to communities targeted by developers and governments to site wind turbines. The major problem regarding wind farm location in Australia is inadequate community engagement. Wind energy presents “the most viable form of renewable energy” (p. 1), but “not enough recognition has been given to conflicts surrounding wind farm sitings” (p. 2). Hindmarsh looks critically at the Australian government’s policies regarding wind farming and planning these sites. The current policy responses encourage an inform – consult – participatory engagement which is not sufficient, the community should have the final decision regarding the establishment of a wind farm, and the method of obtaining consent should be inform – consult – involve – collaborate – empower, with emphasis on collaboration and empowering, giving residents choices. Hindmarsh also proposes facilitating social mapping of local community qualifications and boundaries about wind farm location.

7.3 Social trust and distrust

There is indication in the literature that trust in politicians, policy makers and governments is diminishing (Kasperson, Golding & Tuler, 1992; Offor, 2002; Marquart-Pyatt & Petrzalka, 2008). Kasperson et al. (1992) explain the meaning of trusts, namely social trust is “a person’s expectation that other persons and institutions in a social relationship can be relied upon to act in ways that are competent, predictable, and caring”, and “social distrust is a person’s expectation that other persons and institutions in a social relationship are likely to

act in ways that are incompetent, unpredictable, uncaring, and thus probably inimical" (p. 169). Kasperson et al.'s (1992) research demonstrates that siting of hazardous facilities "have often led to an impasse" because of the public perceptions of risk and overall uncertainty (p. 163). They recommend "risk communication" (p. 162) which should include a needs assessment, risk debate, monitoring and evaluation.

Initiatives based upon the explicit recognition of high social distrust may, through empowerment, risk clarification, and negotiation, ultimately prove to be more effective in the long-term recovery of social trust than approaches that assert that such trust is merited a priori ... (Kasperson et al., 1992, p. 184).

How can we make sense of these arguments and relate them to the rational issue of greenhouse gas emissions? The next section will try and explain.

8. Australia's greenhouse gas emissions – Isn't it time to act?

The three countries which have been the largest drags on the global carbon reduction effort are the three highest per capita emitters amongst the developed countries – Australia, Canada and the United States (Garnaut, 2011b, p. 2).

"Scientific evidence points to increasing risks of serious, irreversible impacts from climate change associated with the business-as-usual attitudes regarding greenhouse gas emissions" (Stern Review, 2006, p. 3). Looking at Australia's CO2 emissions, earlier in this chapter it was established that Australia is in sixteenth position when the percentage of global total CO2 emission is considered (United Nations Statistics Division, 2008 a), emitting 399,219.00 tonnes of carbon dioxide in 2008 (United Nation Statistics Division, 2008a). Also in 2008, Australians emitted 18.94 tonnes of CO2 per capita annually (United Nations Statistics Division, 2008b, p. 1). Australians are "the worst per capita greenhouse gas emitter" (Taylor & Grubel, 9.7.2011, p. 1) of the developed world. And it is projected that the country's CO2 emissions will further rise (CSIRO, 2009; Garnaut, 2011b; Nolan, 2011; Knott, 2011; Chubby, 2011), which is "due mainly to growth in the resources sector" (Garnaut, 2011b, p. 2). Australia is one of the countries most at risk from climate change, partially because of the size of its agricultural sector and long coastline. Garnaut (2011a) urges Australia to follow the recommendations of global communities addressing climate change. Because of the risk factors, the country should "offer to reduce 2020 emissions by 25% in the context of strong international agreement" (Garnaut, 2011a, p. 63).

Bond (2009) looks at the present 83% of electricity which is produced by coal and contemplates "the growing domestic demand which forces investments into clean renewable energy" (p. 2). Looking at the numerous predictions that Australia's greenhouse gas emissions will further increase, what role could wind energy play?

One typical 2MW wind turbine can be expected to produce over 6,000MW hours of electricity each year. If this replaces coal-fired power, the CO2 released into the atmosphere will be reduced by 6,000 tonnes each year; if it replaces oil or gas-fired power, CO2 released each year is reduced by about 3,000 tonnes (Clarke, 2009, p. 4).

Changing progressively from coal- or gas-fired power to wind power would be a positive step when we look at CO2 emissions. And, as mentioned earlier, the present Australian government promotes the reduction of CO2 emissions and has set its sight on 20% of renewable energy by 2020. In practical terms, there should be no difficulty to achieve an even higher goal. Clarke (2010/2011) calculates that "if the best wind resources of Australia were developed at least 90GW of power is possible" (p. 2). Looking at different coastal

regions of Australia, he estimates, that “91,760MW installed capacity, using a capacity factor of 34%, would give an annual electricity generation of 273TWhr which would be greater than the total Australian electricity consumption for the 2006-07 year which was 262TWhr” (Clarke, 2008/2011, p. 3).

