Empowering wind power

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Empowering wind power

On social and institutional conditions affecting the performance of entrepreneurs in the wind power supply market in the Netherlands

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1 Creating a new market

1.1 Introduction

Projections of global electricity demand show an alarming increase, with demand forecast to at least double over the next 30 years (IEA, 2002; IPCC, 2001a; J. Sawin & Flavin, 2004; J. L. Sawin, 2004). The existing power and infrastructure sectors that have to meet this growing demand are based on an electricity supply system that features some serious drawbacks. The system relies on the burning of fossil fuels. Fossil fuels are finite and will become increasingly difficult and more expensive to extract as economically recoverable reserves are exhausted. Moreover, the burning of fossil fuels is the main source of carbon dioxide emissions, which is an important cause of global climate change.

Alternative technologies based on renewable energy sources, such as solar energy and wind energy, can largely avoid these disadvantages. These technologies have a potential to increase energy security and mitigate global climate change. Moreover, these alternative technologies have the potential to contribute to poverty reduction in many parts of the developing world (Goldemberg, 2004; J. L. Sawin, 2004). Consequently, governments around the world are trying to stimulate the development and use of renewable energy technologies.

This dissertation analyses institutional and social conditions that promote or discourage the implementation of renewable electricity technologies and the application of suitable policy instruments. It focuses on wind energy for electricity generation, analysing the evolution of the wind power supply market in the Netherlands. Special attention is given to the liberalisation of the electricity market. The primary social actors for the implementation of wind energy projects in a liberalised market are entrepreneurs willing to invest. Understanding the conditions that trigger entrepreneurs to invest in these projects and the conditions that determine the prospects of success for entrepreneurs that implement and exploit their projects is vital for setting up effective policies to stimulate wind electricity generation. The institutional regulatory dimension and the social context as explanatory variables for the emergence and performance of wind power entrepreneurs are central to this research project.

1.2 The need for renewable energy

The electricity supply system, in which primary energy sources are converted to meet the demand for electricity services, is essentially based on the availability of fossil fuels. Coal, oil, and gas account for 80% of primary energy consumption worldwide (Goldemberg, 2004). These energy sources are finite and hence can be exhausted. Without alternatives, shortages of coal or oil will reduce our ability to travel further than walking or cycling distance and paralyse industrial processes. The fuel crises of the 1970s showed that international conflicts can cause shortages in

the supply of fossil fuels and strong fluctuations in price, which are in turn potential sources of social unrest. Dependence on fossil fuels, which as a raw material are located in specific regions of the world, is a challenge to geo-political stability and a cause of economic vulnerability (Goldemberg, 2004).

The direct relationship between the exploitation of fossil fuels and a number of serious environmental problems is the second major disadvantage. A key problem is the increased concentration of carbon dioxide (CO_2) in the atmosphere. Fossil fuel combustion is the main source of carbon dioxide emissions, which are growing at a rate of 0.5% per year. Many scientists point out that the increase in greenhouse gases has a direct bearing on global climate change, leading to higher overall temperatures, changes in the amount of rainfall and a related rise of the sea level (EC, 2005; Goldemberg, 2004; IPCC, 2001b; RIVM-MNP, 2001, 2004). Other environmental problems caused by the extraction of fossil fuels and related emissions of CO_2, NO_x, SO_2, and dust, include acidification and loss of biodiversity and landscape quality both on a continental and a local scale.

Alternative technologies use sources such as water, solar energy, wind energy and biomass. The potential availability of these sources over time and between regions is hardly dependent on resource availability, but rather on geographic developments, technical developments, economic developments or institutional constraints (Hoogwijk, 2004). Furthermore, these alternative technologies have less severe environmental consequences, although there are major differences in the environmental impact of the various renewable energy sources. The sustainable character of electricity from waste streams such as contaminated demolition wood or chicken and pig manure from the intensive bio-industry is a matter of dispute. The sustainability of wind power, which is considered to depend very much on the exact location of the wind park, is also disputed (Junginger, Agterbosch et al. 2004; Pasqualetti et al. 2002).

Another potential advantage of these alternative technologies is their contribution to poverty reduction. Electricity supply in industrialised countries is based on generation in highly centralised power plants and transport through highly centralised transmission systems. Such a centralised electricity supply system is not feasible in many parts of the developing world. However, access to electricity by way of renewable devices is more feasible because they are usually decentralised, modular in size, and have low operating costs. These renewable energy devices could therefore be an important element in poverty reduction in a world where more than 1.6 billion people do not have access to modern affordable energy services, and where this number could grow to two billion by 2020 (Goldemberg, 2004; IEA, 2002; WEC, 2000).

Up to now, the contribution of alternative power generation to the supply of electricity has been quite modest. Two important economic and technical drawbacks have hindered the introduction of renewable electricity generation. First, electricity generated from renewable sources tends to be more expensive than electricity generation using fossil fuels, although one ought to remember that the costs of producing electricity from coal or oil would double, and the cost of electricity production from gas would increase by 30%, if external costs such as damage to natural ecosystems, human health and the built environment were taken into account. Inclusion of these costs would reduce the difference between the market prices of fossil fuel electricity generation

and renewable electricity generation (Dorland, Jansen, Tol, & Dodd, 1997). Second, renewable electricity generation is in some cases, such as wind power and solar energy, less reliable because the primary energy source cannot be controlled.

1.3 Governmental commitment to increase the share of renewable energy

Governments tend to rate the advantages of renewable electricity generation more highly than the advantages of fossil fuel-based electricity generation. Since the 1992 UN Conference on Environment and Development (UNCED), renewable energy issues have featured fairly prominently on the international environment and development agenda. A well-known example of the increased attention of the international community is the Kyoto agreement on the reduction of CO_2 and other greenhouse gas emissions. The European Union (EU) has pledged to lower its CO_2 emissions to levels 8% below 1990 levels by 2012 ("Council Decision concerning the approval, on behalf of the European Community, of the Kyoto Protocol of the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder," 2002). In 1997, the European Commission published a White Paper setting out the EU's target of increasing the share of renewable energy to 12% of total energy consumption by 2010. This is based on the assumption that about two-thirds of the target will be achieved in the electricity sector. The consumption of electricity represents about 40% of the gross energy consumption within the European Union, implying a target of approximately 22.1% for electricity production from renewable sources by 2010 (EC, 1997). These targets correspond to the EU commitments under the Kyoto Protocol. At the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, the member states of the United Nations agreed to: 'With a state of urgency, substantially increase the global share of renewable energy sources with the objective of increasing its contribution to total energy supply'. Two years later, at the International Conference for Renewable Energies in Bonn, Germany, ministers and government representatives from 154 countries reaffirmed this commitment to increase the global share of renewable energy, and underlined the need for coherent policy frameworks that support the development of renewable energy markets.

In the Netherlands, in its third white paper on energy in 1995 the government formulated a policy goal that renewable energy would account for 10% of the total energy supply in the Netherlands in 2020 (Ministry of Economic Affairs, 1996). It especially emphasised electricity from renewable energy sources. The target set for renewable energy was that it would secure a 17% share of domestic electricity consumption, which translates to a 6% share of the total energy demand. More recently, the Dutch government formulated an intermediate target of a 9% share of electricity consumption in 2010, in line with the target formulated in the EU directive on renewable electricity ("Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market," 2001).

In 2002 and 2003, renewable electricity sources accounted for 4.1% of total electricity production in the Netherlands. The principle renewable source of electricity was biomass, which accounted for 80% of renewable electricity production, representing a 70% share of total renewable energy production. Wind power was the second largest renewable electricity source,

accounting for 22% of total renewable energy production. National renewable energy production accounted for only a small proportion of national energy consumption. Biomass accounted for 1%, and wind power for 0.33% of the total energy consumption in the Netherlands in 2003. It will take a great deal of effort to reach the Dutch target of a 17% contribution to domestic electricity consumption in 2020 (EREC, 2004; Pas van der & Alphen van, 2004).

1.4 Creating a sustainable liberalised electricity supply market

From a technological point of view, the existing electricity supply system in industrialised countries is mature and fairly sophisticated. Electricity is generated in highly centralised power plants, where a primary energy source is converted into electrical power. Fossil fuels and nuclear fission are the primary energy sources. The main advantages of electricity generation based on these primary energy sources are the price of the generated electricity and the controllability of the output. The ultimate drivers in the technological development of this system have been the optimisation of the system at an increasing scale, maintenance of reliability and reduction of operation costs.

Traditionally, the national electricity supply sector in most industrialised countries has been a centrally planned and vertically integrated monopolistic system in which none of the activities (production, distribution and grid management) was subject to competition. In the Netherlands, new capacity was planned in consultation between utilities owned by local and regional government agencies and the Ministry of Economic Affairs. Though security of supply was fairly high, there was no market mechanism at work to encourage electricity companies to increase efficiency and reduce costs (Hofman & Marquart, 2001).

In the 1990s the European Commission challenged the existence of national state monopolies as being contrary to the European treaty's rules on the free movement of goods (Kjaer & Schafer, 2004). The UK (1989) and Norway (1991) initiated the liberalisation of electricity markets. Following these early initiatives, in 1993 member states of the International Energy Agency (IEA), as part of the Organisation of Economic Cooperation and Development (OECD), formulated common goals stressing the importance of creating a free electricity market. They agreed that liberalised electricity markets should be one of the points of departure for national electricity supply policy. Three years later this led to the Directive 96/92/EC of the European Parliament and the European Council concerning common rules for the internal market in electricity ("Directive 1996/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal electricity market," 1996). This first electricity directive required member states to open up their market in three nearly equal phases, with 33% of the market to be free in 2003[1]. The need for liberalisation has always been argued in very general terms, with economic arguments prevailing. The explicit goal was to achieve higher efficiency and lower consumer prices by introducing conditions of intensified commercial competition (AER, 2003; Meyer, 2004). In the process the liberal democratic member states of the EU embraced the market system as a co-ordinating mechanism for the electricity supply sector.

In line with EU policy, the Dutch government presented the liberalisation of the electricity sector as a main line of policy in its third white paper on energy in 1996. Another main line of policy in that white paper was the promotion of a sustainable energy supply. These two policy lines have remained central to Dutch electricity policy over the last decade (Ministry of Economic Affairs, 1996, 1997, 2002) and correspond with the line adopted in the EU directive on renewable electricity (EU 2001).

Liberalisation implies greater competition for companies, if the market functions properly, with few barriers for new entrants. According to neoclassical economics, the rationale of liberalising a market is to achieve an efficient allocation of resources, which reflects time preferences and the interests of producers and consumers. Liberalising electricity markets thus creates the opportunity of opening the market for new products, such as renewable electricity, and of making the production of existing products, such as fossil fuel-based electricity, more efficient, provided that the sustainable character and costs of these products are valued by consumers.

There are indications that liberalising the markets has in fact made it more difficult to finance renewable electricity projects due to relatively high up-front capital costs and long timeframes for a return on investment. The commercial goal of profit maximisation that is often based on time horizons of five to ten years and the long return timeframes of renewable electricity projects seem to be conflicting (Meyer, 2004). Moreover, competition between electricity producers bidding into spot markets seems unfavourable for some renewables. A daily spot market (Amsterdam Power Exchange -APX) has been operational since May 1999. This electronic energy-trading platform enables distributors, producers, traders, brokers and industrial end users to buy and sell electricity on a day-ahead basis. Such a spot market seems unfavourable for intermittent resources such as wind power that cannot provide power on demand.

Room in the market for new, environmentally safer but often more expensive products, such as a sustainable electricity supply by way of renewable electricity generation, will not be created automatically by free market forces (Kremers, 1995). This is due to some fundamental limitations of the market mechanism: the dominance of material interests such as low prices and the desire for short payback periods, the inclination to monopolise, and the inability to intrinsically operate according to moral preferences. Immaterial interests, such as environmental protection and human rights, do not automatically occupy a place in trade-offs made in an open market (Glasbergen, 2002).

Experience in the electricity sector up to now has shown that liberalisation leads to the emergence of strong business concentrations, which may lead to private monopolies with less concern for environmental problems (AER, 2004; Greenpeace & EWEA, 2001). As long as the costs of emitting carbon and other environmental externalities are not reflected in market prices there is a chance that retail competition in itself will work against renewable energy investments. These external costs have been estimated to be 3 to 4 €ct/kWh for electricity generated from fossil fuels in the Netherlands. Adding these external costs to production costs of 3 to 4 €ct/kWh for generating electricity from gas and coal doubles the market price of these forms of electricity generation[2].

Focussing on investments, the International Energy Agency projects that $16 trillion will be invested worldwide in energy-supply infrastructure between 2001 and 2030. Nearly 60% of

this is expected to go to the electricity sector (IEA, 2002; J. L. Sawin, 2004), signifying that, if current energy demand trends continue, $10 trillion will have to be invested in the electricity sector over the next 30 years to maintain, replace, and expand infrastructure (Sonntag & Usher, 2004). Within the electricity sector, renewable electricity technologies will have to compete for investments with fossil fuel technologies (as the major segments of the electricity market).

In 2001, the General Energy Council in the Netherlands drew attention to the fact that societal interests, such as a properly functioning market, reliable energy supply and an acceptable level of environmental burden won't be served automatically by free market forces (AER, 2001). The Council stressed the need for governments to assume a new and crucial role in directing the market mechanism to protect those public interests (AER, 2004). It recognised that directing the market mechanism to encourage entrepreneurs to invest in renewable electricity projects was a problem that required attention.

1.5 Focussing on the creation of a wind power supply market

This dissertation analyses the evolution of the wind power market in the Netherlands in relation to the issues discussed above. The focus on wind power is justified by the fact that the wind sector is expected to account for the bulk of renewable electricity generation in the Netherlands, as it does in most EU member states (Szarka 2004: 4). The geographical conditions make wind power a fairly feasible option in the Netherlands. The wind conditions are comparable to the wind conditions in Denmark, which has become one of the main wind power markets in the world (Kamp & Smit, 2004; J. L. Sawin, 2004).

Wind power involves two different but related markets: the wind turbine manufacturer market and the wind power supply market. The number of wind turbine manufacturers fell from 12 in 1986 to three in 1991 and only one in 2000. Several authors have described and explained the unsuccessful history of the Dutch wind turbine industry in detail (Kamp, 2002; Bergek and Jacobsson, 2003; Verbong, 1999), and the subject will not be considered any further in this dissertation. This research project focuses on the wind power supply market, the roles of different entrepreneurial groups active in the market and the role of governmental steering.

The history of modern wind power exploitation dates back to the end of the 1970s and the beginning of the 1980s. Wind electricity generation technology was the first renewable energy technology commercially available in the Netherlands, and from the mid-1980s the Dutch wind power supply market started to grow thanks to the introduction of investment subsidies. The Dutch government expressed high ambitions for onshore (and later offshore) wind energy during the 1980s and 1990s. An ambitious goal of 1000 MW by the year 2000 had already been formulated in 1985 and remained the official basis of wind energy policy until 2000 (Verbong, Selm van, & al, 2001; Wolsink, 2000). Implementation, however, turned out to be a laborious process and the production of wind energy in the year 2000 (about 447 MW installed capacity) failed to meet the government's target of 1000 MW. It was 2004 before the government's original target was met. New targets were set in 2002 when the Ministry of Economic Affairs raised the onshore target to 1500 MW in 2010 and fixed a target of 6000 MW in 2020 for offshore wind energy (Ministry of Economic Affairs, 2002). Moreover, the Energy Report for 2002 heralded

a shift away from considering a broad spectrum of renewable energy options towards a focus on electricity from biomass and wind. Wind and biomass were also to become priority areas in Dutch government-supported R&D activities (Ministry of Economic Affairs, 2001a).

The Dutch wind power supply market was not in a bad position at the beginning of the 1990s. Implementation rates were similar to those in Germany and exceeded those in Spain (Bergek & Jacobsson, 2003; Kamp & Smit, 2004). Moreover, the wind conditions were as good as in Denmark. Currently, however, the Netherlands is lagging behind Germany, Spain, and Denmark, countries that make up the main markets in Western Europe.

1.6 Technical and economic conditions

We saw two lines of change concerning the electricity sector in sections 1.2 and 1.3. The first line of change was liberalisation, and the second was the increase in the government's commitment to enlarging the share of renewable energy in total energy supply. Liberalisation of the electricity market implies a transition from a closed monopoly with a few state-owned enterprises to an open market with multiple private companies or entrepreneurs. Entrepreneurs are the primary social actors for the planning and allocation of future production and distribution in an open market (Coriat & Weinstein, 2002:277). Implementation of new technologies and hence market development will not take place without entrepreneurs continually taking initiatives and risks. Consequently, the major focus of renewable electricity policy must be on encouraging entrepreneurs to invest in renewable electricity projects (Haas, 2004). This raises two questions: first, what conditions trigger investments in renewable electricity technologies and second, what conditions determine the implementation of renewable electricity projects. Ex-ante potential studies are a common method used to address these questions in policy support research.

In a first exploratory study for this dissertation we compared four ex-ante studies with respect to the potential they calculated for different renewable electricity options in the Netherlands. The principal focus was on the arguments and conditions that were used as the foundation for the calculations in the model (Junginger, Agterbosch, & al, 2004).

The four studies included a time horizon until the year 2020 and were conducted on behalf of Dutch policymakers; the outcomes were intended to be used as input to formulate new policies. The studies stressed economic and technical conditions: economic viability and technological progress played a key role in projected diffusion and market development. Government policy and the attitudes and behaviour of relevant policymakers and private actors were acknowledged in all studies as being important for diffusion, but these conditions were not incorporated in the models used to calculate potential and penetration rates. The effects of government policies were only taken into account insofar as they had an effect on quantifiable economic feasibility. Consequently, the studies emphasised financial instruments (e.g. R&D or other subsidies). Looking at the scenarios for wind power we observed that there was a considerable range between the scenarios of the four studies and between different scenarios within each study. The 'best guess' range that was found in the different scenario studies for onshore wind power in 2020 was 700 MW-3100 MW, and for offshore wind power 500 MW-2600 MW: the results in the

highest and lowest scenario differed by more than a factor of four (Junginger et al., 2004). The studies concluded that the Dutch policy goals for wind power might be achieved if developments were favourable. This actually means favourable technological and/or economic key parameters.