Considering the data presented in this chapter, Australia’s CO₂ emissions, Garnaut’s advice, the estimates and evidence provided by Clarke and by Diesendorf that wind power could replace coal-fired electricity and therefore would minimize CO₂ emissions, it is argued that NIMBYism has to be critically assessed.

9. Discussion

Global warming is increasing and there is scientific evidence (CSIRO, 2009) that the present problems are, at least in part, anthropogenic and that CO₂ emissions contribute to global warming. While wind farming has been accepted increasingly in European countries (Damborg, 1997/2003.; Damborg & Krohn, 1998; Johnson & Jacobsson, 2000; Krohn et al, 2009), in Canada and in the United States (Brown, 2000; Firestone et al., 2005), many residents in rural and regional Australia are suspicious (see Diesendorf, 2003/2004; Macintosh & Downie, 2006; Clarke, 2010/2011), questioning the advantages of wind energy and legitimacy of government and developers’ proposals (Davis, 2008; Barr, 2009; Jopson, 2010; Hindmarsh, 2010; Strong, 2010; Ryder, 2011). However, several scientists, environmentalists and (some) governments find that Australia needs wind power (Diesendorf, 2003/2004; Clarke, 2010/2011; Combet, 2010; Gillard, 2011), and that it could produce all of its electricity from wind energy (Clarke, 2008/2011). Nevertheless, NIMBYism is powerful and persisting.

Lothian’s study (2007) finds that negative visual effects, which are one of the main reasons to oppose wind turbines, could be reduced if scenic locations were excluded. This would interlink with claims that NIMBYism should be part of understanding the complexities of public facility sitings (Johansson & Laike, 2007; Esaiasson, 2010; Glickel, 2011). Wanting to understand NIMBYism, some scholars mention issues of social trust and distrust in governments as a major issue when public facilities are planned (Kasperson et al., 1992; Marquart-Pyatt & Petrzela, 2008). Improving or alleviating social distrust is important. Australians are unconvinced of politicians’ promises: elections take place every three years, politicians’ time in office may extend to six years (some times more). Compared to this, citizens tend to plan their lives and places of residence for longer periods of time. Politicians, governments as well as developers have to convince residents in areas of public facility sitings about the advantages of change, i.e. creation of new jobs and reduction of CO₂-e; they have to be honest and visionary and not self-interested and short-sighted, i.e. take into account the residents’ sense of place.

In order to counteract NIMBYism, scholars point out that environmental aims must be balanced (Haggett & Toke, 2006), and that residents must be empowered and be given a decisive voice (Hindmarsh, 2009). Both these concerns can be related to re-thinking NIMBYism (Devine-Wright, 2009), where place attachment and place identity play the most important part. But there is also the notion of the civic good that needs to be taken into consideration. According to Gibson (2005), the civic good can be achieved by (1) publicly funding local political campaigns to promote an issue; (2) persuading local activists to form associations to counteract those organisations which pursue self-interest; (3) promoting critical scholars and community activists to allocate more of their resources to the development and support of non-profit, alternative media institutions, including community newspapers and radio stations (p. 399).

All of the above issues interlink and are important consideration in relation to CO2 emissions and the advancement of wind energy in Australia, but in what way and how much do they help in understanding NIMBYism? Having considered the main characteristics of NIMBYism, it is argued that the syndrome does not have a rational basis, that it is non-rational, and that we need to assess its validity because the rational consequences include the abandonment or suspension of facilities that could present a cleaner, renewable energy future.

In Australia four projects, worth 477MW of wind power, were abandoned or are suspended in 2010. While only some motives for the abandonment or suspension of these projects could be studied⁹, this literature review was triggered by objections of people to wind farming in rural and regional Australia. People's attachment to, and identification with place are powerful arguments when opposing the development of a wind farm. The literature shows that environmental disruption causes concerns which can lead to anxiety. Therefore this chapter looked at the most important concerns (biodiversity, reliability, cost, health, aesthetic of the environment) and challenged them. But it must be mentioned that a literature review has its limitations because people and their personal stories are not given a voice. There is always the possibility that personal stories let a researcher be less critical and more understanding. Despite these shortcomings, three important points remain: (1) Australia needs to reduce its CO2 emissions; (2) wind power is one of the most efficient sources of renewable energy at this point in time and could help achieve this task; (3) NIMBYism in Australia requires further research.

We are confronted here with some rational facts (consequences) and with a sense of non-rationality, which makes it challenging to find a way out of the dilemma. All articles on NIMBYism state that improved communication between governments, developers and the public is vital. Hindmarsh (2010) provides some directives how this could be achieved, namely greater empowerment of residents in areas where wind turbines are to be installed. If instigated, will it work? Its allowance for the non-rational factor is not apparent. Consideration also has to be given to the fact that most communities are guided by people with leadership qualities. Will they not try to convince other residents, not so powerful individuals, to follow their line or reasoning? Section 3 demonstrated the involvement of a (previous) Liberal Frontbencher as well as a businessman, (previously) involved in oil, gas and mineral exploration, as being instrumental in setting up the anti-wind-lobby of the Landscape Guardians. This is an important point because every community exists of leaders and followers. Hindmarsh's (2010) plan regarding facilitating social mapping of local community qualifications and limits, about wind farm location in conjunction with technical mapping of wind resources, seems appropriate. However, the concern here is will such a rational approach work? Where conflict arises, rationality is often not the line of action, as all research on NIMBYism shows. If, for instance, the anticipated or real decrease of the value of the property (rational) against the sense of, and identification with place (non-rational) is weighed up: what is more important to the residents, which issue takes priority, will the rational or non-rational argument prevail?

It is believed that similar arguments can be made when we look at the notion of civic good (Gibson, 2005). For instance, who will publicly fund local political campaigns to establish a wind farm? Developers? The government? The civic good is clearly important, but then the

⁹See Section 3.

question arises, whose civic good, and who determines it, which would lead to non-rational arguments. And those who fund the debate, will they not influence the outcome?

The issue of social trust and distrust and the suggested risk communication (Kasperson et al., 1992) also presents some challenges: Who is to be empowered to lead the risk communication? Clearly not every individual can be empowered. Will the community as a whole make a decision? Then we are presented again with leaders and followers and the difficulties described above.

Overall there does not seem to be an easy answer – NIMBYism is and remains a contentious issue; whichever way one looks at it, it is like opening Pandora's Box. An idea to improve or lessen NIMBYism in relation to wind power would be to consider employment opportunities and the escape from poverty. The estimated number of jobs in the world wide wind farm industry is as follows: Germany 90,000; United States 85,000; Spain 40,000; Denmark 25,000; Italy 18,300; United Kingdom 16,000; and Australia 1,600 (IEA, 2009, p. 18). Diesendorf (2003/2004) gives an account of community development and employment, arguing that wind power and other sustainable energy sources can provide more local employment than coal:

Currently wind farms in Australia have about 40% Australian content and create 203 times as many local jobs per kWh generated as coal power. However, as wind power expands, Australian content is expected to rise to 80% and so the number of local jobs per kWh will rise to 4-6 times those of coal. Already job creation is under way: the world's largest wind turbine manufacturer, Vestas, is building a component manufacturing plant in Tasmania (p. 47).

Taking the world-wide estimated employment figures as well as the Australian predictions by Diesendorf into consideration, one should be able to assume that Australia will progress to a clean, renewable future.

Believing in the premise of a politician? This discussion is concluded with the words of an independent member of parliament (Tony Windsor, 2011) who argues that "34,000 new jobs in the renewable energy sector in regional Australia" (p. 2) will be created over the next two decades. Will residents in rural and regional Australia take note?

10. Conclusion

In conclusion it is argued that the Not-in-my-Backyard syndrome in relation to wind farming is alive and thriving, and that the notion needs to be critically assessed because non-rational arguments have rational consequences, i.e. threaten to undermine plans to facilitate wind turbines in regional and rural Australia. As this literature review shows, NIMBYism comes from many sources and there is no easy answer to the non-rational arguments embedded in the concept, there is no easy way to convince local residents in rural and regional Australia that wind farming presents a viable option to reduce greenhouse gas emissions. The influence of the powerful coal industry cannot be underestimated. Evidence exists that people in that industry create fears, uncertainty and doubt. Looking at climate change and at Australia's CO₂ emissions, there is an urgency to consider wind power in a more positive way. It is believed that governments and developers play an important role in promoting wind power and that better communication between different stake holders, including the public, has to take place. Improved communication has to be built on trust so that non-rational perspectives can change. As Sections 3 and 8 demonstrate, the siting of a wind farm can have a negative effect on people's sense of place. One rational issue to be

argued by proponents of wind energy is the creation of new jobs in the industry. Employment in this new industry could be an escape from poverty in rural and regional Australia, and it could be the catalyst to welcome wind farming. "Farmers are reaping rewards from wind energy" is an article written by Brown (August 21, 2000):

Farmers and ranchers in the United States are discovering that they own not only land, but also the wind rights that accompany it. A farmer in Iowa who leases a quarter acre of cropland to the local utility has a site for a wind turbine can typically earn \$2,000 a year in royalties from the electricity produced. In a good year, that same plot can produce \$100 worth of corn.