In the Netherlands, as in most European countries, policy goals for renewables are often based on the type of potential-assessment studies mentioned above (Wolsink, 2000). Priority is given to instruments that improve technical and economic conditions and alter the relative costs of, for instance, wind power generation and fossil fuel power generation. This policy line is in accordance with the standard classical economic rationale for the market. According to this rationale, the behaviour of entrepreneurs is determined by technical and economic conditions, such as the technological and economic performance of renewable power generation technologies (Hamilton & Feenstra, 1998; Tijdink, 1996). The influence of financial support systems on the cost performance of these technologies was analysed by Dinica (Dinica, 2003). This research included case studies on wind technology diffusion in Spain, diffusion of biomass technologies in Spain, diffusion of small hydropower in Spain, diffusion of wind technology in the United Kingdom and diffusion of wind technology in the Netherlands in the 1990s. Dinica focused particularly on the economic feasibility and profitability of wind power projects, and on investors' behaviour under different types of financial support systems. With regard to wind power in the Netherlands, the number and types of investors was more diverse than theoretically expected for some periods. For instance, the presence of financing agents was not expected under minimal investment conditions for private wind power producers in the period 1990-1997. In addition, at the end of the 1990s wind power capacity increases remained modest despite reasonable to high profitability levels for different types of investors, such as independent power producers and electricity companies. From the perspective of the availability of financing, the prospects for diffusion were rather good at that time, but exogenous variables of an institutional regulatory nature, such as constraints imposed by the planning system, prevented exploitation of the resource potential based on the available price support. Empirically, this institutional regulatory dimension, and the importance of the social context, remained somewhat under explored in this study. Accordingly, more empirical work is required on this topic.

1.7 Social and institutional conditions

As a next step in our dissertation research we explored literature that explicitly addresses the institutional regulatory dimension and the social context as explanatory variables for wind power implementation and market development.

Social acceptability
A key issue in wind power implementation studies is the question of social acceptability (Bell, Gray, & Hagget, 2005; Strachan & Lal, 2004; Szarka, 2004). Resistance to wind turbine siting has often been explained by the Not-In-My-Backyard (NIMBY) syndrome, meaning that people are in favour of wind power in general but are opposed to wind turbines in their own area (Berenschot & Paardekooper, 2000; Krohn & Damborg, 1999). Alternative explanations have attributed (local) public resistance to the risk of negative effects for bird populations or landscape quality. In addition, conflicts between investors and local residents about costs and benefits have

been put forward as grounds for lagging implementation (Blom, Klimbie, & al, 2002; Verheij & Hoeve, 2002).

Bell, Gray and Hagget (Bell et al., 2005) explored different explanations for the gap between high levels of public support for wind power in general and the low success rate for planning applications. They identified three different explanations for this so called 'social gap'. The first is the previously mentioned NIMBY phenomenon. The second explanation is the 'democratic deficit' of the planning system, meaning that a small minority of people who are opposed to wind power are able to obstruct the majority of projects. The so-called 'qualified support for wind power' is the third explanation. Qualified support for wind power means that the general support for wind power is dependent on some narrowly defined criteria, such as qualifications regarding impressions of the impact of developments on the landscape, the environment, animals (e.g. birds, fish) and humans. These criteria are often not met in concrete planning applications. Empirically, these three explanations have still not been thoroughly explored.

Institutional conditions

The implementation of new technologies is also influenced by institutional conditions. Policy analysts of the 'innovation system' school developed a multi-dimensional approach to analysing wind power policy. Different institutional conditions affecting implementation are seen as one societal system in this approach. The proponents of this method argue that by studying the characteristics of the societal system it is possible to analyse its potential and the bottlenecks and dynamics in the implementation process (Carlsson & Stankiewicz, 1995; Jacobsson & Johnson, 2000). Such a systemic approach is fruitful because of its focus on the importance of the combination of different policies, which is felt to explain the success of the wind power market. Bergek and Jacobsson (Bergek and Jacobsson 2003 in Szarka 2004) indicated that the following four lines of policies explained the success of the German wind sector:

1. policies that encourage technological variety in wind turbine development (early R&D phase);
2. policies that encourage market creation by bringing a variety of investors to the market (market development phase);
3. industrial policy fostering a home market for wind turbines manufacturers;
4. policies that encourage social legitimacy.

These four policies require long-term collaboration between different units of government. The fourth policy line explicitly stresses the importance of 'social legitimacy', encompassing both governmental or political support and public support. Empirically, however, the analysis was largely confined to technology development (Szarka, 2004). Focusing on industrial policy, problems associated with the spatial planning system and local planning processes are largely ignored by the innovation system approach.

The political and social dimensions, such as the need for collaboration between different units of government, are reported to be problematic in many policy reports. These policy reports stress institutional constraints, such as poor policy integration and lengthy and complex planning processes and approval procedures. A lack of financial incentives and of administrative capacity are also mentioned as reasons for disappointing implementation results (Blom et al., 2002; Ministry of Economic Affairs, 1997, 2002; Ministry of Economic Affairs, Ministry of Spatial

Planning Housing and the Environment, & Ministry of Law, 2004; Verheij & Hoeve, 2002). Van de Ven and Spaans especially focused on institutional bottlenecks in the area of spatial planning in the Netherlands. Ambitious policy goals are set at national level, but problems arise in the spatial planning process of municipalities. They argued that delays in spatial planning are caused by the unwillingness of provincial authorities to use their authority to set binding rules for local authorities (Ven van de & Spaan, 2003).

Wolsink (Wolsink, 1996, 2000), by contrast, stated that a predominantly top-down policy style in wind turbine siting brings with it a serious risk of delay. Use of the decide-announce-defend (DAD) strategy to introduce a plan for a wind farm provokes opposition and leads to delays in implementation (Wolsink, 1996: 1087). The DAD strategy does not give local actors the opportunity to influence the project. Wolsink suggested that a more collaborative approach to siting and creating an interest for stakeholders at the local level are crucial for avoiding local resistance. This question of community participation and stakeholder involvement is another emerging key issue in wind power implementation studies (Szarka, 2004).

Stakeholder requirements

Enzensberger et al (Enzensberger, Wietschel, & al, 2002) focused on the importance of the interests of major stakeholder groups. Different stakeholder groups, such as the renewable power business, the conventional power business, government authorities at different levels and non-governmental organisations, have different expectations and requirements when it comes to a new policy instrument, such as a new financial incentive scheme. Non-governmental organisations, for instance, may stress only environmental requirements. Market players on the other hand may solely stress economic interests and demand adequate profits to compensate for the risks of investments. Government authorities have to balance these different interests. Requirements of different stakeholder groups must be taken into account when selecting policy instruments for wind energy stimulation. Enzensberger et al suggested that a detailed study of the different characteristics of potential investors, such as utilities or specialist independent green power producers, and other stakeholder groups could significantly contribute to the overall success of a political measure. A policy design aimed at reducing the objections of relevant stakeholder groups might in their view result in significantly lower implementation costs (Enzensberger et al., 2002: 799).

To sum up, studies that focus on social and institutional conditions to explain wind power implementation have gained momentum during the last couple of years. Several key issues emerged. Social acceptability or the social impact of wind power, questions of community participation, stakeholder involvement and political or policy dimensions are acknowledged to be important for wind power implementation and market development. Empirically, however, these issues remain somewhat under explored and studies have sometimes produced conflicting explanations. Looking at Dutch studies, we saw for instance that Van de Ven and Spaans argue that delays in implementation occur due to the reluctance of provincial authorities to use top-down spatial planning instruments. Wolsink, on the other hand, argues that it is precisely the use of a top-down policy style that gives rise to the most serious risk of delay. There is clearly a need to come up with a more systemic analysis of the relations between social and institutional factors, wind power policies and the evolution of wind power implementation and market development.

1.8 Objectives and research questions

On the basis of our exploratory research we decided to focus in our study on wind power entrepreneurs, their capacity to implement wind energy and on the social and institutional conditions that influence their investments. There are gaps in knowledge on both these aspects.

First, the dynamics of the market in terms of differentiation in entrepreneurial groups, or the heterogeneity of the market, has scarcely been problemised. This is particularly surprising since understanding the conditions that prompt entrepreneurs to invest in wind power projects and the conditions that determine the chance of success of these entrepreneurs to implement and exploit their projects seems to be vital for realising renewable electricity in a liberalised context. Implementation is an economic activity resulting from socio-economic 'market' processes. Without entrepreneurs continually taking initiatives and risks implementation will not take place and the wind power supply market will not develop.

Second, the importance of technological progress and economic viability for renewable energy technologies has been analysed in a large number of studies. There are various overviews of the economics of renewable energy sources (Johansson, Kelly, Reddy, William, & Burnham, 1993; Turkenburg et al., 2000). In addition, the influence of financial support systems on the cost-performance of wind power in the Netherlands is specifically analysed in Dinica (2003). The significance of the development of renewable energy technologies is also described in a number of studies (Grübler, Nakicenovic, & Victor, 1999; McDonald & Schrattenholzer, 2001; Neij, 1999). However, there is considerable uncertainty about the role of social and institutional conditions. Attention has only been given to these conditions fairly recently and research up to now has yielded contradictory results. Knowledge of these issues is also relevant for policy. The need for governments to assume a new and essential role in directing the market mechanism to protect public interests within a liberalised context is recognised as a problem that requires attention. By analysing social and institutional conditions we will improve insight into the potential for governments to formulate policies that will improve these conditions with a view to stimulating the wind power supply market.

From these considerations we formulated the following core research question:

How and to what extent have social and institutional conditions affected the emergence and performance of entrepreneurs in the wind power supply market in the Netherlands, and what lessons can be learned for future wind power policy?

To analyse the dynamics of the wind power supply market, the roles of different entrepreneurial groups and the role of governmental steering we developed a heuristic concept: *implementation capacity* (IC). This concept is defined as the capacity of wind power entrepreneurs to implement wind turbines. The sum of the relevant economic, technical, social and institutional conditions and their mutual interdependencies determines the IC. These conditions affect the decision of an entrepreneur on whether to invest in a wind power project and determine the possibilities for this entrepreneur to actually implement the project. IC is a relative concept. It enables us to describe and explain differences over time in the performance of different types of entrepreneurs.

The concepts of implementation capacity, institutional and social conditions and the way we define and analyse them will be discussed in detail in the next chapter.

In order to answer the core research question, a number of sub-questions must be answered:
Social and institutional conditions
1. How have relevant social and institutional conditions developed over the years?

Market development
2. How have different types of wind power entrepreneurs performed over the years (in terms of turbines, projects and capacity installed)?

The effect of social and institutional conditions
3. In what way and to what extent is the performance of wind power entrepreneurs determined by developments in social and institutional conditions?

Lessons for future wind power policy?
4. What are the possibilities for national and local governments to improve social and institutional conditions with a view to stimulating the implementation capacity?

Research period
The analysis starts in 1989. Up until the 1990s there was hardly any wind power supply market. The power supply market in the 1980s was a centrally planned and vertically integrated state-monopolistic system. Electricity generation, high-voltage transmission, low-voltage distribution and end-user supply were integrated business processes provided by state-owned electricity companies (Slingerland, 1999). Electricity companies had monopoly power in their own market region: decentralised private investors were bound to sell their electricity to the local electricity company. Pay-back tariffs had to be negotiated on a case by case basis. Consequently, private investors were in a weak bargaining position. In terms of competitiveness, the situation for decentralised private producers was far from ideal, and private producers were almost non-existent.

The core business of the electricity sector was centralised fossil fuel-based electricity generation. To make it attractive for electricity generators to invest in wind energy, the costs of wind power had to be lowered to the costs for saved fossil fuels. The Integral Programme on Wind energy (IPW) (1986-1990) was the first governmental programme to include a financial measure specifically to stimulate wind turbine buyers. As a consequence, wind turbines became more economically attractive and besides some idealistic home builders and farmers, other entrepreneurs such as electricity companies, cooperatives and some private investors became active (Kamp, 2002). At the end of the 1980s, 37.4 MW was installed, the major share of 57% for electricity companies and a smaller share of 9% for wind cooperatives. About 30% of total installed capacity was solitary small-scale turbines mainly implemented by idealistic hobbyists and farmers (Verheij & Hoeve, 2002).

Despite the measures in the IPW, generation costs for wind power were still higher than those of fossil fuel-based electricity generation. Moreover, due to its intermittent character wind power was not expected to be an alternative for conventional centrally produced electricity. Electricity companies were not in favour of decentralised production as they were reluctant to give up their monopoly in electricity generation (Kamp, 2002). Despite this negative attitude towards

decentralised production, one of the basic choices in Dutch national governmental policy has always been that wind power capacity should preferably be installed by large electricity generating companies (Wolsink, 1996). They received a major share of the government's budget for wind energy that was divided between the electricity sector, wind turbine manufacturers and research institutes for technology development. Most R&D and planning activities were undertaken by the SEP (association of electricity generators) and KEMA (research institute for the power sector) (Breukers & Wolsink, 2003).

A major institutional change in the electricity policy field occurred in 1989 with the adoption of the Electricity Act. The aim of the act was to create more competition and greater efficiency in management within the electricity sector through increases of scale and by separating electricity production from electricity distribution (Hofman & Marquart, 2001). Separating production from distribution was a major turnabout in the state-monopolistic electricity supply sector of those days. The Electricity Act marked a first step towards a more market-oriented electricity sector, and to some extent stimulated decentralised wind power production. The implementation of the new Electricity Act in 1989, together with the availability of IPW subsidies, can be considered as a starting point for the development of the wind power supply market in the Netherlands.

1.9 Thesis outline

This thesis analyses the development of the Dutch wind power supply market and the performance of different entrepreneurial groups over the period 1989-2004. We focus on the importance of institutional and social conditions.

Chapter 2 presents the conceptual model, in which the implementation capacity is treated as the explained variable. Literature on institutional approaches was studied to define and operationalise the explanatory variables consisting of institutional and social conditions. This chapter also explains the research methods that were used.

Chapter 3 presents a short history of the roles and positions of actors on the electricity market. In addressing the positions of these main categories of actors and their essential relationships, special attention is paid to wind power generation. The various groups of wind power entrepreneurs have to deal with developments in the electricity market and in national electricity policy. They also have to deal with developments in other policy fields, such as land use, the environment and nature conservation. These policies converge at the operational level of executing wind power projects and constitute the institutional framework within which wind power entrepreneurs and other stakeholders operate. These further institutional conditions are described. The chapter concludes with a quantitative analysis of the development of the wind power supply market in terms of projects, turbines and capacity installed by different entrepreneurial groups over the period 1989 up to 2004. Four different entrepreneurial groups were active in the Netherlands in this period, i.e. energy distributors, small private investors, wind cooperatives and new independent wind power producers. The chapter defines these four groups of wind power entrepreneurs and gives their market shares.

Chapters 4 to 7 include case studies on the implementation capacity of the four entrepreneurial groups. To analyse the implementation capacity we opted for a case study approach in which both quantitative and qualitative sources of information and methods for data gathering are used. These methods are described in chapter 2; the results are presented in chapters 4 to 7. The case studies led to conclusions about the way in which social and institutional conditions affected the implementation capacity of different types of entrepreneurs. Chapter 4 discusses the results for energy distributors, chapter 5 for small private investors, chapter 6 for wind cooperatives and chapter 7 for new independent wind power producers. Chapter 7, in addition, addresses developments with regard to the offshore wind power industry and supply market in the Netherlands. Since the offshore market is a different phenomenon, with different entrepreneurs and government authorities involved, it is not considered at length.

The results of the case studies have been discussed in three validation workshops with stakeholders involved in wind power implementation in the Netherlands. Two of the workshops involved different types of wind power entrepreneurs (market), and one involved provincial and local authority civil servants (government). The workshops took place on 26 April, 28 April and 12 May 2005. The results are reported in Chapter 8. The purpose of the validation workshops was to explore whether the conclusions of the case studies have a more general value and they were used to identify solutions for the problems that were identified.

Chapter 9 is a reflection, based on the conclusions of the market analysis, the case studies and the validation workshops, about the importance of social and institutional conditions for the emergence and performance of wind power entrepreneurs as expressed in our implementation capacity concept. It explains possible routes to improve implementation.

Notes

1 By the year 2003, 33% of the customers in the European Union were expected to have the opportunity to choose an electricity provider. Great Britain, Germany, Finland, and Sweden liberalised their markets more quickly. All customers in these countries were already free to choose a provider from 1999.

2 http://externe.jrc.es/index.html viewed 6 October 2004.

2 Analytical perspective and research strategy

2.1 Introduction

The primary social actors in the implementation of wind power projects in a liberalised market are entrepreneurs willing to invest. Notwithstanding ambitious government targets, wind power generation is doomed to remain a marginal activity unless entrepreneurs see an opportunity to exploit wind power projects in an electricity market generally dominated by fossil fuel electricity generation. For this reason, we have focused in this dissertation on the performance of wind power entrepreneurs, their characteristics and the possibilities and constraints that determine their performance.

In the former chapter we saw that ex-ante potential studies are a common method used for addressing the questions: what conditions trigger investments in renewable (wind) electricity and what conditions determine the implementation of renewable (wind) electricity projects. These studies are used to formulate new policies and they predominantly stress economic and technical conditions to forecast market development. In our study we take a different approach. We assume that apart from developments in wind power technology and the economic performance of wind power generation, investment behaviour and implementation strategies are also determined by dynamics in social and institutional conditions.

The analytical perspective that we used to analyse the investment behaviour of wind power entrepreneurs and their capacity to install wind turbines is called the 'new institutional perspective'. This perspective is appropriate for studying the effects of dynamics in social and institutional conditions. It enables the reinterpretation of structures or conditions that have the appearance of being permanent. We developed an operational research design based on this perspective.

2.2 The 'new institutional perspective'

Wind power entrepreneurs need an enabling environment to develop and implement wind power projects. This environment is determined by (1) a variety of actors involved in the wind power supply market, and (2) institutions or rules that facilitate or constrain the actions of these actors. In this section we will elaborate on these two aspects.

The first aspect relates to actors or social entities with the power to influence decisions. An essential feature of the environment in which entrepreneurs develop wind power projects is that

it involves multiple actors. Different categories of actors are involved, the most important being entrepreneurs, governments and organised social interests. The diversity within these categories is large. The role of the national government differs substantially from the role of regional and local authorities, and the organised social interests can include both supporters and opponents. Wind power entrepreneurs constitute a special set of actors. They vary considerably in their origins, interests and size and include wind cooperatives, farmers, energy companies, one-man companies and large companies such as holding companies with contracting work as their core business. They are in competition with each other. They own and exploit wind power projects and sell the electricity on the power supply market. Each category of actors has its own specific role, and each actor has its own distinctive interests. All of the actors in the wind power supply market determine to one degree or another, the level of implementation and the manner in which implementation takes place. It is through their interactions that projects will be carried out.

Interactions between actors involved in the implementation of wind power projects are always based on certain principles with a more or less stable character. This is the second aspect of the environment for wind power projects and we refer to it as the structures or institutions that affect the behaviour of actors. These structures or institutions create order in a world that would otherwise be chaotic.

Institutions, being more or less solidified expectations and obligations, reduce uncertainties on the wind power supply market by specifying the rules. By imposing constraints and creating possibilities, institutions regulate actors' behaviour. They define the relevant actors and their rights and obligations and they facilitate cooperation. Institutions allow actors to achieve their objectives by organising the processes and procedures to be followed to accomplish them. Wind power entrepreneurs come across a multitude of institutions in the course of their activities, such as spatial planning, licensing activities, connection to the grid and selling electricity on the power supply market. The institutions that are relevant for the implementation of wind power projects are created mainly by government. The laws governing land use planning, for instance, contain rules on licensing, public participation and risk prevention. This institutional system provides for formal deliberation and participation by government authorities, organised social interests and individuals. It organises the procedures that wind power entrepreneurs have to follow to implement a wind power project. At the same time, environmental organisations may use the opportunities provided by this system to raise objections to a project.

Solidity is an important characteristic of institutions. Nevertheless, institutions change due to actors' interactions. Actors try to influence existing institutions according to their own preferences and interests. Through their interactions they change or create institutions with a view to opening up or closing off particular opportunities. With regard to governmental rules or institutions, negotiations in policy making lead to formal decisions regarding the application, amendment and termination of policies and instruments in various policy fields. These decisions create new legally binding institutions or change existing institutions. This institutional dynamic is also visible in policy fields that are relevant for the development of the wind power supply market. At the start of 1996, for instance, the government switched the focus of its incentive system for renewable electricity from subsidies to tax facilities. The introduction of fiscal

instruments created favourable economic circumstances for wind power exploitation at the end of the 1990s. Another example is the liberalisation process. The 1998 Electricity Act established the framework for the liberalisation of the electricity market. New rules improved the bargaining position of private wind power producers.

The analytical perspective that we have introduced in this section to study the investment behaviour of wind power entrepreneurs and their capacity to implement wind energy is generally referred to as the 'new institutional perspective'. Characteristic of this analytical perspective is the interaction between the behaviour and preferences of actors and the possibilities and constraints that are embedded in the institutional context. It is precisely this interplay that is at the heart of our analysis. We used this new institutional perspective to develop an operational research design that would enable us to analyse the dynamics of the wind power supply market, the role of wind power entrepreneurs, their characteristics and performance and the role of governmental steering.

2.3 Institutional research and the concept of institutions

Looking at various social science disciplines, we observe a remarkable convergence of institutional research. Though economics, political science and sociology have a distinctive intellectual lineage, they all contain a 'new institutional' strand.

New institutional economics emerged midway through the 1970s and emphasise the context-bound nature of economic performance (Coriat & Weinstein, 2002; Jessop & Nielsen, 2003; K. Nielsen, 2001; North, 1990). It takes a broad understanding of institutions, in the sense of organisational arrangements, formal rules and informal rules that emerge from actors' interaction (Borras, 2003; Coriat & Weinstein, 2002; Jessop & Nielsen, 2003). New institutional economists argue that economic processes operate within a social framework, which is in turn shaped by cultural and historical forces (Scott, 2001).

The new-institutional perspective in political science emerged in the 1970s and 1980s from critics of the behavioural approach in political science. In the 1950s and 1960s, 'the behavioural revolution' in political science led to a focus on informal distribution of power, attitudes and behaviour rather than on formal governmental institutions. However, according to critics in the 1970s and 1980s, these behavioural theories missed crucial elements of the societal context, i.e. the institutional landscape in which interest groups sought influence (Thelen and Steinmo 1992). The new institutional perspective stresses the relational character between formal administrative, legal and political structures and the behaviour and attitudes of individuals or groups (Thelen & Steinmo, 1992).

New-institutional sociology also emerged in the 1970s and 1980s and is known as the choice-within-constraint framework. The emphasis is on exploring the interrelationships among formal rules, informal norms, social networks and purposive action. This theoretical perspective emphasises both the active role played by individuals in creating and transforming the institutions in which they participate, and the constraints those institutions place on alternatives available to

social actors. Rationality in the sense of purposive action or behaviour is interpreted according to the possibilities and constraints embedded in the institutional environment (Brinton & Nee, 1998; Steunenberg, Vries de, & Soeters, 1996).

In spite of the emergence of common ideas in the various social science disciplines, the concept of institutions is defined in various ways and is surrounded by conceptual ambiguity. We do not intend to explore the notion of institutions in its diverse possible definitions here, but we do need to elaborate on the different ways that the concept is used in order to clarify our own notion of the term.

There are four main ways in which the concept of institution is used:

1. Institutions as humanly defined *macro social structures*, such as religion, ideology, social class and state (Jessop, 1990; Nee, 1998; Steunenberg et al., 1996).
2. Institutions as socially conducted *formalised norms* that pattern behaviour; such as political and legal rules and formal economic rules (Coriat & Weinstein, 2002; Nee & Ingram, 1998; North, 1990).
3. Institutions as socially conducted *informal norms* that pattern behaviour, such as codes of conduct, norms of behaviour and customs (Coriat & Weinstein, 2002; Nee & Ingram, 1998; North, 1990).
4. Institutions as *organisations or actors in the field* (Coriat & Weinstein, 2002; North, 1990).

Clearly, the status of 'institution' is given to very different objects. Several points need to be clarified with regard to the distinctive meanings. In the remainder of this section we will clarify these points and give our definitions of the concepts of institutional conditions and social conditions.

2.3.1 Macro social structures and rules

The distinction between the first meaning of the concept and the second and third meanings given above has to be clarified. The difference lies in the scope.

The first meaning of the concept fits in with macro theories, such as Marxism or methodological holism in sociology. Whereas methodological individualism assumes that social order is a product of the aggregation of individual actions, methodological holism assumes that the social order cannot be reduced to the behaviour of individual actors in the short run (Nee, 1998). In those macro theories, the term institution is used to indicate broad socio-economic structures, such as class structure, which define the parameters of social order at its broadest level. The focus on such overarching and abstract structures is often characterised by structural determinism, where socialisation, culture or social structure are seen as determining social action. In our study, we call these institutions the *wider societal context*, which encompasses those conditions that are not influenced directly by the daily actions of stakeholders involved in the wind power supply market. A clear example of such an institution is the price of electricity produced from fossil fuels, which is determined to a large extent by world coal and oil prices and geopolitical developments.

The second and third meanings of the concept, informal norms and formalised norms, are more limited in scope. Both concern more or less solidified expectations and obligations that pattern

the preferences and behaviour of stakeholders involved in the wind power supply market. We presume that various stakeholders in various modes use the opportunities provided by these institutions to realise their interests. Since 1999, for instance, wind power projects comprising more than 10 turbines or in excess of 10 MW must be examined by the competent authorities to establish whether an Environmental Impact Assessment (EIA) is required or not. Some wind power entrepreneurs may restrict a project to less than 10 turbines or 10 MW to avoid being required to perform an EIA.

2.3.2 Actors

In popular speech it is common to refer to organisations as institutions. The concept of institution is mainly used in this way in discussions in politics and policy. If we wish to analyse both the behaviour of 'institutions' (organisations or actors) and the role of 'institutions' that pattern behaviour, however, we need to clarify this distinction more profoundly. We follow the well-known definition by Douglas North: if institutions are the rules of the game in society, organisations or actors are the players (North, 1990:4). To be able to analyse the complex interaction between institutions and actors, the two have to be analytically distinguished. In our study, actors in the analysis are the wind power entrepreneurs and other stakeholders involved in the wind power supply market. Stakeholders encompass both individuals and collectives. A stakeholder is defined as any group or individual who can affect or is affected by the installation of wind turbines, the main categories being market actors such as (renewable) power generators and suppliers, central, regional and local governments, and organised social interests such as residents and environmental organisations. Dynamics in these categories of stakeholders determine to a greater or lesser extent the development of the wind power supply market. Government policy processes lead, for instance, to the adoption of new financial incentive schemes or building permit procedures. Innovations by market actors, such as wind turbine manufacturers, improve the economic performance of wind turbines, and environmental organisations may actively search for suitable locations for wind power projects.

2.3.3 Formal and informal institutions

The distinction between informal norms and formalised norms requires further attention. Following Coriat and Weinstein (2002), we make a distinction between formal and informal institutions. Formal institutions are explicit rules, imposed on all stakeholders by top-down decision making procedures. Enforcement is guaranteed by a system of sanctions that make the rules of the game operational. Governments create these formalised institutions at four interconnected administrative levels. At the highest level the EU sets boundary rules. Examples are European Directives, such as the Habitats Directive (92/43/EC) or the Directive on electricity production from renewable energy sources (2001/77/EC). The first directive requires member states to take measures to maintain or restore the natural habitats of species of wild flora and fauna as defined in the directive. Requirements set out in this directive must be taken into account in the planning of wind power projects. The second directive sets indicative targets for each member state regarding electricity from renewable energy sources. For the Netherlands, the directive prescribes an indicative target of 9% for the share of renewable electricity in 2010. At the national level, strategic electricity policies and instruments are developed to stimulate wind power production, alongside policies and instruments in other relevant fields such as land use policy and law, environmental policy and law and nature conservation policy and law. At the

regional and local levels, the 12 provinces and 467 local authorities in the Netherlands produce memorandums and policy documents in line with these national level institutional conditions. Provinces, for instance, create a regional land use plan and municipalities create a municipal land use plan or a local memorandum on energy. These government rules set the margins of 'lawful' behaviour. They converge at the operational level of implementation and constitute the institutional framework within which wind power entrepreneurs and other stakeholders involved in wind power implementation operate.

Every system of government rules is an accumulation of new rules added to older ones. The rules also mutually influence each other (Clemens & Cook, 1999; Coriat & Weinstein, 2002:284). In our study, we call these government rules *institutional conditions*.

Stakeholders may use this more or less coherent system of rules strategically, according to their own motives, preferences and interpretations, thereby generating implicit rules of the game or informal institutions. This brings us to our description of social conditions. Implicit rules or informal institutions emerge from stakeholders' interactions and may complement or challenge formal rules. We call the ways in which different stakeholders deal with prevailing institutional conditions *social conditions.* Social conditions are actions of and cooperation or competition between the various stakeholders. These actions reflect their interests, strategies, resources and power positions.

Because implementation entails interaction between stakeholders, part of the variation in entrepreneurial performance can be accounted for by analysing the effects of social conditions on entrepreneurial performance. Support from citizens living nearby or willingness on the part of a municipality to co-operate in the planning of a project may, for instance, depend on the type of investor.

There is no clear line separating social conditions that generate informal institutions and institutional conditions. Collaborative behaviour is a social condition, but the more permanent it becomes, the more it acts as an institutional condition: solidified behaviour generates more or less formalised rules of the game. How do we deal with this twilight zone between social and institutional conditions? When is behaviour solidified enough to be included in the configuration of institutional conditions? We have chosen to solve this analytical problem by considering all non-formalised behaviour, regardless of its solidified status, as part of the framework of social conditions.

Summary
This section served to define our analytical perspective and the concepts of *institutional conditions, social conditions* and *wider societal context.*

- *Institutional conditions:* explicit formalised rules imposed on all stakeholders by top-down decision making procedures, such as formal definitions of renewable energy, the Electricity Act, the Spatial Planning Act and the Environmental Management Act. Enforcement is guaranteed by a formal system of sanctions that makes the imposed rules operational. The framework of institutional conditions that is relevant for the development of the wind power

supply market encompasses four policy fields, i.e. energy policy and law, land use policy and law, environmental policy and law, and nature conservation policy and law.

- *Social conditions*: the ways in which different stakeholders deal with prevailing institutional conditions. Social conditions are actions of and cooperation or competition between the various stakeholders involved in accordance with their interests, strategies, resources and power positions.
- *Wider societal context:* broad socio-economic structures defining the parameters of social order at its broadest level. These conditions influence the feasibility of wind power projects but cannot be influenced by stakeholders in the wind power implementation.

2.4 Implementation capacity as a central concept

In this study we have focused on the investment behaviour of wind power entrepreneurs and their actions to install wind turbines. The actual results of this behaviour, in terms of the amount of wind power capacity actually implemented, is analysed using the concept of *implementation capacity* (IC). The concept of IC is used as a qualitative variable, which enables us to describe and explain differences over time in the performances of different types of entrepreneur. We assume that the IC is determined by the sum of the relevant economic, technical, institutional and social conditions and mutual interdependencies. These conditions affect the decisions made by entrepreneurs on whether to make investments in wind power and determine the possibilities for entrepreneurs to actually implement wind power projects. Every type of condition is necessary but not in itself sufficient for implementation. A project may be technically feasible, but it must also offer economically viable prospects for exploitation. In addition, an operational institutional structure is required to get a project implemented. A transition from a large-scale centralised fossil fuel-based electricity supply system to a more sustainable electricity supply system based on renewable sources such as wind energy requires changes in these conditions; changes that favour investments in wind power projects. Governmental policy is supposed to direct these changes and so mobilise capital to achieve the full potential of wind power technology.

Graphically, our research model can be represented as follows:

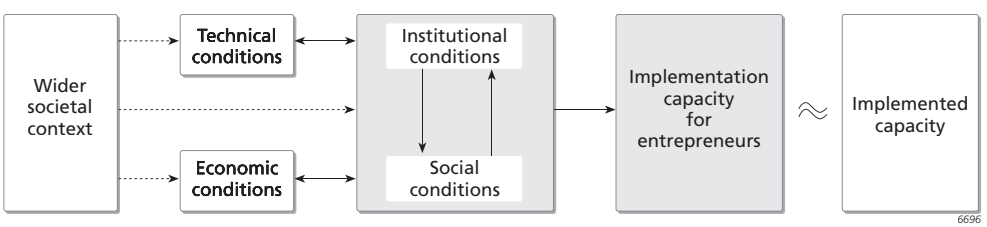


Figure 2.1 Implementation capacity: the capacity for wind power entrepreneurs to implement wind turbines.

This conceptual model defines the area of our fieldwork. It gives an overall impression of the units of analysis and the relationships between them. In other words, how we look at reality. Research based on this model aims for specification of the illustrated relationships.

To analyse (changes in) implementation capacity, our research specifically focuses on two groups of conditions and their interdependencies (shaded in grey in figure 2.1):

The first group of conditions is the group of social conditions. Attention focuses on the interactive nature of the preferences and behaviour of wind power entrepreneurs and other stakeholders involved in wind power implementation.

The second group of conditions is the group of institutional conditions. Attention focuses on the constellation of rules that structure the interactive behaviour of actors and determine the opportunities and constraints for wind power entrepreneurs.

Third, our research focuses on the interdependencies between institutional conditions and social conditions. Attention focuses on changes in institutional conditions and on the consequences of these changes for investment behaviour and the possibility to implement wind turbines.

We will study the effect of these conditions and their interactions on investment behaviour and on the operational process of realising wind power projects. This process can be described on the basis of the successive steps that need to be taken to bring a wind power project on line. The main steps are:

1. Feasibility study: site screening and selection
   (wind resource assessment, investigation of potential institutional bottlenecks and financial feasibility);
2. Land ownership
   (securing land ownership or leasing arrangements for the project);
3. Spatial planning procedures
   (request for exemption or revision of the Municipal Land Use Plan);
4. Environmental studies
   (Environmental Impact Assessment);
5. Licensing procedures
   (Construction, Environmental and Nature Conservation Permit);
6. Construction, contracting and investment phase
   (financing, invitation to tender for kilowatt-hour remuneration, purchase of turbines, contracting for construction, contracting for connection to grid).

These steps are determined not only by national strategic energy policies and instruments developed to stimulate wind power production, but also by policies and instruments in other fields such as land use, the environment and nature conservation. These policies and instruments from different policy fields converge at the operational level of implementation and constitute the institutional framework within which wind power entrepreneurs and other stakeholders involved in wind power implementation operate. Energy policies and instruments developed to stimulate wind power generation focus mainly on reducing the difference between the costs of

wind power and fossil fuel-based electricity generation and thus encouraging investment. Actual implementation, however, takes place amidst the restrictions imposed by other policy fields. These policy fields are primarily concerned with preserving qualities that are not protected by the market, such as scenic quality, wildlife values and low noise levels.

In this perspective we further assume that the effects of the wider societal context and the economic and technical context become visible in the social and institutional conditions. The wider societal context and the economic and technical conditions are reflected in the knowledge base and perceptions of the investors in the market and in this way indirectly influence their behaviour.