Just one last thought: Coleby, Miller and Aspinall (2009) find that young people are more accepting of wind turbines than older ones. This then raises the question, do we have to wait another generation to reduce our greenhouse gas emissions? If NIMBYism, as explored in this chapter, persists, Australia may have no option. But that would be a coal-grey future; therefore hope has to prevail that attitudes will change: "We have a larger moral responsibility to reduce our emissions than most other nations and most other people" (Clarke, 2008, p. 9).

The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.
George Bernard Shaw cited in David Clarke's *The Ramblings of a Bush Philosopher*

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12. References

- 2008 Australian Coal, *Australian Coal Association*, Retrieved August 5, 2011. Published On-line.
- ABC Australian Broadcasting Corporation (25 May, 2011): Acciona scraps wind farm expansion. *ABC Ballarat*. Retrieved August 4, 2011, from <http://www.abc.net.au/news/stories/2011/05/25>.
- ABS Australian Bureau of Statistics (2006). *Regional population growth, Australia and New Zealand*, 2001-02, Cat. No. 3218.0.
- Acciona Energy. *Newsletter Waubra Wind Farm*, Edition 15 June 2011.
- Acciona (n.d.) Project Snapshot *Waubra Wind Farm*.
- Acciona Energy (2006). *Proposed Newfield wind farm: Social impact statement*. Retrieved January 31, 2010, from <http://www.nre.vic.gov.au/>
- Andrews, G. (2001). *Market based instruments: Australia's experience with trading renewable energy certificates*. Paper presented at the Workshop on Good Practices in Policies and Measures. Published On-line.
- Berg, C. (2003). *Minimising community opposition to wind farm developments in New Zealand: Opportunities in renewable energy planning*. Wellington: Victoria University.
- Birrell, J.R. (n.d.) *Senate wind farm inquiry*. Retrieved August 3, 2011, from <http://senate.aph.gov.au/submissions/committees/viewdocument>.

- Bond, S. (2009). *The tale of two windy cities: Public attitudes towards wind farm development*. Curtin University of Technology: School of Economics and Finance. Published Online.
- Brennan, M.A., Flint, C.G. & Luloff, A.E. (2008). Bringing together local culture and rural development: Findings from Ireland, Pennsylvania and Alaska. *Sociologia Ruralis*, 49(1): 97-112.
- Brown, L. (21.8.2000). Farmers are reaping rewards from wind energy. *Grist beta*. Retrieved October 20, 2009, from <http://www.grist.org/article/brown-something/>.
- BTM Consult ApS (2009). *Windfarm management*. Retrieved March 30, 2010, from <http://www.btm.dk/special+issues/others+issues/the+wind+power+sector/?s=42+>
- Clarke, D. (2008). *Greenhouse/Climate Change and Australia*. Retrieved July 7, 2011, from <http://www.oocities.org/daveclarkecb/Australia/Greenhouse.html>.
- Clarke, D. (2008, updated 2010). *Wind farms in New South Wales*. Retrieved May 5, 2010, from <http://ramblingsdc.net/Australia/WindNSW>.
- Clarke, D. (2008, updated 2011). *Australia's wind power potential: Wind in the bush*. Retrieved July 11, 2011, from <http://ramblingsdc.net/Australia/WindPotential.html>.
- Clarke, D. (2009) *Wind power and wind farms in Australia: Wind in the bush*. Retrieved July 3, 2011, from <http://www.oocities.org/daveclarkecb/Australia/WindPower.html>.
- Clarke, D. (2010, updated to 2011). *Wind power and wind farms in Australia: Wind in the Bush*. Retrieved July 2, 2011, from <http://ramblingsdc.net.Australia/WindPower.html>.
- Clarke, D. (2011). *The Ramblings of a bush Philosopher*. Retrieved July 3, 2011, from <http://ramblingsdc.net/>.
- Clean Energy Council (2009) *Clean energy report*. Retrieved March 30, 2010, from <http://cleanenergyaustraliareport.com.au/industry-snapshot/>
- Clean Energy Ideas (2011). *Advantages & disadvantages of wind energy*. Retrieved March 6, 2011, from http://www.clean-energy-ideas.com/articles/advantages_and_disadvantages_of_wind_energy.html.
- Coleby, A.M., Miller, D.R. & Aspinall, P.A. (2009). *Public attitudes and participation in wind turbine development*. Retrieved February 25, 2011, from <http://ideas.repect.org/a/wsi/jeapmx/v11y2009i01p69-95.html>.
- Combet, G., Minister Assisting the Minister for Climate Change and Energy Efficiency (2010). *Renewable Energy (Electricity) Amendment Bill 2010*. Retrieved July 4, 2011, from www.climatechange.gov.au/media/Files/minister.
- Commonwealth of Australia, Senate Committee (23 June 2011). *Impact of Rural Wind Farms*. Report Chapter 1. Retrieved July 1, 2011, from http://www.aph.gov.au/senate/committee/clacctte/impact_rural_wind_farms/report/cO1.pdf
- Courtice, B. (July 30, 2011). Anti-wind power lobby: farming, fear, uncertainty and doubt. *Green Left*. Retrieved August 4, 2011, from <http://www.greenleft.org.au/node/4847>.