For instance, oil shortages due to geopolitical tensions may lead to higher electricity prices, hence inducing efforts to improve the technology of power generation, and to the creation of new and favourable conditions for energy saving and the use of renewable electricity technologies. Economic conditions, such as the purchase price of turbines and the costs of infrastructure, connection to the grid, financing and planning, and the proceeds from the sale of electricity influence the financial risk of an investment in a wind power project. Entrepreneurs will weigh these costs and benefits before deciding whether to invest.

Political decisions are also based on knowledge about prevailing economic conditions. In 2004, the Ministry of Economic Affairs contracted two Dutch research institutes to assess the financial viability of different renewable electricity generation technologies. The ministry used these economic assessments to determine the level of the MEP[1] subsidies required to bridge the difference between generation costs and market price for each renewable electricity generation technology (IEA, 2004).

A final example concerns technological developments. Twenty years ago turbines had a capacity of just 25 kW. Today, they range in size from 750 to 4000 kW. Large multi-megawatt turbines with 80-metre rotors are placed on towers 70 to 100 metres high. One of the consequences of these changes in technical conditions is that Dutch provincial and local authorities increasingly demand that turbines are clustered. Installation of solitary turbines is no longer allowed. This change in the institutional conditions implies a change in social conditions: the demand for clustering almost automatically signifies the involvement of more than one landowner in wind power projects. Cooperation between landowners becomes a prerequisite.

2.5 Research strategy

For our analysis of investment behaviour and actions to implement wind turbines we need to analyse the changes in institutional and social conditions and their interactions. In the remainder of this chapter we discuss the research strategy that we adopted to analyse these changes and the effects of these changes on the emergence and performance of wind entrepreneurs. There were three distinct empirical steps in the analysis: (1) a market analysis, (2) case studies and (3) validation workshops. We will elaborate on these steps in this and the following sections.

The first step is a general analysis of the development of the Dutch wind power supply market. The general analysis comprises a market analysis and a description of developments in institutional conditions. The market analysis is a quantitative analysis in terms of the patterns of implementation displayed by different types of entrepreneurs active on the Dutch wind power supply market over the period 1989-2004. These implementation patterns comprise four elements:

- number of turbines installed
- number of projects installed
- capacity installed (MW)
- location of projects/geographical distribution of investments

The description of developments in the institutional conditions enables us to analyse the correlation between changes in these conditions and the emergence and performance of different types of wind power entrepreneurs. One such development was the adoption of the first National Environmental Policy Plan (NEPP) in 1989, which contained CO_2 emission targets for different industrial branches and economic sectors. It stimulated wind power production by energy distributors at the beginning of the 1990s. Another example is the liberalisation of the green electricity market in 2001, which created opportunities for decentralised wind power producers. As a consequence, a number of new wind power entrepreneurs entered the market.

Data obtained from the general analysis were insufficient to determine the importance of institutional conditions created by the 12 Dutch provinces and the 467 municipalities or the social conditions at the operational level of implementation. To complete our analysis, we incorporated these conditions in our case studies on the performance of specific types of entrepreneurs.

2.6 Case study research

The speciality of case study research is that a social phenomenon is studied in a real-life context (Yin, 1994). To understanding the phenomenon a number of mutually dependent variables or pieces of evidence have to be integrated. The case study approach is an accepted method in environmental policy studies to study policy processes in relation to the institutional context. The method enables us to learn more about the influence of the context on the behaviour of actors within that context (Verschuren & Doorewaard, 1999). This is also applicable to our study. We cannot study investment behaviour and the performance of wind power entrepreneurs within an experimental setting under controlled conditions. Moreover, a case study requires less pre-structuring than an experiment, which makes it easier to change course during the research project. This can be important in rapidly changing or dynamic situations like the development of the wind power supply market.

Several variants can be distinguished within the case study approach. A common distinction that is made is between a single case study design and a multiple case study design. In a single case study design, only one case is thoroughly examined. There are various reasons for choosing a single case study design. The case in question may be considered unique or highly revealing for an understanding of a phenomenon, or it may be a critical case in testing a theory (Scholz & Tietje, 2002). In a multiple case study design, several interrelated cases are compared. This is

especially useful when many interdependent explanatory variables are included in the analysis. Each case in a multiple case study design is based on a singular combination of circumstances serving a specific purpose within the overall scope of inquiry (Yin, 1994). We have opted for a multiple case study design. The cases are the performance over time of different entrepreneurial groups. The cases are studied independently of each other. The results are used to explain the emergence and performance of different types of entrepreneurs and to make a comparative analysis of the four entrepreneurial groups. In this way we can determine the importance of social and institutional conditions for the development of the wind power supply market.

We are aware that the evidence in case study research depends not only on theoretically tested empirical evidence of causality but also on the valid interpretation and argumentation of the researcher. In our study, this interpretation is always based on multiple methods and sources of evidence. This is called triangulation of methods and sources and improves the robustness of the results (Verschuren & Doorewaard, 1999). The next subsection describes the research strategy, the methods and sources of evidence used in each case.

2.6.1 Strategy per case

The selection of the cases is empirically driven. It is based on the general analysis of the wind power supply market over the period 1989-2004. This quantitative analysis shows that we need to distinguish at least four different types of entrepreneurs. These entrepreneurial groups are:

1. *Small private investors* (mainly farmers): Wind power exploitation is a supplementary income for this entrepreneurial group. Their core business lies outside the energy sector.
2. *Electricity sector* (energy distributors): Wind power exploitation is a small but growing business component for these companies. Their core business is producing and selling a portfolio of (renewable) energy sources.
3. *Wind cooperatives*: For this entrepreneurial group wind power exploitation is not a means of making money but a means of working towards a sustainable society.
4. *New independent wind power producers:* (NIWP) Wind power exploitation is a (new) part of their core business, which is most likely related to the renewable energy sector.

We employed somewhat different research strategies to study the emergence and performance of these four entrepreneurial groups. Each case study consists of at least six of the following steps:

1. Analysis of the number of entrepreneurs to emerge in the market.
2. Analysis of the performance of these entrepreneurs in terms of turbines, projects and total capacity installed.
3. Analysis of the geographical distribution or concentration of investments.
4. Analysis of lead-times and bottlenecks encountered during the implementation of wind power projects.
5. Analysis of those entrepreneurs, who are unique/revealing within the entrepreneurial group concerned. Analysis of the strategies and performance of these entrepreneurs.
6. Analysis of the effect of social and institutional conditions at national level, i.e. changing legislation, changing financial incentive schemes and strategies chosen by entrepreneurs over the whole research period 1989-2004.

7. Analysis of the effect of social and institutional conditions on the operational process of implementation through selection of wind power implementation processes that are either representative or unique/revealing for the entrepreneurial group concerned. We carried out a stakeholder analysis within the selected wind power implementation processes. A stakeholder analysis is a useful tool because of its emphasis on explaining and predicting how an entrepreneur functions with respect to the relationships and influences existing in its environment (Rowley, 1997). The method is designed to identify the main actors involved in a particular policy problem, their interests in relation to the policy problem, their position and relationships to other actors and the resources they control (Grimble, 1998; Rowley, 1997).

The first six steps are the same for all cases. Energy distributors and small private investors have dominated the wind power supply market during the last 15 years. For these two entrepreneurial groups we also carried out stakeholder analyses of concrete wind power implementation processes.

For energy distributors, we analysed the local performance of the regional energy distributor in the municipality of Zeewolde in the province of Flevoland. Zeewolde hosts a large-scale wind power project, owned by the regional energy distributor. The implementation process of this project started in 1989 and the project became operative in 1998. We selected this project because of two characteristics. First, its scale: large-scale applications are representative for energy distributors. Second, its lead-time: the long lead-time of the project enabled us to carry out a longitudinal analysis of the changes in social and institutional conditions and the effects of those changes over a considerable part of the research period (the research period covers the development of the market between 1989 and 2004).

For the case study involving small private investors we also analysed the performance at the local level in the municipality of Zeewolde in Flevoland. The selection of the same local administrative context enabled us to compare the performances of the energy distributor and small private investors in exactly the same social and institutional setting. Moreover, the province of Flevoland is a revealing case. At the beginning of the 1990s most of the total installed capacity of small private investors was located in just three provinces, i.e. Friesland, North Holland and Flevoland, and predominantly in Friesland. However, whereas the role of Friesland diminished in the course of the 1990s, the role of Flevoland grew. This province currently accounts for some 40% of the total national wind power, most of it realised by small private investors. The relatively rapid growth and the extent to which farmers came to dominate the wind power supply market in Flevoland are out of line with national developments. Understanding the conditions that influenced these atypical developments gives us a clear opportunity to learn about opportunities and bottlenecks for wind power implementation in general. The municipality of Zeewolde is an appropriate choice because the pattern of wind power implementation in this municipality resembles the pattern in the development of wind power in Flevoland as a whole.

To verify that the results of the two stakeholder analyses were not exceptional within these groups of entrepreneurs we tested them in interviews with project managers of different energy distributors and with representatives of different regional associations of private wind turbine owners. Moreover, the results of the analysis of the performance of small private investors were

also tested against the results of a survey that we conducted amongst members of the Association of Wind Turbine Owners in North Holland (see subsection 2.6.2).

2.6.2 Data gathering in the cases

We used quantitative and qualitative methods for data gathering. The data and data gathering techniques that were used in the cases are the following.

Written materials

A variety of written materials were analysed. We consulted policy studies that aimed to forecast the production of renewable electricity in the Netherlands, scientific articles, legislation, policy documents on (renewable) energy, the environment and spatial planning, conference proceedings, press releases, articles in popular magazines and web sites. Sometimes we were able to use the personal archives of actors involved in concrete wind power projects. Twice we had to call upon the Government Information (Public Access) Act to obtain data on decision making procedures or permit applications[2].

Quantitative data on the number of projects, turbines and installed capacity were based on the KEMA Wind Monitor, a statistical database, complemented by data from Wind Service Holland. Until 2003 KEMA registered the energy yields of Dutch wind turbines on behalf of Novem, which is an agency of the Ministry of Economic Affairs for implementing policies on innovation, energy and climate. Wind Service Holland is a consultancy in the field of wind power implementation.

We used these materials to obtain an overview of the development of the wind power supply market in the 1990s and of changes in institutional conditions.

Interviews

We conducted interviews with key actors on the Dutch wind power supply market and stakeholders involved in specific wind power projects. Interviews were conducted with senior policymakers at different ministries, civil servants at both provincial and municipal levels, different wind power entrepreneurs, renewable energy consultants, and representatives of umbrella associations of wind turbine owners or citizen groups. For an overview of interviews that were conducted (personal communications, telephone conservations or email communications) see appendix 2.1.

Interviews provide detailed information with a real-life character. A disadvantage is that the technique relies on the informant's willingness and ability to give accurate and complete answers. The informant may have a selective memory or may not have sufficient knowledge of the topic. This may influence the validity and reliability of the data, which is something we tested by asking different actors about the same event and by triangulation.

Most of the interviews were conducted in person and took an hour and a half. Sometimes we communicated by telephone or email. Not all actors on the wind power supply market could be interviewed. The actors were selected in the first place on the basis of a general orientation in the empirical field obtained by analysing written materials, and in the second place on the basis of information provided by the interviewees themselves (the 'snowball technique'). The

interviews were semi-structured, with a list of topics based on variables in the conceptual model. The interviews were recorded and then written up to ensure no information was lost.

One of the fundamental discussions in social science concerns the discrepancy between observational units and research units. The use of data from interviews in our study does not imply that we focused solely on the behaviour of individuals. On the contrary, our aim was to produce knowledge about the behaviour of wind power entrepreneurs, government authorities and organised social interests actively involved in wind power implementation. Hence we focused on the behaviour of organisations as represented by the individuals interviewed. This implies that we assume that individuals can adequately express the motives, interests and decisions of an organisation. One, and sometimes two, individuals were interviewed for each organisation (research unit). Individuals were selected who were involved in the policy field or wind power project under scrutiny. We tried to increase the reliability of the interview data by testing it against written materials of the research unit and against other interviews concerning the same policy field or project.

Surveys

At the start of our study we conducted an exploratory survey amongst energy distributors, new independent wind power entrepreneurs and consultants to obtain information about:

- the year when an entrepreneur had started its activities on the wind power supply market,
- the number of projects and total capacity realised,
- the ownership of the capacity,
- collaboration between entrepreneurs and other actors.

We also asked some questions about future projects and projects in progress. Respondents displayed great reluctance in answering these questions. The questionnaire was distributed by email to 28 entrepreneurs in the period October to December 2001. The response rate was 71% (see appendix 2.2). The information from the questionnaire was used to crosscheck data from KEMA and Wind Service Holland and to gain an insight into the time at which different types of entrepreneurs had emerged on the market.

For the case study 'small private investors' we conducted a survey among members of the Association of Wind Turbine Owners in North Holland (*Vereniging van Wind turbine eigenaren in Noord Holland*). The questionnaire was distributed to 66 members of the association at a general meeting held in December 2002. The response rate was 63%. We used the questionnaire to obtain information about lead-times and bottlenecks encountered during the implementation of wind power projects. Questions were asked about ownership, participation of third parties, use of consultants, local policy, planning and licensing procedures, connection to the grid and the use of governmental financial schemes. We asked respondents to fill out Likert scales indicating the extent to which a potential bottleneck had been problematic for their own situation. By using Likert scales we ran the risk of obtaining ceiling effects. To reduce this risk the respondents were asked to rank the bottlenecks presented to them in order of importance. We asked them to rank the three bottlenecks that had caused most problems and the three that had been least problematic. Ranking the problems in order of importance forced the respondents to make choices.

For the case study involving 'wind cooperatives' we conducted a survey among 14 wind electricity cooperatives. Each cooperative was asked to complete three questionnaires: one about a wind power project which was carried out before 1998; one about an ongoing project or a project that had been recently completed; and one about a project that could not be implemented. The questionnaires were distributed in December 2004. Although the response rate by the cooperatives was 100%, most of them did not complete all three questionnaires. Information that was required to fill in the questionnaires was sometimes unavailable because the person who had been involved in the project was not an active member any more. In addition, the questionnaires turned out to be inapplicable in some cases. For instance, only six cooperatives had recently completed wind power projects. In total we received 20 questionnaires, 12 about projects realised before 1998, six about projects that had been recently completed and two about projects that could not be implemented. We used the questionnaires to obtain information about lead-times and bottlenecks encountered during the implementation of wind turbines during different periods. Questions were asked about ownership, participation of third parties, use of consultants, local policy, planning and licensing procedures, connection to the grid and the use of governmental financial schemes. We asked respondents to fill out Likert scales indicating the extent to which a potential bottleneck had been problematic for their own situation. To reduce the risk of obtaining ceiling effects the respondents were asked to rank the bottlenecks presented to them in order of importance. We also asked the respondents for their opinions about provincial and national wind power policy and instruments and about the liberalisation of the market (see appendix 2.3).

Participant observation
We also used participant observation, not for a particular case study but to gather general information about the wind power supply market. Twice a year in the period 2001 to 2004 we attended the seminars of the Dutch Wind Energy Association *(Nederlandse Windenergie Vereniging)*. This association is a branch organisation whose members include individuals and organisations or companies, among them energy distributors and new independent wind power producers. We attended some general meetings of members of the cooperative Zeeuwind, and the Association of Wind Turbine Owners in North Holland (*Vereniging van Wind turbine eigenaren in Noord Holland*). We also attended public information meetings organised by local or provincial authorities and several renewable energy conferences for governmental authorities and other actors involved in wind power supply.

2.7 Validation workshops in an Electronic Board Room

We conducted validation workshops in an Electronic Board Room to discuss the results of the case studies and to generate new ideas for future wind power policy. An Electronic Board Room (EBR) (hardware) with a Group Support System (GSS) (software) is an interactive, computer-based system that allows participants to communicate on unstructured and semi-structured problems. We used the GSS to discuss the importance of social and institutional conditions in the operational process of realizing wind power projects and to vote on statements concerning the importance of these conditions. It enabled us to test insights derived from the case studies and so increase the robustness of the results of those studies.

We conducted two workshops with different types of wind power entrepreneurs and one workshop with civil servants from provincial and local authorities. The workshops took place on 26 April, 28 April and 12 May 2005. The decision to zoom in on local civil servants stemmed from the fact that in the Netherlands planning decisions regarding wind power implementation are the responsibility of local councils. Moreover, the municipal council is the competent authority in several licensing procedures. Ultimately, therefore, implementation takes place at the local government level.

The workshops covered the degree to which social and institutional conditions in the operational process of wind power implementation affected the development of the market. The workshops furthermore served to reveal differences in the perceptions of wind power entrepreneurs and local authorities. Chapter 8 includes information about the methodology of the Electronic Board Room and a description of the methodological steps undertaken in the workshops. It also discusses the results of the workshops and the general applicability of the results.

2.8 General applicability of results

To improve the internal validity of the case studies we used triangulation of methods and triangulation of sources (see previous sections). Verifying the general applicability of the results of the case studies was somewhat more problematic. Analysing just a few wind energy planning processes in which the number of variables exceeds the number of data points hinders the possibility of declaring the results applicable to all wind power planning processes. Although statistical generalisation is not possible, analytical generalisation is. Results from case studies can be generalised in qualitative terms. They provide information about processes that underlie the relationships between conditions and the circumstances under which these processes take place. It can be argued that similar processes will take place under similar circumstances. However, conclusions must be drawn cautiously and their value depends on the plausibility of argumentation. Plausibility can be increased by careful selection of the case studies and by using triangulation of methods and sources.

We increased the general applicability of results in the following ways:

- The analysis of different cases was driven by the conceptual model and concrete wind power planning processes were analysed according to an established pattern;
- we compared the results of the cases systematically in terms of causal mechanisms;
- we tried to formulate conclusions at a level of abstraction that disregarded specific circumstances in concrete cases;
- we compared the results of the cases with existing literature on the situation in both the Netherlands and in other countries;
- we used validation workshops to determine whether the results have a more general value and to determine the importance of explanatory conditions.