- Cross, B. (July 5, 2010). Renewable power from wind farms and the nimby phenomenon. *Aus/NZ/Oceania Affairs*. Retrieved July 2, 2011, from <http://www.suite101.com/content/renewable-power-from-wind-farms-and-the-nimby-phenomenon>.
- Cubby, B. (9.2.2011). *Australia admits CO2 emissions will balloon*. Retrieved February 2, 2011, from <http://www.smh.com.au/environment/climate-change/australia-co2-emissions>.
- CSIRO, Commonwealth Scientific and Industrial Research Organisation (2009). *The science of tackling climate change*. Retrieved October 2010, from www.csiro.au. Published On-line.
- CSIRO 2003-2011, Commonwealth Scientific and Industrial Research Organisation, 2003-2011. *Energy from coal*, Retrieved August 5, 2011. Published On-line.
- Curry, T., Reiner, D. M., Ansolabehere, S., & Herzog, H. (n.d.). How aware is the public of carbon capture and storage? *Federal Highway Administration*. Retrieved April 4, 2010, from <http://knowledge.fhwa.dot.gov/cops/italladdsup.nsf/7ec05a279f17ed>
- Damborg, S. (1997, updated 2003). *Public attitudes towards wind power*. Danish Wind Industry Association. Retrieved March 7, 2011, from <http://www.windpower.org/en/articles/surveys.htm>.
- Damborg, S. & Krohn, S. (1998). *Public attitudes toward wind power*. Wind Turbine Manufacturers Association. Published On-line.
- Davis, O. (July 2, 2008). *The winds of change*. Retrieved May 4, 2010, from <http://www.theage.com.au/environment/the-winds-of-change-20080701-303d.html>.
- Devine-Wright, P. (2009). Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *Journal of Community & Applied Social Psychology* (19): 426-441. Published On-line.
- Diesendorf, M. (2006). *A sustainable energy future for Australia*, Fact Sheet 5, Issue 2. 5/12/2008. Retrieved February 20, 2011, from www.energyscience.org.au. Published On-line.
- Diesendorf, M. (Summer 2003/04). Why Australia needs wind power. *Dissertation*, 13, pp. 43-48. Published On-line.
- Equipment and Construction News (2010). *Positives and negatives of wind energy – Facts about wind energy*. Retrieved March 3, 2011, from <http://buildernews.galanter.net/2010/09/06/benefits-and-drawbacks-of-wind-energy>.
- Esaiasson, P. (2010) *Why citizens (sometimes) dispute public facility sitings in their neighborhood – An experimental account of the NIMBY-syndrome*. Presentation at the 2010 Annual Meeting of the American Political Science Association, Washington, September 2-5. Retrieved March 8, 2011, from <http://ssrn.com/abstract=1644225>.
- European Commission (1997). *Windenergy - the facts: Volume 5*: Directorate-General for Energy.
- Finlay-Jones, R. & Kouzmin, A. (2004) Putting the spin on wind energy projects. Risk management issues in the development of wind energy projects in Australia. *Wind Development Australia Pty. Ltd*. Published On-line.

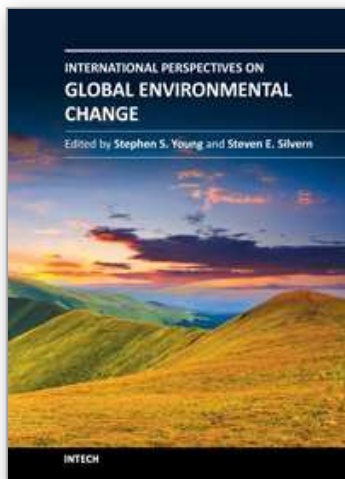
- Firestone, J., Kempton, W., Krueger, A. & Loper, C. E. (2005). *Regulating offshore wind power and aquaculture: messages from land and sea*. University of Delaware: College of Earth, Ocean, and Environment. Published On-line.
- Firestone, J., Kempton, W. , & Krueger, A. (2009). Public acceptance of Offshore wind power projects in the USA. *Wind Energy*, 12: 183-202.
- Garnaut, R. (2011a) (31.5.2011). *Garnaut Climate Change Review – Update 2011. Australia in the global response to climate change. Summary*. Retrieved July 7, 2011, from www.garnautreview.org.au. Published On-line.
- Garnaut, R. (2011b) (24.2.2011 b). *A re-look at climate change – The Garnaut Review 2011*. Retrieved March 14, 2011, from <http://www.carbonneutral.com.au/about-us/news>
- Gibson, T.A. (2005). NIMBY and the Civic Good. *City & Community*, 4(4):381-401. Published On-line.
- Gillard, J. (2011). Gillard reveals carbon price scheme. *ABC News, ABC Broadcasting Corporation*. Retrieved July 12, 2011, from <http://www.abc.net.au/news/stories/2011/07/10>.
- Gipe, P. (2002). Aesthetic guidelines for a wind power future. In M. J. Pasqualetti, P. Gipe & R. W. Righter (Eds.), *Wind power in view*. San Diego: Academic Press.
- Glickel, J. (2011). Siting wind turbines: collaborative processes and joint fact finding to resolve NIMBY disputes. *Journal of Social Issues*, 48(4): 39-61, Retrieved June 29, 2011, from <http://web.met.edu/dusp/epp/music/pdf/glickel.pdf>.
- Government Victoria (2007). *Sustainability Victoria. Wind energy. Myths and Facts*. Retrieved March 8, 2011, from http://www.Sustainability_vic.gov.au.
- Haggett, C. & Toke, D. (2006). Crossing the great divide – Using multi-method analysis to understand opposition to wind farms. *Public Administration*, 84(1): 103-120.
- Hepburn Renewable Energy Association, *Media Release October 2007. Wind farm co-op winding up*. Retrieved December 1, 2010, from http://www.hepburnwind.com.au/windfarm_project.
- Hindmarsh, R. (2010). Wind farms and community engagement in Australia: a critical analysis for policy learning. *East Asian Science, Technology and Society: An International Journal*. Published online. Retrieved February 28, 2011, DOI 10.1007/s12280-010-9155-9.
- Howden, D. (June 12, 2007). Conservationists fight to keep wind farms off Skyros. *The Independent*. Retrieved July 2, 2011, from <http://www.independent.co.uk/news/world/europe/conservationists-fight-to-keep-wind>.
- Hurst, D. (March 17, 2011). NIMBYs ‘a threat to proper planning’. Retrieved July 2, 2011, from <http://www.brisbanetimes.com.au/queensland/nimbys-a-threat-to-proper-planning>.
- Impey, T. (22 June 2011) Man vs wind farm. Australian Broadcasting Corporation, *ABC South East SA*. Retrieved August 4, 2011, from <http://www.abc.net/local/stories/2011/06/22/3250488>.
- International Energy Agency (2009). *IEA Wind Energy Annual Report 2008*, ISBN 0-9786383-3-6. Retrieved August 4, 2011. Published On-line.