Notes

1 MEP stands for 'environmental quality of power production'.

2 In February 2002 we used this procedure to obtain the names of applicants for a Waterways and Public Works Act permit, which was required for offshore wind power projects. In 2004 we used this procedure to obtain formal documents with regard to the administrative decision making process concerning the assignment of the Nature Conservation Permit in 1997 for the building of a wind power project on the Eemmeerdijk. The Eemmeerdijk is a dike on the municipal border of Zeewolde separating municipal land from the Eemmeer Lake.

3 Changing roles and positions of actors on the Dutch electricity market and in wind power supply

3.1 Introduction[1]

Before discussing the case studies, we will present a short history of the roles and positions of actors on the electricity market. We distinguish two different periods: (1) the electricity market before liberalisation, and (2) the electricity market in a liberalised setting. There are three main categories of actors: generators, suppliers and consumers. We will show that the positions of these actors and the essence of their relationships have changed and that new actors have emerged due to changes in social and institutional conditions.

The number and types of electricity generators have increased over the past 15 years, with a clear distinction between actors involved in large-scale generation and actors involved in decentralised generation. We will see that traditional suppliers or energy distributors have extended their activities to enter into decentralised generation. In addition, there was a strong concentration of traditional suppliers or energy distributors during the 1990s and new types of (green) suppliers have emerged at the beginning of this millennium. The role of consumers has changed dramatically. Whereas during the 1990s most consumers were captive, they have gradually been given the freedom to choose their own electricity supplier since the liberalisation of the sector commenced in 1998.

In addressing the positions of these main categories of actors and their essential relationships, special attention is paid to wind power generation. The various groups of wind power entrepreneurs have to deal with developments in the electricity market and in national electricity policy. They also have to deal with developments in other policy fields, such as land use, the environment and nature conservation. These policies converge at the operational level of executing wind power projects and constitute the institutional framework within which wind power entrepreneurs and other stakeholders operate. These further institutional conditions are described.

Finally, we conclude with a description of three successive market periods for wind power supply.

3.2 The Dutch electricity market before liberalisation in 1998

3.2.1 Dominance of large-scale electricity generators

In the 1980s the electricity market was characterised by a monopolistic and fragmented market structure. A large number of electricity companies had administratively integrated businesses,

including electricity generation, high-voltage transmission, low-voltage distribution and supply to end users. These companies were owned and controlled by provincial and municipal authorities (Slingerland, 1999: 3-11). The 1989 Electricity Act attempted to streamline the fragmented electricity generation with the aim of achieving efficiency gains. It separated large-scale electricity production, decentralised electricity production and electricity supply or distribution. After the separation five large power producers were formed and a merger one year later resulted into four public electricity generators[2]. Large-scale generation was limited to these four public electricity generators, which cooperated in the Association of Electricity Producing Companies (*Samenwerkende Electriciteits Producenten – SEP*). The SEP held a central and powerful position in the market. It was the only actor allowed to import electricity and it coordinated large-scale electricity production. During this period the SEP decided on the transport tariffs and the maximum tariffs that the electricity generators could charge suppliers. In addition, every two years the SEP published an electricity plan with forecasts of the demand and supply for the coming ten years. The electricity plan and the tariffs had to be approved by the Minister of Economic Affairs (Damme van, 2005).

3.2.2 Electricity suppliers in decentralised generation

The separation of large-scale electricity generation and supply led in the first place to a strong concentration of suppliers, and secondly to the emergence of strategic joint ventures between suppliers and industries.

The 1989 Electricity Act gave energy distributors or suppliers the legal position of public limited companies, which gave them greater independence to formulate their own policy (Slingerland, 1999). They were licensed and each had a monopoly on supply in its own territory. They were allowed to buy electricity from one of the four large-scale electricity generators. This however did not create much competitive pressure: electricity prices were uniform due to the cooperation in the SEP (Damme van, 2005). Distributors tried to strengthen their position in relation to the SEP through mergers and clustering of their interests. They started to expand their activities beyond their traditional domains (entering into gas supply, waste management and telecommunications) and the number of distributors dropped from 70 in 1985 to 35 in 1995 and to 20 in 2002[3] (Slingerland, 1999).

Energy distributors were not allowed to exploit large-scale production capacity or to import electricity, but they were allowed to exploit their own small-scale production capacity up to a maximum of 25 MW. This maximum of 25 MW did not apply for industrial self-generators. Consequently, distributors frequently established joint ventures with industries to exploit decentralised capacity above 25 MW. Simultaneously, decentralised co-generation became very attractive due to financial encouragement by the national government in the context of energy saving and environmental policy. This led to surplus capacity in the first half of the 1990s: installations of 'decentralised' co-generation plants with a capacity of 500 MW, owned by joint ventures of energy distributors and industries were not unusual in those days. Due to the emergence of these new strategic alliances between energy distributors and industries, decentralised capacity doubled between 1990 and 1995. In 1997, decentralised electricity production amounted to 27% of total electricity production. This eroded the power of the SEP (Damme van, 2005; Hofman & Marquart, 2001).

3.2.3 Electricity consumers

The freedom of consumers in the period before liberalisation was restricted. Energy distributors and large industrial customers were allowed to buy electricity from one of the four large-scale electricity generators. The remaining customers, i.e. industry, small and medium sized companies and households, were 'captive'. They obtained electricity from a licensed distributor.

3.3 The position of green (wind) electricity before liberalisation in 1998

Which actors went to work on the exploitation of wind energy in the rather monopolistic electricity market and what position did they occupy? There was no independent market for green electricity, yet we will show that wind power exploitation by different types of entrepreneurs (especially energy distributors) was stimulated by developments in energy policy and law and environmental policy and law.

3.3.1 First initiatives with wind power

Although the first investors in wind energy were private investors -mainly farmers- one of the fundamental decisions of the Ministry of Economic Affairs was that wind power capacity should preferably be installed by large electricity companies (Wolsink, 1996: 1084-1085). At the beginning of the 1980s, the Ministry of Economic Affairs agreed to the construction of a large-scale pilot wind power project as a test facility. The Association of Electricity Producing Companies (SEP) and the large-scale electricity generators were very sceptical about wind energy, but at the insistence of the Ministry of Economic Affairs they became involved in this pilot project and even agreed to pay half of the estimated costs. SEP undertook the development and planning of the project in close cooperation with KEMA, the research organisation of the electricity sector. The turbines were erected in 1987, but technical problems meant that the turbines were only working for an extremely small percentage of the time. The main reason why the project failed was the requirement that SEP had to completely fit the project into the national system of a reliable electricity supply. The pilot project was SEP's final involvement in decentralised (wind) electricity generation. Since then, decentralised production has been left to distributors and private producers (Jong de, Weeda, Westerwoudt, & Correljé, 2005; Kamp, 2002).

Wind power became economically more attractive after the introduction of investment subsidies for wind turbine buyers in the second half of the 1980s (amounts ranging up to 30-40% of investment costs). As well as some idealistic home builders and farmers, a new group of actors entered the wind power supply market at the end of the 1980s and beginning of the 1990s. They were the energy distributors, cooperatives and some private investors.

3.3.2 A central role for energy distributors in financial support

The investment subsidies that were gradually introduced from the end of the 1980s attracted a new group of private wind power producers. These private wind power producers were obliged to sell their electricity output to the regional energy distributor. Energy distributors were in turn obliged (1989 Electricity Act) to purchase all the electricity generated by private (wind) power producers located in the area in which they had monopoly on supply. This obligation was imposed regardless of the amount of electricity offered and for an indefinite period. The

act provided that energy distributors had to pay 'the *most stimulating compensation*' for renewable electricity. The methods for calculating the tariffs were set out in the 'Standard Arrangements for Redeliveries' (SAR) in the 1989 Electricity Act (article 49) and were revised annually. The production costs of large-scale power producers using fossil fuels were used as a reference point for these standard calculation methods, which created unfavourable prices for intermittent decentralised sources such as wind. The calculation methods included two price components: fuel costs and capacity costs. The first component was based on avoided costs for base-load fuels. The second component had two price levels: one for generators with no uncertainty of continuity and capacity of supply and one for intermittent sources, the latter being the much lower price[4] (Dinica & Arentsen, 2001: 36-45).

The lengthy tradition of interrelatedness between the Ministry of Economic Affairs and the state-owned electricity sector set the tone in electricity policy developments in the first half of the 1990s. It was characterised by a collaborative approach to policy making through voluntary agreements between the central government and the energy distributors, giving energy distributors an especially powerful position with respect to financial support for wind power. The position of wind power generation improved due an important institutional change: the publication of the first integrated National Environmental Policy Plan (NEPP), which was signed by four ministers[5] in 1989. The NEPP marked a change in the strategy of environmental policy making in the Netherlands. Environmental policy identified economic sectors as 'target groups' and policy was translated into specific goals and policies at sector level (Glasbergen, 1998). The NEPP contained CO_2 reduction targets for the electricity sector. In keeping with the NEPP, voluntary agreements were made between the government and energy distributors. The result was a covenant, the Environmental Action Plan (*Milieu Actie Plan – MAP*) for the electricity sector (EnergieNed, 2001). Energy distributors committed themselves to a target that renewable electricity would account for 3.2% of electricity sales in 2000. The MAP was adopted in 1991 and was evaluated and adapted in 1994 (MAP II) and in 1997 (MAP 2000) (Jong de et al., 2005: 141-143).

By imposing a 'MAP levy' on consumer tariffs, energy distributors were able to support the generation of renewables such as wind power. The exact level of this levy was set annually by the Ministry of Economic Affairs and varied from 0.5% to 2.5% of the maximum regional consumer tariff[6]. The Ministry of Economic Affairs, on the recommendation of the energy distributors, also set the regional consumer tariffs annually[7]. As well as energy distributors themselves, both private and industrial energy generators could apply for investment and production subsidies from the MAP levy.

Both the Standard Arrangement for Redeliveries and the MAP levy were institutional conditions with a strong element of self-regulation, giving energy distributors a special power position: energy distributors decided on the distribution of the MAP subsidies, and the actual conditions for the payback tariffs had to be agreed on a case by case basis by a regional energy distributor and a potential wind power generator. Besides these two institutional conditions, the Dutch financial incentive system for green electricity consisted of various forms of direct financial support designed to stimulate market penetration on the supply side by renewable electricity. Appendix 3.1 gives an overview of the financial instruments that were applicable up to 1995. At

the start of 1996, the government financial incentive system abruptly switched from a subsidy to a fiscal system. We will elaborate on this sudden change later on in section 3.5.

3.3.3 Fragmentation of interests in the wind power sector

Three different branch organisations were created in this period. These associations had different types of members and different interests. It would be 2002 before this fragmentation in the protection of the interests of the Dutch wind energy sector started to decrease.

The FME-CWM Group Wind Energy[8] was established first in 1983. It is the Dutch branch organisation for wind turbine manufacturers.[9]

It was followed in 1989 by the Dutch Wind Energy Association (*Nederlandse Windenergie Vereniging* – NEWIN), which originally consisted of individual members who were professionally involved or otherwise interested in wind energy, such as employees of energy companies, civil servants and scientists. To raise more funds NEWIN decided to open membership to companies in 1991 at which point it became a pressure group of both individuals and companies. The original corporate members were mainly energy distributors, the Federation of Energy Distributors in the Netherlands (*EnergieNed*), and some new independent wind power producers.

The third branch organisation, the Union of Private Wind Turbine Operators (PAWEX) was also established in 1989. PAWEX was formally mentioned in the 1989 Electricity Act as the representative association for private wind power producers. Members were not allowed to be involved in the retail sale of electricity or in grid management, so energy distributors and other suppliers were excluded (Reiche, 2002: 187). PAWEX represented private wind power producers, amongst them several regional associations of private wind turbine owners and the wind department of the Dutch Organisation for Renewable Energy (ODE)[10]. ODE was itself established in the 1970s as a renewable energy pioneer's association. All Dutch wind cooperatives were represented by ODE and in that way these wind cooperatives were indirectly members of PAWEX. The different regional associations of private wind turbine owners were formed at the beginning of the 1990s: two in Friesland, one in Groningen, one in Noord-Holland and one in Flevoland[11]. These associations did not collaborate closely, although they worked together indirectly through PAWEX.

In 1992, PAWEX took an action for arbitration against the Federation of Energy Distributors in the Netherlands (*EnergieNed*) concerning the meaning of '*the most stimulating compensation*' for renewable electricity as defined in the 1989 Electricity Act. We will discuss this arbitration case in more detail in chapter 5, section 5.5.

3.4 The Dutch electricity market moving towards a liberalised setting

After the 1989 Electricity Act, a second major shift was the publication of the Third White Paper on Energy in 1996. The main policy lines in this strategic national policy document were liberalisation of the electricity sector and promotion of a sustainable energy supply. The document anticipated Directive 96/92/EC on the liberalisation of the EU electricity market. The white paper contained the first integral policy target of '10 percent renewable energy in 2020'. The target for wind energy was 1000 MW by the year 2000. These targets were developed further

in several key policy documents on renewable energy that were published in 1997 and 1999. A new 1998 Electricity Act created the legal framework for liberalisation. The main goal was to create more competition on the market by increasing consumer choice while simultaneously bringing about efficiency gains and maintaining security of supply. The wholesale electricity in the Netherlands became fully liberalised in 1998. The retail electricity market was liberalised gradually. Ahead of the full liberalisation of the 'grey' retail market, the green retail market was fully opened to competition in July 2001.

The implications of these changing policies – liberalisation of the sector and promotion of a sustainable energy supply – for the roles and positions of the main categories of actors will be addressed in this section.

3.4.1 Large-scale electricity generation

Following the 1998 Electricity Act, licences for large-scale generation were no longer needed and access to imports became open for all. The act dissolved the Association of Electricity Producing Companies (SEP), which implied the end of cooperation between the four large-scale electricity generators. Initially the idea behind the third white paper had been to merge the four large electricity producers into one large 'national champion' that could be competitive at the European level. Although the Minister of Economic Affairs and parliament encouraged such a merger in the end it did not take place because the four generators could not reach an agreement. Consequently, the intended market concentration in electricity generation failed. Since the 1998 Electricity Act, international takeovers have characterised the Dutch wholesale electricity market. Foreign companies have acquired three of the four large-scale generators[12] (Damme van, 2005). The four large-scale electricity generators have only been engaged in centralised production. In 1996 the share of central production in domestically produced electricity was 75%. The share of central production in the total electricity consumed in the Netherlands was about 60% in the years 1995, 1996 and 1997. After the market was liberalised this share fell to about 50%, but has risen again to 58% since 2002[13] (Damme van & Zwart, 2003).

Before the liberalisation of the wholesale market, the four large-scale generators and the energy distributors entered into an agreement in January 1997. They signed a protocol which closed off the wholesale market until the end of 2000. It fixed prices and quantities and producers would not conclude new contracts. The protocol provided for an 'orderly transition period' during which various institutional mechanisms to facilitate competition could be set up. Since January 2001 large-scale producers, distributors and other retailers have traded electricity on newly established wholesale markets, such as the APX spot market, or by way of bilateral contracts (Damme van, 2005).

3.4.2 New market players in supply and decentralised generation

A second wave of concentration took place among suppliers at the end of the 1990s as Dutch distributors felt the need to increase in scale to prepare for increased competition on the future European electricity market. From 2003 three large energy distributors came to dominate the Dutch electricity supply market: Nuon, Essent and Eneco have a combined market share of 87% in electricity retailing[14] (Kaal, 2001).

Although energy distributors were primarily intermediaries between generators and consumers they strengthened their positions by undertaking decentralised electricity generation in the first half of the 1990s. Since the 1998 Electricity Act allowed them to import electricity and to exploit large-scale production capacity regardless of the amount of capacity installed they no longer needed the strategy of establishing joint ventures with industries to exploit decentralised capacity above 25 MW. As early as 1994 the financial incentives for installing decentralised co-generation plants had been completely halted by major cutbacks in government expenditures on energy saving. Nevertheless, the share of decentralised capacity at the end of the 1990s amounted to 30%, which was mainly co-generation jointly owned by distributors and industries (Damme van, 2005).

Energy distributors in the liberalised setting were no longer obliged to buy electricity generated by decentralised private (wind) power producers. Vice versa, these decentralised entrepreneurs were no longer obliged to sell their electricity to the regional energy distributor. This new market situation increased the bargaining power of independent (wind) power producers. A relatively large group of small private and new independent wind power producers emerged at the end of the 1990s. These decentralised producers were not the only new players to enter the market. Despite the heavy concentration in electricity retailing new suppliers emerged at the beginning of this millennium. The emergence of these new market players – both decentralised producers and new suppliers – can be explained by the favourable economic conditions created by the 'greening' of the tax system, the liberalisation of the green consumer market in July 2001 and heavy consumer demand, as will be shown in section 3.5.

3.4.3 Freedom of choice for consumers

The retail market was gradually liberalised. In 1998 a first group of 650 large industrial consumers (33% of demand) became free to choose their energy distribution company. A second group of about 59,000 consumers (medium-sized companies representing a further 29% of demand) also acquired this freedom of choice in 2002. Since 2004 the entire electricity market has been liberalised: all consumers, including households, have the freedom to choose their own electricity supplier. Since that time the market has determined the electricity price. There has been competition in production and supply. During the phased introduction of liberalisation the price of electricity was still regulated for captive consumers. The tariff was established by the Office of Energy Regulation (*Directie toezicht electriciteit – Dte*)[15], which is the independent regulator for the electricity sector (established by the 1998 Electricity Act).

Ahead of the liberalisation of the 'grey' retail market, the green electricity market was fully liberalised in July 2001. This led to changes in the roles and positions of existing market players such as energy distributors and consumers, and it stimulated the entry of new players into the market such as green suppliers and new independent wind power producers. We will elaborate on these developments in the next section.

3.5 The position of green (wind) electricity in the new liberalised setting

Since the publication of the Third White Paper on Energy in 1996, wind power production has been stimulated by three major institutional changes in the electricity policy field: (1) the introduction of fiscal instruments created favourable economic circumstances from the end of the 1990s; (2) the liberalisation of the electricity market gave private power producers a stronger bargaining position; and (3) the liberalisation of the green consumer market in 2001 led to heavy consumer demand for green electricity. We will see that these changes led to the emergence of new market players and caused existing market players to change their strategy.