- Johansson, M. & Laike, T. (2007). Intention to respond to local wind turbines: The role of attitudes and visual perception. *Wind Energy*, 10: 435-451.
- Johnson, A. & Jacobsson, S. (2000). *The emergence of a growth industry - a comparative analysis of the German, Dutch and Swedish wind turbine industries*. Paper presented at The 8th International Joseph A. Schumpeter Society Conference. Retrieved February 10, 2011, from <http://www.cric.ac.uk/cric/events/schumpeter/papers/100.pdf>.
- Jopson, D. (April 2, 2010). Tilting at windmills: why families are at war, *Sydney Morning Herald*. Retrieved April 5, 2010, from <http://www.smh.com.au/environment/energy-smart/tilting-at-windmills-why-families-a>.
- Jopson, D. (April 5, 2010). Wind farm approval blows town apart, *Sydney Morning Herald*. Retrieved April 5, 2010, from <http://www.smh.com.au/environment/energy-smart/wind-farm-approval-blows-town-a>.
- Kagkelidou, M. (April 13, 2007). Serifos island opposes gigantic windpark plans. *Athens News*. Retrieved 2 July 2011, from http://www.athensnews.gr/old_issue/13230/15997.
- Kampermann, G.W. & James, R.R. (2008a). *The 'how to' guide to siting wind turbines to prevent health risks from sound*. Windaction.org. Retrieved July 7, 2011, from <http://www.savethetorontobluffs.com/pdf/kamperman-james-8-26-08-report-pdf>.
- Kampermann, G.W. & James, R.R. (2008b). *VIII. Noise-Con 2008 Paper*. Dearborn, Michigan. Windaction.org. Retrieved July 7, 2011, from <http://www.savethetorontobluffs.com/pdf/kamperman-james-8-26-08-report-pdf>.
- Kann, S. (2009). Overcoming barriers to wind project finance in Australia. *Energy Policy*. Retrieved April 4, 2010, from <http://solar.anu.edu.au/pubs/2009/Overcoming%20barriers%20>
- Kasperson, R.E., Golding, D. & Tuler, S. (1992). Social distrust as a factor in siting hazardous facilities and communicating risks. *Journal of Social Issues*, 48(4), 161-187. Published On-line.
- Knott, M. (7 February 2011). Garnaut to Australia: at least try to keep up. *Crikey*. Retrieved February 13, 2011, from <http://www.crikey.com.au/2011/02/07/garnaut-to-oz-stop-blaming-china-for-climate->
- Krohn, S., Morthorst, P-E. & Awerbuch, S. (2007). *The economics of wind energy*. European Wind Energy Association. www.ewea.org. Published On-line.
- Leaske, J. (2010). To hatch a Crow. Feeble wind farms fail to hit full power. Retrieved June 29, 2011, from <http://tohatchacrow.blogspot.com/2010/03/feeble/wind/farms/fail/to-hit-full.html>.
- Liebmann, C. (2003). Southern Cross Windpower submission to MRET review. *Submission to the Mandatory Renewable Energy Target Review Panel* Retrieved February 1, 2010, from <http://www.mretreview.gov.au/pubs/mret-submission20.pdf>.

- Lothian, A. (2008). Scenic perceptions of the visual effects of wind farms on South Australian landscapes. *Geographical Research*, 46(2): 196-207. Doi: 10.1111/j.1745-5871.2008.00510.x.
- Lynley, M. (May 24, 2011). Main wind could be latest 'not in my backyard' casualty. *Venture Beat and Nokia Conversations on the Global App Economy*. Retrieved July 2, 2011, from <http://venturebeat.com/2011/05/24/main-wind-farm-nimby-casualty>.
- Macintosh, A. & Downie, C. (2006). *Wind farms: the facts and the fallacies*. The Australia Institute. Retrieved June 29, 2011, from <https://www.tai.org.au/documents/downloads/DP91.pdf>.
- Marquart-Pyatt, S.T. & Petrzela, P. (2008). Trust, the democratic process, and involvement in a rural community. *Rural Sociology*, 73(2), 250-274. Published On-line.
- Mercer, D. (2003). The great Australian wind-rush and the devaluation of landscape amenity. *Submission to the Mandatory Renewable Energy Target Review Panel*. Retrieved February 1, 2010, from <http://www.mretreview.gov.au/pubs/mret-submission22.pdf>.
- National Health and Medical Research Council (July 2010). *Wind turbines and health. A rapid review of the evidence*. Australian Government. Retrieved July 1, 2011, from http://www.gov.au/_files_nhmrc/attachments/new0048
- Nelson, S. (2005). Wind generation and the South Australian economy. *Economic Issues*, 15. Published On-line.
- Nolan, T. (February 9, 2011). Australia's emissions projected to rise sharply. *The World Today* with Eleanor Hall, *ABC Local Radio*. Retrieved February 13, 2011, from <http://www.abc.net.au/worldtoday/content/2011/s3134150.htm>.
- Offor, T. (2002). The public and "not in my backyard" – Strategies for engaging angry communities. Paper presented to the 8th Renewable and Sustainable Power Conference, Alice Springs Convention Centre, 13 August 2002. Published On-line.
- Pasqualetti, M. J., Gipe, P. & Righter, R. W. (2002). *Wind power in view: energy landscapes in a crowded world*. San Diego: Academic Press.
- Radical Green Watch*, (February 13, 2010). Retrieved August 4, 2011, from <http://www.radicalgreenwatch.com/main>.
- Reeves, A. & Beck, F. (2003). *Wind energy for electrical power: a REPP issue brief*. Washington DC: Renewable Energy Policy Project. Published On-line.
- Reiner, D., Curry, T., de Figueiredo, M., Herzog, H., Ansolabehere, S., Itaoka, K., et al. (n.d.). *An international comparison of public attitudes towards carbon capture and storage technologies*. Retrieved February 1, 2010, from <http://www.geos.ed.ac.uk/ccs/Publications/Reiner1.pdf>.
- Richards, C. & Bjorkhaug, H. (2009). Comment: The importance of agency in facilitating the transition to a multifunctional countryside. *Journal of Rural Studies*, 25: 249.
- Righter, R. W. (2002). Exoskeletal outer-space creations. In M. J. Pasqualetti, P. Gipe & R. W. Righter (Eds.), *Wind power in view*. San Diego: Academic Press.
- Rodriguez, J. M., Fernandez, J. L., Beato, D., Iturbe, R., Usaola, J., Ledesma, P., et al. (2002). Incidence on power system dynamics of high penetration of fixed speed and doubly fed wind energy systems: study of the Spanish case. *IEEE Transactions on Power Systems*, 17(4), 1089-1095.