3.5.1 Changes in support

The targets in the Third White Paper on Energy were developed further in the Action Programme for Renewable Energy, which was published early in 1997. This programme, followed by the 1999 Energy Report, set out the preferred mix of policy instruments with a view to liberalising the energy market. Investment subsidies and the option of establishing a mandatory share of energy consumption for renewable energy were not felt to be feasible under free market conditions[16]. A switch to market-compatible policies and instruments was considered unavoidable. Consequently, the emphasis shifted from subsidies to the 'greening' of the tax system (Vermeend & van der Vaart, 1998). Investment subsidies were abandoned at once and fiscal instruments were gradually introduced in 1996 and 1997. Appendix 3.2 provides detailed information on these schemes, i.e. the Accelerated Depreciation Scheme on Environmental Investments (known as VAMIL), the Energy Investment Deduction scheme (EIA) and the Regulated Energy Tax (REB tax or eco tax). These fiscal arrangements benefited the investments of entrepreneurs with high profit margins more than those of entrepreneurs with lower profit margins, such as farmers. Moreover, non-profit organisations (among them energy distributors) could not avail of the fiscal arrangements. The 'Energy Investment Regulation for Non-Profit and Special Sectors' was introduced to remedy this shortcoming in 1997 (Boomsma, 2002; Dinica & Arentsen, 2001; Littel, 2002).

In July 2001 the green electricity market was the first segment of the market to be fully opened up to competition. Since then, all consumers have been free to choose their green electricity company. Simultaneously, a green certificate system[17] managed by the government came into effect to replace the informal and voluntary Green Label system that was implemented by energy distributors in 1998[18].

Imported green electricity became eligible for green certificates and the REB tax exemptions after lobbying by energy distributors (Damme van, 2005: 396). Energy distributors argued that they would not have enough domestic renewable electricity in stock to actually supply all consumers if demand was high. They warned that price increases would frustrate the emerging new green consumer market. Actually, however, the REB tax exemptions for foreign green electricity created an uneven playing field. Planned new domestic installations had to compete with cheaper renewable energy stations throughout Europe that had already been written off. Imported biomass from the Scandinavian paper industry and electricity from small-scale (< 15 MW) hydroelectric power stations in France were easier and cheaper to obtain than green electricity from newly installed domestic wind power plants. The consequence was that tax

revenues flew abroad without stimulating new green production capacity. During some months at the end of 2002 about 80% of all green electricity consumed in the Netherlands was imported (Energeia Energienieuws, 2002/2003). The Dutch government corrected this deficiency at the end of 2002 by announcing that the exemption from the REB tax for renewable electricity would be reduced by 50%[19].

In July 2003 a new system was introduced: the 'Environmental Quality of Electricity Production' (MEP) feed in tariffs. The MEP feed in tariffs is differentiated according to the renewable electricity technology. For wind, a fixed surcharge is granted for a period of 10 years or a maximum of 18,000 full load hours. MEP is only applicable to electricity generated in the Netherlands and is financed by all electricity consumers, who pay a fee per grid connection. With this partial replacement of the fiscal incentive system, the focus of Dutch renewable electricity policy shifted back to the supply side, following the example in most other European countries.

For details of all the financial instruments that were implemented in the period 1998-2004, see appendix 3.3. In the next subsection we will show that the greening of the tax system and the liberalisation of the sector created a new institutional framework within which the roles and positions of the main categories of actors would change considerably.

3.5.2 Changing roles and positions in the liberalised market

In anticipation of the liberalised and more demand-oriented system and of the expected fiscal instruments, energy distributor PNEM had, in cooperation with the environmental organization WWF, already started to offer green electricity for sale on a voluntary basis in 1995. It was the first time that electricity consumers had been treated as customers with freedom of choice. Many other distributors would follow this example. By 2000 there were 18 distributors offering green electricity to both small and large consumers who were willing to pay an additional price. The funds collected through these schemes were predominantly directed towards investments in wind turbines (Dinica, 2003: 437-439).

The liberalisation of the green consumer market in July 2001 was a critical test case for incumbents and new entrants in the electricity market, both from the point of view of marketing a commodity and of making an efficient switch for customers (ECN, 2001). Energy suppliers were able to offer renewable electricity at the same or even lower prices than those for electricity from fossil fuel sources due to a substantial increase in the REB tax between 1999 and 2002. The economic conditions for wind power had never been as favourable in the Netherlands. The favorable economic conditions, together with the liberalisation of the green consumer market, led to many new suppliers entering the market. At the beginning of 2003, there were 26 different retailers offering 28 different green electricity products active on the Dutch green electricity market. Nuon, a Dutch distributor sold 'Natuurstroom' (Natural Electricity), which consisted mainly of wind and solar generated electricity (both domestic and imported) but explicitly excluding biomass. Another Dutch distributor, Essent, by contrast, sold 'Groene Stroom' (Green Electricity) which consisted of domestic green electricity (mainly biomass) and explicitly excluded imports. Other companies used their own terms for green electricity, such as 'Eco stroom' (Eco Electricity) and 'Winduniestroom'[20] (Wind Electricity) (Agterbosch, Vermeulen, & Glasbergen, 2004).

A large number of small consumers switched over to green electricity in the period 2001-2004. At the end of 2004, 40% of all households, or 2.8 million consumers, were buying green electricity. However, of the 2.5 million consumers that switched to green electricity up to the summer of 2004 only 18% moved from their existing energy distributor (Damme van, 2005: 17).

Rapidly changing conditions in the financial incentive system and corresponding uncertainties in the market led the three national branch organisations to start cooperating in a wind network. The so-called *Windkoepel* was established in 2002. Through Windkoepel the organisations wanted to lobby jointly and react collectively to changes in policies and rules. In 2005, Windkoepel changed its name to the Netherlands Wind Energy Association (NWEA). The idea was to create a single strong national association along the lines of the associations in other countries such as the British Wind Energy Association (BWEA) and Bundesverband Wind Energie e.V. (BWE) in Germany.

3.6 A look at further institutional and social conditions

The shaping of policies and planning of the electricity sector at the national level has affected the development of the wind power supply market. New entrepreneurs emerged and shifts occurred in the relative market shares of different entrepreneurial groups. However, the subsequent steps[21] that need to be taken to bring a wind power project on line are not only determined by national electricity policies but also by policies and instruments in other fields such as land use policy, environmental policy and nature conservation policy. These policies converge at the operational level of realising wind power projects and constitute the institutional framework within which wind power entrepreneurs and other stakeholders operate. This brings numerous other players into the equation, such as government authorities at different levels, land owners, environmental organisations and local residents. Who exactly will be involved depends on the precise location and the technical characteristics of a project and on the local social constellation.

An important part of the operational process of implementation is the authorisation trajectory which, depending on the size and location of a project, consists of between three and seven different procedures. The trajectory provides for formal deliberation and participation by administrative authorities, organised social interests, market agencies and individuals. The formal trajectory for a large-scale wind power project with a capacity of more than 15 MW in the neighbourhood of a nature reserve consists of at least six different procedures and provides for formal deliberation at eight different points in time. In addition, judicial appeal is possible at seven further points in time. For a small-scale cluster of turbines with a capacity of 3 MW which is not to be situated near a nature reserve, the trajectory most likely consists of three different procedures[22] which provide for formal deliberation at two different moments and for judicial appeal at a further two points in time. Various competent authorities at different levels of government are involved in the implementation of the procedures. If the process is coordinated and managed properly authorisation takes eighteen months to two years on average. This term is prolonged by at least a year if there is an appeal to the litigation section of the Council of State. In addition, due to the time required for informal preliminary deliberations the entire authorisation trajectory can last considerably longer, often up to five or six years, with peaks of up

to more than ten years. Appendix 3.4 provides an overview of procedures applicable to onshore wind turbines.

3.6.1 Land use planning system

The dominant player with regard to (changes in) land use policy and law is the Ministry of Housing, Spatial Planning and Environment. The predominant notion of this policy field is to balance economic, social, cultural and ecological interests in planning. The legal system of spatial planning is based on the Spatial Planning Act (SPA) that came into effect in 1965 (Hajer & Zonneveld, 2000; Valk van der, 2002; Wolsink, 1996).

All three tiers of government have planning powers, which results in a system of interrelated plans, i.e. national spatial planning key decisions, provincial or regional land use plans (RLUP) (*streekplan*), municipal framework plans (*structuurplan*) and municipal land use plans (MLUP) (*bestemmingsplan*). The MLUP is the only legally binding plan in the whole Dutch planning system. Although the Spatial Planning Act lays down requirements for consistency in local and regional land use plans (planning hierarchy), the Dutch land use planning system is characterised by 'the absence of the obligation to bring spatial plans in line with the strategic plans (or key decisions) of a "higher" government'. Consensus building amongst government authorities and mutual adjustment characterise the planning process and hierarchical relations are rarely used (Hajer & Zonneveld, 2000).

If the municipal land use plan does not stipulate areas for turbines it is inadvisable to apply for permits: they will be denied because the land use plan does not provide for wind power. Consequently, an exemption or revision of the plan is required first. If local authorities do not intend to cooperate by revising the municipal land use plan a wind power entrepreneur will be left empty-handed. There are no legal instruments entrepreneurs can use to force municipal authorities to cooperate, which means they have a veto: the influence of local politics is large.

3.6.2 Environmental policy

Since the end of the 1970s, most legal land use planning systems have taken an environmental turn', which implies that the importance of environmental law for the planning of facilities has increased[23] (Davy, 1997: 47). The legal system increasingly sets environmental requirements that must be met by wind power projects. The dominant player at the national level is the Ministry of Housing, Spatial Planning and Environment and the predominant notion of environmental policy and law is to control and prevent environmental pollution. Primary instruments are environmental permits (EP) or registration requirements[24] and environmental impact assessments (EIA). The municipal executive is the competent authority responsible for issuing environmental permits. Allocation depends on legally fixed environmental and nuisance criteria, such as noise, blade shadow on dwellings, hindrance for birds and safety aspects. An EIA is required for larger wind power projects. The EIA procedure is linked to the first spatial plan in which the project is included, usually the RLUP or the MLUP. Judicial appeal against an EIA is not possible. Appellants have to oppose to the spatial plan to which the EIA is linked.

3.6.3 Nature conservation policy

Environmental and nature policies are not closely integrated in the Netherlands. The Nature Conservation Act (1967) gives a legal status to the protection of state nature reserves

and private protected nature reserves. Wind turbines cannot be built in nature reserves. A Nature Conservation Permit (NCP) is required for the installation of turbines in the direct neighbourhood of a nature reserve because of the possibility that 'external effects' will cause damage to the reserve. Acoustic research has to prove that quiet, as an essential characteristic of a reserve, is not affected by the placement of the turbines. The competent authority is the Minister of Agriculture, Nature Conservation and Fisheries[25]. Besides the Nature Conservation Act, two EU directives are relevant: the 1979 Birds Directive and the 1992 Habitats Directive. The directives prohibit the construction of wind turbines within protected areas and require a permit for the installation of turbines in the immediate vicinity of protection areas. Little attention was paid to the implementation of either directive until 1997 (Bastmeijer & Verschuren, 2003: 11-12). Although it was not conform the EU legal framework[26], observance of the directives was possible through the Nature Conservation Act or through the municipal land use plan. Observance through the application of the Nature Conservation Act with corresponding permit prevailed (Backes, 1993)[27].

In April 2002, the Law on the protection of Wild Fauna (LWF) came into effect. This law replaced several Dutch species conservation laws[28] and applies regardless of whether the specific area is a special protection area according to the Nature Conservation Act or to either of the two EU directives. The LWF translates the species conservation component of the EU directives into Dutch law with regard to all areas that are not designated as special protection areas. A statutory dispensation is required to disturb species. The Ministry of Agriculture, Nature Conservation and Food Quality is the competent authority[29].

3.6.4 Emerging opposition

Several (regional) anti-wind power groups make use of the possibilities provided by the formal authorisation process to appeal against wind power developments. The process allows anyone who feels they will be affected by the project to object at limited expense (68.07 euro for an appeal against a revision of or exemption from the municipal land use plan in 2002). Most appellants employ a wide array of arguments to oppose to wind power projects, such as the inefficiency and unreliability of wind turbines, landscape pollution, noise and shadow hindrance, the risk of bird collision, safety risks and the negative effect on neighbouring property values. However, the most common argument, and the one that is perceived to be at the bottom of the opposition, is the negative effect on the landscape.

As well as numerous local citizens' groups opposing local wind power projects, more professional and less ad hoc organisations were established towards the end of the 1990s: the foundation No Room for Trade in Wind (*Gjin Romte Foar Wynhannel – GRFW*)[30] was created in Friesland in 1996, and in Groningen the Foundation Windhoek (*Stichting Windhoek*)[31] was established in 1999. Since 2000 they have cooperated in the National Critical Platform Wind Energy (*National Kritisch Platform Wind energie* – NKPW). The aims of this platform are three-fold: (1) to provide 'objective' information on wind energy; (2) to provide an 'objective assessment' of all the consequences of wind turbines; and (3) to take measures to protect the Dutch landscape and the environment against the threat of wind energy developments. The NKPW currently acts as a national platform for information exchange and represents more than 40 local anti-wind energy groups.

As this shows, the number and types of actors involved in the wind power supply market is broader than might be expected solely on the basis of developments in the electricity policy field. The formal authorisation trajectory is fairly complex and various actors are able to influence or even block the installation of new wind power capacity. Securing sites and permits are seen to be main challenges for wind power market development, and reducing procedural and administrative bottlenecks in the operational process of realising wind power projects has been mentioned as an important element of wind power policy support in various national memorandums (IEA, 2004; Ministry of Economic Affairs, 1997, 1999; Ministry of Economic Affairs et al., 2004).

3.7 Steering strategies for planning problems

How did the government and market respond to these procedural and administrative bottlenecks? The Ministry of Economic Affairs set out the preferred mix of policy instruments with a view to liberalising the market in its 1997 Action Programme for Renewable Energy. Different categories of policy support were advocated, amongst them reducing political and administrative bottlenecks by streamlining planning and licensing procedures. The first Energy Report (1999) also explicitly stated that preference should be given to streamlining planning and licensing procedures. The second Energy Report in 2002 concluded that the development of wind power was lagging behind the government's target. Again problems with spatial planning were amongst the main problems identified. Various steering strategies have been developed at the national level to solve these planning problems. The Ministry of Economic Affairs has been the dominant player with regard to shaping and planning of these national steering strategies. They are primarily intended to improve communication and coordination between different government authorities and to solve procedural bottlenecks relating to the formal authorisation trajectory. In the following subsections we will elaborate on these strategies.

3.7.1 Bureaus for renewable energy

In 1991 the three branch organisations in the Dutch wind energy sector (see also section 3.3.3) established the National Bureau for Wind Energy (*Landelijk Bureau Windenergie – LBW*). The main purpose of this body was to put wind energy on the political agenda and to raise social support. It was a first attempt by the wind sector to create a joint lobby. The LBW started with 50% financial support from the government. Although the LBW was ultimately intended to pay its own way, the government's subsidy was raised to about 80% in 1994. From that time Novem, an agency of the Ministry of Economic Affairs, took the view that the government was in charge and decided that the Bureau should merge with the planned Project Office for Renewable Energy (*Projectbureau Duurzame Energie – PDE*). The PDE was formally established after publication of the third white paper in 1996. The main purpose of this new agency was to increase production and consumption and secure wider public support for renewable energy by organising public campaigns, by providing technical, economic and legal information and by helping local authorities to start up renewable energy projects. The PDE was financed by the Ministry of Economic Affairs (50%) and the energy sector (50%) in the shape of the Federation of Energy Distributors in the Netherlands (*EnergieNed*). The PDE was abolished in 2004 due to a lack of funding.

3.7.2 Administrative agreements

In 1991 the Ministry of Economic Affairs, the Ministry of Housing, Spatial Planning and the Environment and seven coastal 'wind abundant' provinces signed an administrative agreement. The main purpose of this Governmental Agreement on Planning Problems Wind Energy (*Bestuursovereenkomst Plaatsingsproblematiek Windturbines – BPW*) was to create sufficient locations for wind turbines through targeted spatial planning policies of national and provincial governments. The agreement was to lead to the installation of 400 MW in 1995 and 1000 MW in 2000 (Minister of Economic Affairs, 1991). The BPW fit in with the Dutch culture of 'gentlemen's agreements' without strict legal obligations. It contained a target[32] for each province that had signed the covenant. In line with the monopolistic market structure at the beginning of the 1990s, distributors were regarded as the actors that should meet those targets. Strictly speaking, the goal of the covenant was 'to identify areas suitable for the implementation of 1000 MW wind energy in the regional land use plan and to stimulate translation of these areas in concrete locations in municipal land use plans' (Duyn van, 2005: 36-37). The covenant partners perceived the goal somewhat differently: 'the actual implementation of 1000 MW in the year 2000'. This latter goal was never reached. One of the main causes for this failure was that important stakeholders such as municipalities were ignored (Novem, 1997). In 1996, regional land use plans indicated areas for about 880 MW of wind energy. By 2000, 447 MW was actually implemented. In light of the disappointing results of the governmental agreement, the national government argued in its 1999 Energy Report that it should designate large-scale locations for wind power (Ministry of Economic Affairs, 1999). Provinces on the other hand called for a new covenant, which would offer them the opportunity to portray themselves as a powerful and goal-oriented tier of government and thus give a strong rationale for their existence[33]. After consulting the provinces, and in line with the Dutch tradition of seeking consensus, the 1991 covenant was renewed in 2001. This second administrative agreement, known as the Governmental Agreement on the National Development of Wind Energy (*Bestuursoverkomst Landelijke Ontwikkeling Windenergie – BLOW*) was signed by six ministries of the national government, all twelve provinces and the Association of Netherlands Municipalities (Vereniging van Nederlandse Gemeenten – VNG). The aim of this covenant is to install 1500 MW onshore capacity by 2010. Each province is again required to designate locations for wind turbines. A central feature of BLOW is that all government parties together should realise these provincial targets taking into account the relative balance of power. Up to now, provinces have performed divergent within the framework of BLOW. They have developed different steering strategies[34] to guide municipalities in wind power implementation and there have also been noticeable differences in terms of enthusiasm (Duyn van, 2005; TNO, 2005). If by the end of 2005 municipalities were not cooperating the provinces formally had the right to designate areas for wind energy in any municipality.

3.7.3 Reducing the complexity of the formal authorisation trajectory

Apart from improving coordination, simplifying procedures has also been an important strategy. In 2002 the State Secretary for Economic Affairs set up an interdepartmental taskforce Bottlenecks for Gas Extraction and Wind Energy. This taskforce was set up within the framework of the national Better Government for Citizens and Companies (*Beter Bestuur voor Burger en Bedrijf)* project, better known as the B-4 project. The aim of this project was to reduce the burden of rules and procedures for the corporate sector and to increase the quality of

the government's performance on behalf of citizens and companies. The taskforce was charged with drawing up an inventory of the formal rules and procedures applicable to wind power projects. The aim of this survey was to come up with proposals for halving the time required for authorisation. Policy proposals based on this inventory were improved coordination of licensing procedures, abolition of the 'actio popularis'[35] and the use of the State Projects Procedure (SPP) for wind power projects above 50 MW. The SPP is characterised by the integration of different public inquiry procedures and possibilities to appeal. Moreover, in the State Projects Procedure the responsibility for the authorisation trajectory is transferred to the national government. Paradoxically, the taskforce also recommended the foundation of a new project office in January 2006 (in cooperation between the Ministry of Economic Affairs, the Ministry of Housing, Spatial Planning and the Environment and the Ministry of Agriculture, Nature and Food Quality). Although the Renewable Energy Project Office was only recently disbanded, the new project office is supposed to perform a fairly similar role in coordinating and stimulating projects in collaboration with regional and local governments. The bureau should offer a solution for the deficiencies in the communication between different competent authorities during the authorisation trajectory (Ministry of Economic Affairs et al., 2004).

3.8 The wind power supply market in figures

It follows from the preceding sections that the Dutch wind power supply market does not comprise a homogenous set of actors. In this section we will describe the development of this market and show that we in fact need to distinguish the four different types of entrepreneurs that were defined in chapter 2. They own the total capacity installed in the Netherlands (figures 3.1 – 3.5). Implementation patterns are described for each entrepreneurial group consisting of four elements: (1) capacity installed; (2) number of turbines installed; (3) number of projects installed; and (4) location of projects installed.

One thing needs to be said about the breakdown into entrepreneurial groups based on ownership. Between 1989 and 2004, 31 projects involving 147.3 MW were realised in joint ownership, which amounted to 12.8% of the total capacity installed during those years. If a project is carried out by a joint venture (JV), the project (or the number of turbines involved) is assigned to a particular entrepreneurial group on the basis of the proportion of ownership. Taking a closer look at developments in the share of capacity realised in joint ownership in the period 1989-2004, we see only a slight increase. In the first half of the 1990s (1989-1995) 11.7% of the total capacity was installed in joint ownership. For the subsequent period 1996-2004, 13.1% of the total capacity that was installed was realised in joint ownership. More projects were carried out with the help of a professional wind power developer or outside expertise. In those cases, some or all of the development of a project is contracted out but ownership remains entirely in the hands of the entrepreneurs involved. In relative terms, new independent wind power producers (40% of total capacity installed by this group until 2002), and to a lesser degree energy distributors (12% of total capacity installed by this group until 2002), have been most inclined to implement wind turbines in joint ownership. By comparison, small private investors only implemented 5.5% of total capacity in joint ownership.

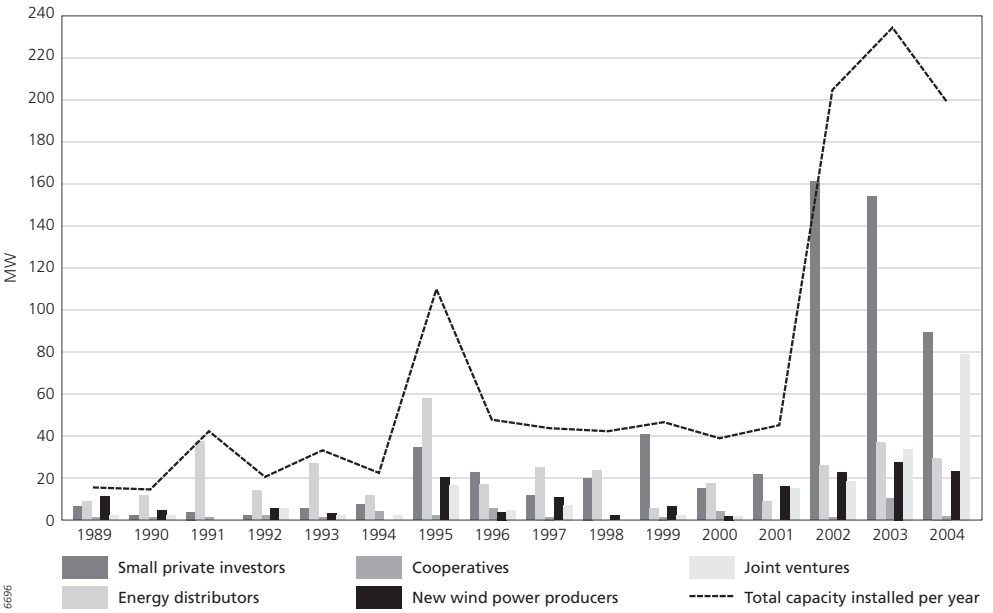


Figure 3.1 Wind turbine capacity installed per year (MW) (Sources: (KEMA, 2002/2003; Wind Service Holland, 2003/2004)).

3.8.1 Capacity installed in the period 1989-2004

Throughout the 1990s the capacity increased on average by more than 30 MW annually. There is one exception: in 1995, 101 MW of capacity was installed. At the start of 1996, the government's financial incentive system switched abruptly from a subsidy to a fiscal system. This changeover marked an important turning point and caused the peak in implementation in 1995. The even growth in capacity ended in 2002. Capacity increased sharply in 2002 and 2003 (166 newly installed turbines and an increase in capacity of 217 MW in 2002 and 183 newly installed turbines and an increase in capacity of 233 MW in 2003). Both peaks were driven by favourable economic circumstances due to the greening of the fiscal system, the liberalisation of the sector and heavy consumer demand. These new institutional circumstances stimulated decentralised private power producers in particular.

3.8.2 Market shares of the four entrepreneurial groups

Energy distributors dominated the wind power supply market at the beginning of the 1990s. Comparing energy distributors and small private investors or farmers on the basis of the number of turbines installed and the number of projects and the total capacity that was installed (figures 3.1 to 3.3) leads to the conclusion that while the contribution of small private investors increased, the role of the electricity sector declined in importance. In terms of the number of projects carried out, small private investors dominated throughout the 1990s. As far as the number of turbines and total capacity installed are concerned, it can be seen that the electricity sector dominated up to the middle of the 1990s. The number of turbines installed by small private investors exceeded the number of turbines installed by the electricity sector for the first time in

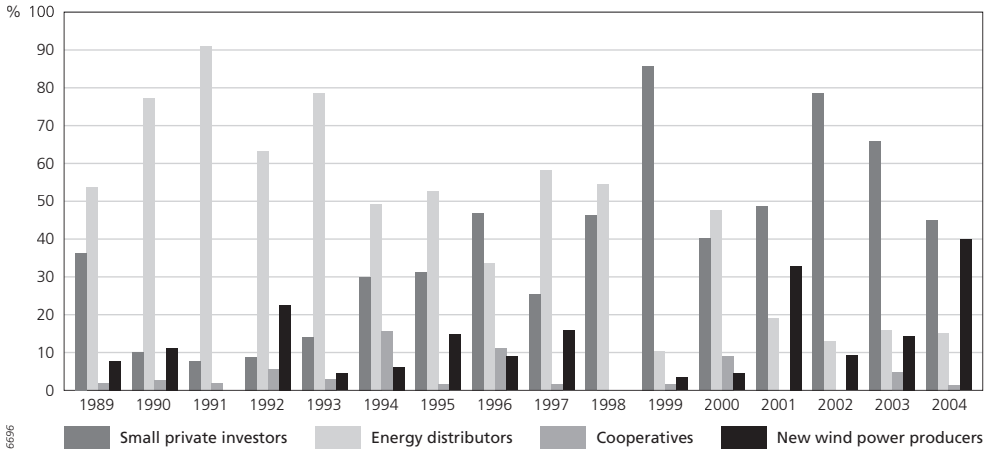


Figure 3.2 Contribution to wind turbine capacity installed per year (%) (Sources: (KEMA, 2002/2003; Wind Service Holland, 2003/2004).

1994. In 1996, the same applied to total capacity installed. By the end of the 1990s small private investors dominated the market on all three measures: in the number of turbines, the number of projects and total capacity installed annually. Over the last few years, small private investors have caught up with – and in 2002 even surpassed – the electricity sector in terms of total capacity installed over the whole period.

The other two categories of entrepreneurs studied (wind cooperatives and new independent power producers) were of minor importance during the final decade of the twentieth century as the statistics on the number of turbines, projects and capacity show (figures 3.1, 3.2 and 3.3). The market share of cooperatives exceeded 10% in only two years, 1994 and 1996. The annual market share of new independent producers in the period from 1989 to 2000 fluctuated between 0% in 1991 and a maximum of 23% in 1992 and was 8% on average. However, over the last four years (2001-2004) the market share of new independent wind power producers has risen to 21.8% on average. The market shares of energy distributors and small private investors in these four years were 14.7% and 62.3% respectively. Bearing in mind that almost 60% of total capacity in the Netherlands was installed in the period from 2001 to 2004, the conclusion is justified that the relative importance of new independent wind power producers has increased considerably during the last few years and even surpassed that of energy distributors.

3.8.3 Differences in regional developments

It goes without saying that technological developments lead to a constant expansion of areas suitable for wind energy exploitation. Nevertheless, implementation of wind turbines capacity was concentrated mainly in seven so-called wind abundant provinces[36]. At the beginning of the 1990s, the geographical distribution of total capacity installed was fairly evenly divided over these seven provinces. Over the years, however, a geographical shift has taken place and the distribution has become more uneven. There is a correlation between the relative contribution to total capacity installed by the four entrepreneurial groups and this geographical shift in

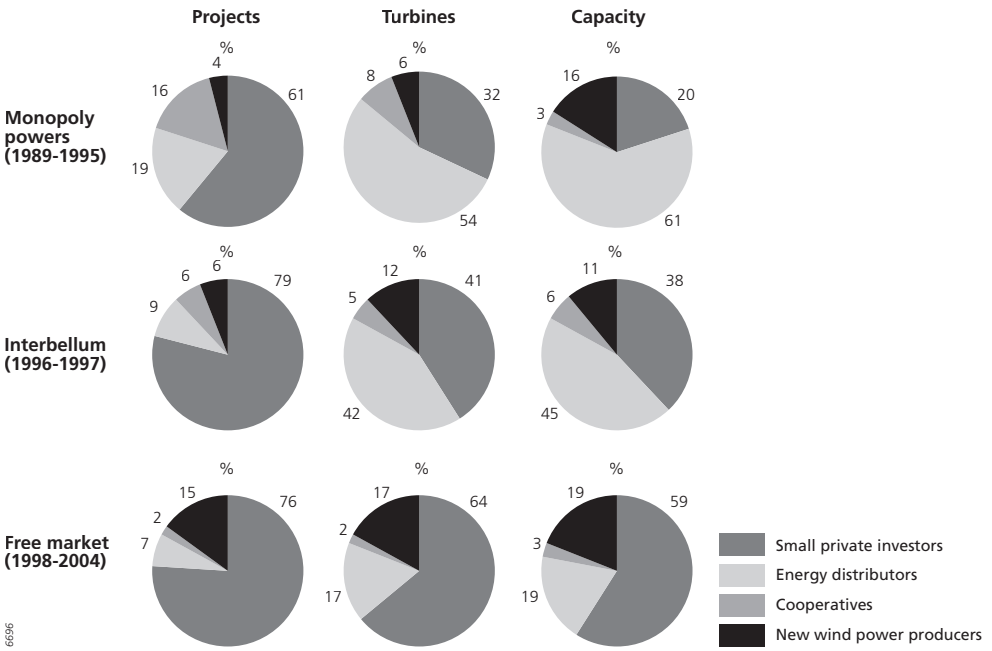


Figure 3.3 Contribution to number of projects, turbines and capacity installed by different entrepreneurial groups during three successive periods[38] (Sources: (KEMA, 2002/2003; Wind Service Holland, 2003/2004))

investments. Whereas the northern provinces of Groningen and Friesland led the way in terms of capacity installed at the beginning of the 1990s, Flevoland[37], Noord-Holland and Zuid-Holland have led in recent years. In addition, whereas energy distributors were the main type of investor in Groningen at the beginning of the 1990s, small private investors are the main type of investor in Flevoland and Noord-Holland nowadays. A relatively large and heterogeneous group of independent wind power producers emerged at the end of the 1990s. In the years 2001 and 2004 this entrepreneurial group surpassed energy distributors in terms of capacity installed. Since 1998, more than 85% of capacity installed by this entrepreneurial group has been installed in just three provinces, Flevoland (39%), Zuid-Holland (29%) and Noord-Holland (18%), theoretically implying an increase in competition for good wind sites in these provinces.

3.9 Three market periods

From the developments described in this chapter we can distinguish three successive market periods for wind power supply. This division is based on changes in institutional conditions, on changes in relationships between the main categories of actors and on the patterns of implementation by the main categories of wind power entrepreneurs.

3.9.1 Monopoly powers (1989-1995)

The first period started with the implementation of the Electricity Act in 1989, which separated electricity production from electricity supply and consumption. This was a major turnabout in the vertically integrated monopolistic electricity supply sector of those days. It was the very beginning of competition with energy distributors entering into decentralised generation.

A lengthy tradition of interrelatedness between the Ministry of Economic Affairs and the traditionally state-owned electricity sector determined policy developments in this period. Policies on renewables consisted of voluntary agreements, in which a central role was assigned to the energy distributors, which were regarded as the main implementers of large-scale wind technology. The financial incentive system focused on the electricity supply side: it mainly consisted of investment subsidies. There was no green electricity market. Energy distributors dominated in terms of the number of turbines and total capacity installed annually in this period.

3.9.2 Interbellum (1996-1997)

The second period started with the publication of the third White Paper on Energy in 1996, which outlined the essential elements of future Dutch electricity policy: liberalisation of the electricity sector and promotion of a sustainable energy supply. The years 1996 and 1997 were intermediate years devoted to laying the groundwork for the new liberalised market. The focus of the financial incentive system changed. Stimulation of supply was no longer considered feasible under free market conditions. Accordingly, the financial incentive system switched from a subsidy to a fiscal system and demand-side measures such as voluntary pricing schemes. During these intermediate years small private investors overtook the electricity sector with regard to the number of turbines and total capacity installed annually.

3.9.3 Free market (1998-2004)

The third period started with the passing of the Electricity Act in 1998, which created the framework for the liberalisation of the market. The liberalisation of the market improved the bargaining position of private power producers, who were no longer obliged to sell their electricity to the regional energy distributor. In July 2001 the green electricity market was the first segment of the retail market that was fully opened to competition. Simultaneously, due to the greening of the tax system suppliers were able to offer green electricity for the same price or even more cheaply than electricity from fossil fuel sources. The economic conditions for wind power had never been as favourable in the Netherlands. New suppliers entered the market and started to treat consumers as customers with freedom of choice. A drastic increase in demand for green electricity occurred. Small private investors started to dominate the wind power supply market in terms of the number of turbines, the number of projects and total capacity installed annually. The relative importance of new independent wind power producers also increased and even surpassed that of energy distributors.

To show the correlation between social and institutional conditions and the performance of the four different groups of entrepreneurs we need to discuss the implications of the changes in institutional conditions and the changes in relationships between the main categories of actors for the implementation patterns shown by the four entrepreneurial groups. We will first do this for energy distributors in chapter 4.

Notes

1 Parts of this chapter are taken from an article published in Energy Policy © 2004 (Agterbosch, Vermeulen & Glasbergen, 2004).

2 EZH, EPON, UNA and EPZ

3 (http://www.nma-dte.nl/27-08-2002).

4 Between 1989 and 1997, SAR varied between 3.2 and 3.8 ct/kWh. In 1989, the average cost difference between generation costs of wind power and the SAR remuneration by energy distributors was €7.2 ct/kWh, implying that total generation costs for wind power were about €10-11 ct/kWh.

5 The Minister of Housing, Spatial Planning and the Environment, the Minister of Economic Affairs, the Minister of Agriculture, Nature Conservation and Fisheries and the Minister of Transport, Public Works and Water Management.

6 Six years later, the 1997 Distribution Companies Act would provide a legal basis for charging the MAP levy.

7 The electricity sector (both producers and distributors) determined the electricity tariffs; the influence of the Ministry of Economic Affairs was limited (Köper 2003: 43).

8 This group is one of the 160 sector organisations in the largest Dutch employers' organisation FME (Reiche 2002: 187).

9 The number of Dutch wind turbine manufacturers declined from 12 in 1986 to three in 1991 and only one in 2000.

10 Information exchange on renewable energy (on the design and construction of wind turbines) was a primary activity in the initial years of this hobbyistic anti-nuclear power association.