- Russell, B. (January 1, 2008). 'Nimbyism' blocking the spread of wind farms. *The Independent*. Retrieved July 2, 2011, from <http://www.independent.co.uk/environment/climate/change/nimbyism-blocking-the-spr>.
- Ryan, A. (2005-2009). *Advantages and disadvantages of wind power*. Retrieved March 6, 2011, from <http://www.technologystudent.com/energy1/wind8.htm>.
- Ryder, T. (April 30, 2011). NIMBYs' whines grist for windmills. *The Australian*. Retrieved July 2, 2011, from <http://www.theaustralian.com.au/news/executive-lifestyle/nimbys-whines-grist-for-win>.
- Seelye, K.Q. (April 28, 2010). Big windfarm off Cape Cod gets approval. *The New York Times*. Retrieved July 8, 2011, from <http://www.nytimes.com/2010/4/29/>
- Siegel, A. (November 27, 2007). NIMBYism – Global Obstacle to a Renewable energy Future. *New York Times*. Retrieved July 2, 2011, from <http://www.celsias.com/article/nimbyism-a-global-obstacle-to-a-renewable-energy>.
- Sims, S. & Dent, P. (2007). Property stigma: wind farms are just the latest fashion. *Journal of Property Investment and Finance*, 25(6), 626-651.
- Sobey, E. (April 29, 2010). Daylesford wind farm goes alone. *The Courier*. Retrieved December 1, 2010, from <http://www.thecourier.com.au/news/local/news/general/daylesford-wind-farm-goes-alone>.
- Strong, G. (May 22, 2010). Towns split on which way the wind blows. *The Age*. Ref.70416766
- Taylor, R. & Grubel, J. (July 9, 2011) Australia unveils biggest carbon-reduction scheme outside Europe. *Business & Financial News*, Breaking US & International News, Reuters.com. Retrieved July 25, 2011, from <http://www.reuters.com/assets/print>.
- The Border Watch* (June 23, 2011). Court blocks \$175m wind farm project. Retrieved August 4, 2011, from <http://www.borderwatch.com.au/archives/9443>.
- Walker, C. (January 19, 2011). Nimby-ism to get boost in anti wind campaign? *Business Green*, UK. Retrieved July 2, 2011, from <http://yes2renewables.org/2011/01/19/nimby-ism-to-get-boost-in-anti-wind-campaign>
- United Nations Statistics Division (2008a) *Millennium Development Goals Indicators: Carbon dioxide emissions (CO2), thousand metric tonnes of CO2 (CDIAC)*. Retrieved August 6, 2011, from <http://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid>.
- United Nations Statistics Division (2008b) *Millennium Indicators: Carbon dioxide emissions (CO2), metric tons of CO2 per capita (CDIAC)*. Retrieved August 6, 2011, from <http://unstats.un.org/unsd/mdg/SeriesDetail>.
- Wikipedia*. Windpower in Australia. Retrieved July 13, 2011, from http://en.wikipedia.org/wiki/Wind_power_in_Australia.
- Wind Power World Wide*. Retrieved March 7, 2011, from www.wwindea.org/home/index2.php?option=com_jce&task=popup&img=imag
- Windsor, T. (28.2.2011) Carbon tax 'could create thousands of jobs'. *ABC News*, Climate Change. Retrieved February 28, 2011, from <http://www.abc.net.au/news/stories/2011/02/28/3150493.htm>.

- Wolsink, M. (2000). Wind power and the NIMBY-myth: institutional capacity and the limited significance of public support. *Renewable Energy*, 21, 49-64.
- Woods, M. (2003). Conflicting environmental visions of rural: Windfarm development in Mid Wales. *Sociologia Ruralis*, 43(3): 271-288.
- World Future Council, Press Release 24.03.2010. 100% Renewable energy for cities is possible. Retrieved February 1, 2011, from www.worldfuturecouncil.org.
- World Wind Energy Association, WWEA (2010). Retrieved February 10, 2011, from http://www.wwindea.org/home/index2.php?option=com_jce&task=popup&img=imag.



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