11 The Association of Wind Turbine Owners in North Holland (VWNH – *Vereniging van Windturbine eigenaren in Noord Holland*), the Association of Wind Turbine Owners in Groningen (VWG – *Vereniging van Windturbine eigenaren in Groningen*), the Association of Wind Turbine Owners in Friesland (VWF – *Vereniging van Windturbine eigenaren in Friesland*), the Association of Wind Turbine Owners IJsselmeerpolders (VWIJ – *Vereniging van Windturbine eigenaren IJsselmeerpolders*), and the Association of Wind Energy Utilisation (WEB – *Wind Energie Benutting, Friesland*).

12 A German electricity company E.ON acquired EZH. A Belgium company Electrabel acquired EPON. Reliant (USA) acquired UNA. In turn, energy distributor Nuon (Unit Nuon Power Generation) acquired the power plants of Reliant in 2004. With this takeover Nuon created a vertically integrated power company, active in large-scale electricity generation, distribution and supply to end-users. However, the Netherlands Competition Authority (*Nederlandse Mededingings autoriteit – NMa*) demanded the auction of 900 MW of production capacity (Energeia, 2005, http://www.energeia.nl/dossier.php?DossierID=6&ID=21246).

13 (http://www.energie.nl/15-09-2005).

14 According to the 1998 Electricity Act, privatisation of distribution companies is subject to ministerial approval. A couple of small distribution companies were sold to German utilities, and since then there has been a political debate on the conditions under which privatisation can take place. In 2001, a draft Act on Privatisation of Energy Distribution Companies was drawn up to regulate conditions for privatisation. Before this act could be discussed in parliament a German company acquired another energy distributor. After the 2002 elections, the new minister withdrew the privatisation act, announcing that he would not allow any further privatisation until the market was fully liberalised (Damme van 2005: 12).

15 The Office of Energy Regulation (DTe) has been included as a chamber within the Netherlands Competition Authority (NMa). NMa and DTe have set up a joint monitoring system ('Market Surveillance Committee'). This committee follows the developments on the electricity market in the Netherlands.

16 The 1998 Electricity Act gives the Minister of Economic Affairs the possibility to enforce quota obligations on consumers that can be implemented by means of Green Certificates trading (Dinica, 2001: 46).

17 Producers of green electricity, both domestic and imported green electricity received green certificates for each MWh of electricity produced. These certificates could be traded between market participants. Energy distributors and other retailers that supply electricity to end-users could buy the certificates from renewable energy producers, such as wind power entrepreneurs. If an energy distributor (or other retailer) supplied a green consumer with a certain amount of green electricity and the distributor had bought the same amount of green certificates, then the tax authorities reimbursed the REB for this consumer (Van Damme, Zwart, 2003: 395).

18 The Green Label system replaced the MAP levy and was introduced to accelerate the process of reaching the 3% renewable energy target for distributors in 2000 (MAP 2000) and to share the financial burden caused by this target (Dinica, 2003: 447-448).

19 Moreover, the generic feed-in tariff of 2 €ct/kWh known as the REB energy tax Article 360 would be abolished.

20 Windunie is a cooperative established in 2001 that represents the owners of approximately 300 MW of wind power, mainly small private investors.

21 Requiring land ownership, spatial planning, securing permits, carrying out environmental studies, purchase of the turbines and contracting for grid connection.

22 (1) Exemption from the Municipal Land Use Plan, (2) Assignment of the Construction Permit and (3) Registration within the framework of the Environmental Management Act.

23 More than 70% of environmental requirements are nowadays based on European legislation which has a direct effect on spatial planning in the Netherlands (Van Ravesteijn and Evers, 2004).

24 Registration according the Provisions and Installations Environmental Management Decree (PIEMD).

25 This ministry is now officially called the Ministry of Agriculture, Nature and Food Quality.

26 The basic structure for implementing protected areas according to the directives was the 'Ecological Main Structure in the National Structure Plan for the Rural Areas' *Structuurschema Groene Ruimte* (NSPRA). However, the NSPRA is not a legally binding plan, which implies that it is unsuitable for translating the directives into national legislation. In May 1998, the European Court condemned the Netherlands for this failure. From that moment spatial developments could be tested for compliance directly against the directives.

27 Backes, Ch. (Professor of (European) environmental law), Personal communication, 24 March 2004.

28 The LWF replaced the Bird Protection Act 1936, the Endangered Exotic Animal Species Act 1995, Hunting and Shooting Act 1954, Useful Animal Species Act 1924 and the Nature Conservation Act, chapter V (species conservation component).

29 LASER – an executive office of the Ministry of Agriculture, Nature, and Fisheries (Since 2003 known as the Ministry of Agriculture, Nature and Food Quality).

30 GRFW is a foundation with approximately 160 donors and seven board members (Nauta, H. 2005 (member of the board of GRWF), personal communication, 8 December 2004). The principal aim of GRWF is to prevent the installation of wind turbines in the province of Friesland.

31 Stichting Windhoek is a foundation with approximately 165 sympathisers. The principal aim of Stichting Windhoek is to prevent the installation of wind turbines in the province of Groningen.

32 An inventory of suitable locations, based on a computer simulation, was translated into a target for each province. Together these targets amounted to 1000 MW of wind power capacity in 2000 (Novem, 1991: 7-8 in Van Duyn, 2005: 35-36).

33 At the time the rationale for the existence of the provincial administrative level was under discussion.

34 An enquiry into the effectiveness of different strategies showed that administrative and public support for wind power declined in those provinces using a top-down steering approach. Based on this enquiry, a more interactive type of steering was recommended (Duyn van 2005).

35 In Dutch planning and environmental permitting procedures, access to official procedural stages was open for all. This 'actio popularis' is abolished in July 2005. As of that moment, one should show a direct interest to be granted access in the procedures.

36 In 1991, the Governmental Agreement on Planning Problems Wind Energy was agreed between the Ministry of Economic Affairs, the Ministry of Housing, Spatial Planning and the Environment and seven coastal wind abundant provinces (Groningen, Friesland, Flevoland, Noord-Holland, Zuid-Holland, Zeeland, and Noord-Brabant).

37 Flevoland even accounts for 48% of total national wind energy, thus dominating by far.

38 The three successive market periods are explained in section 3.9.

4 Energy distributors

4.1 Introduction[1]

This first chapter on entrepreneurial groups deals with the performance of energy distributors. At the beginning of the 1990s, energy distributors possessed a leading position in wind power generation in the areas where they had a monopoly of supply. They aimed for the implementation of large-scale projects that consisted of a large number of turbines and they preferred to implement these projects in 100% ownership. Over the last decade, the position of energy distributors on the wind power supply market changed; it became more inferior. This chapter explains this development, the emergence and performance of energy distributors, and relates them to the implications of changing social and institutional conditions.

4.2 Market performance

The performance of distributors in terms of capacity realised in the different Dutch provinces over the last 15 years can be described on the basis of the following features:

1. a shift from a dominant to a subordinate position in wind power generation,
2. large-scale applications and long lead times,
3. a strong concentration in ownership of wind power capacity,
4. a shift in market shares among energy distributors and a geographical shift in investments,
5. heterogeneity among distributors with regard to the joint ownership strategy.

The first feature, the shift from a dominant to a more inferior market position, has already been described in chapter 3 (figure 3.2): the contribution to total capacity installed by energy distributors decreased from 61% in the first market period to 19% in the third market period. Note that the dominant position in wind power generation at the beginning of the 1990s went

Table 4.1 Project characteristics of projects realised by energy distributors

Size of project	1989-1995		1996-1997		1998-2004	
	Number	%	Number	%	Number	%
Solitary	29	43.3	2	15.4	6	21.4
2 or 3 turbines	5	7.5	3	23.1	3	10.7
4 or 5 turbines	9	13.4	2	15.4	6	21.4
6 to10 turbines	12	17.9	2	15.4	9	32.1
11 and above	12	17.9	4	30.8	4	14.3
Average number of turbines per project	7.6		7.0		4.8	
Average capacity per project (MW)	2.4		3.1		5.4	

together with a more inferior role with regard to the number of wind power projects that was installed.

The second feature of the performance of this group is the preference for large-scale applications, combined with the long lead times that characterise these large-scale projects. The average size of the projects realised by energy distributors declined over the years; at least in terms of the average number of turbines installed per project. Simultaneously, the average project size in terms of the average capacity installed increased (table 4.1).

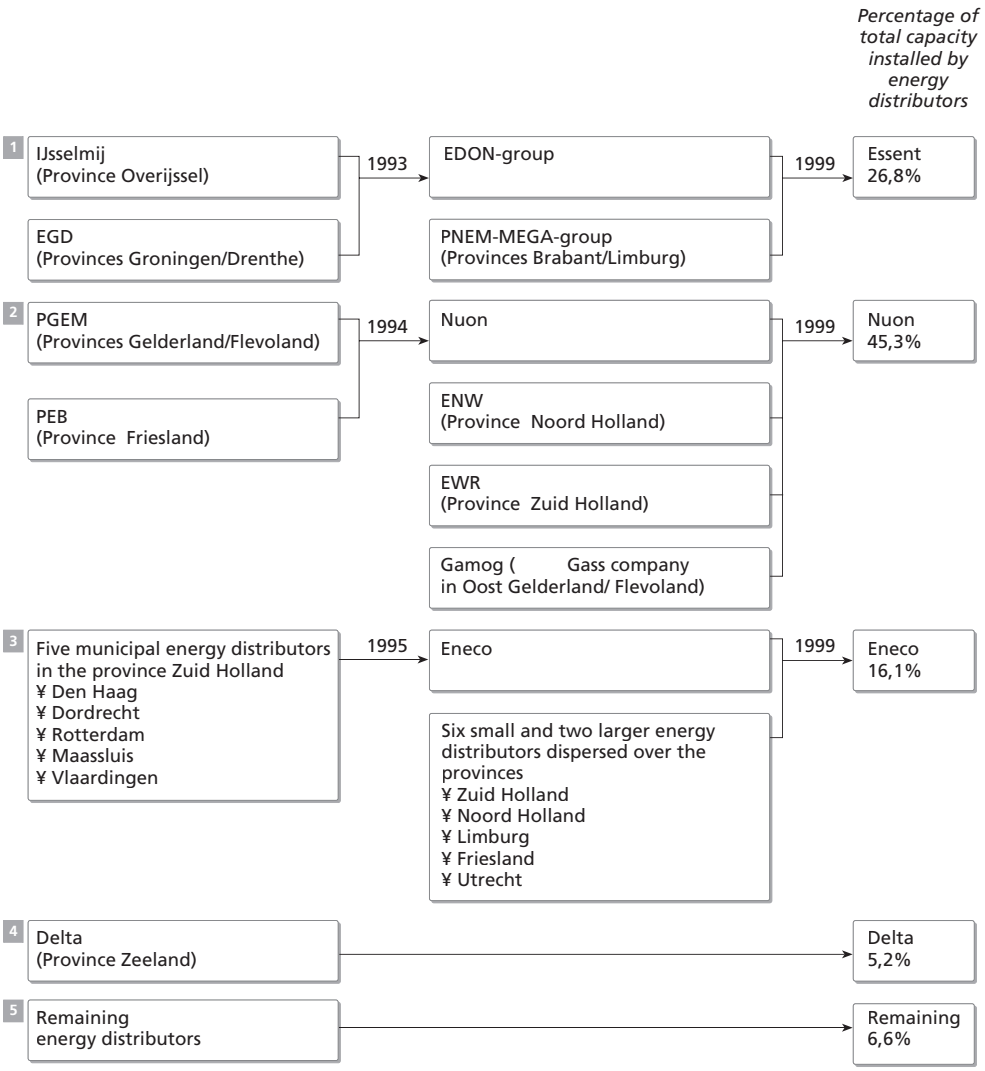


Figure 4.1 The origin of the energy distributors that own the wind power capacity installed by this entrepreneurial group.

The increase in the average capacity installed is a direct consequence of technological progress. The individual turbine has become larger and thus the average capacity per project. In the last 20 years turbines have increased in power by a factor 100. Both the nacelle height and the rotor diameter were in the order of 40 m at the beginning of the 1990s. For modern wind turbines they are in the order of 100 to 150 m (Slootweg, 2003: 6). The high average number of turbines per project at the beginning of the 1990s can be explained by the installation of some very large wind power projects by this entrepreneurial group, which forced the average upwards[2]. The implementation trajectories of these large-scale wind power projects were characterised by lead times of an average of more than 6 years (Gipe, 1995; Johnson & Jacobsson, 2002; Kamp, 2002).

The third feature is the concentration in ownership of wind power capacity within this entrepreneurial group. This concentration is a direct result of the waves of concentration in energy supply in the 1990s, which left 87% of the retail market to three distributors only (Kaal, 2001). Currently, four out of 20 energy distributors, among them the three largest, own more than 90% of the wind power capacity ever installed by this type of wind power entrepreneur. These four energy distributors are Nuon, Essent, Delta and Eneco. They originated from two merging rounds: one at the beginning and one at the end of the 1990s (figure 4.1).

The fourth feature is the shift in market shares among energy distributors and the related geographical shift in investments (figures 4.2 and 4.3).

Two energy distributors realised a 51% share of total capacity installed by this entrepreneurial group up to 1995: the PNEM/MEGA group (distributor in the provinces of Brabant and of Limburg) and the EDON group (distributor in the province of Groningen)[3]. Although there were other distributors developing wind power projects in this period, they followed at distance when compared to PNEM/MEGA and EDON (figure 4.2).

Over the last decade positions changed and the energy distributor Nuon became market leader. Nuon realised a 66.2% market share of total capacity installed by energy distributors since 1995[4]. The PNEM/MEGA group and the EDON group have been of minor significance in this latter period. In 1999, they merged into a new company Essent. Essent owns 6.5% of total capacity installed by energy distributors since 1995 (26.6% of total capacity ever installed by this entrepreneurial group) (figures 4.1 and 4.3).

With the investments in wind power largely overlapping the original monopoly of supply areas of energy distributors, a geographical shift has taken place in investments. Up to 1995, capacity installed was reasonably even divided over the provinces with abundant wind resources[5]. The province of Groningen (EDON group) was front-runner with a 30% share of capacity installed by distributors. As of 1995, capacity installed by distributors has become more concentrated geographically. The province of Flevoland (Nuon) is frontrunner with a 34% share of capacity installed by this entrepreneurial group.

The final feature is the heterogeneity among energy distributors with regard to the joint ownership strategy. Only Nuon and Delta adopted the joint ownership strategy[8]. Almost 25% of the capacity installed by Nuon and more than 60% of the capacity installed by Delta has been realised in joint ownership with other types of entrepreneurs (see appendix 4.1).

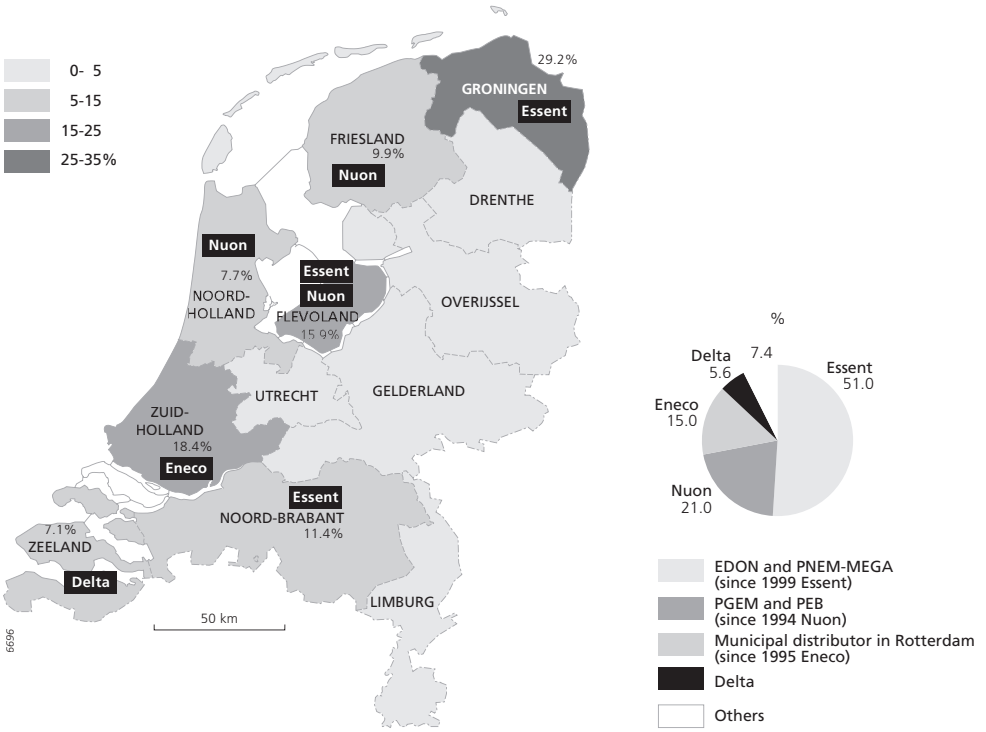


Figure 4.2 Share per province and per energy distributor of total capacity installed by this entrepreneurial group (1989-1995) (KEMA, 2002/2003; Wind Service Holland, 2003/2004)[6]

In total 54 MW or 15% of total capacity realised by energy distributors has been realised in joint ownership with other types of entrepreneurs. More projects have been realised with help of independent project developers or consultants in the field of wind power. In those cases (parts of) the development of a project is contracted out. Ownership, however, maintains fully in the hands of the energy distributor. The joint ownership strategy was a marginal phenomenon until 1998. As of that year the relative importance of this strategy increased, due to some large projects realised by Nuon in joint ownership with farmers. In the period 1989-1995, 6.2% of total capacity installed by energy distributors was installed in joint ownership. In 1996 and 1997, this share was 4.9% and since 1998, this share has increased up to 28.2 %.

Looking at these five features and comparing them with the market performance of small private investors (see chapter 5) a difference can be noticed in the average project scale and lead-times. The average project scale of projects installed by energy distributors at the beginning of the 1990s is much larger than the average project scale of projects installed by small private investors in those years[9]. Although the magnitude of this difference declined, the projects of energy distributors remained large compared to projects realised by small private investors. Also the average period required for the authorisation of the large-scale projects realised by energy

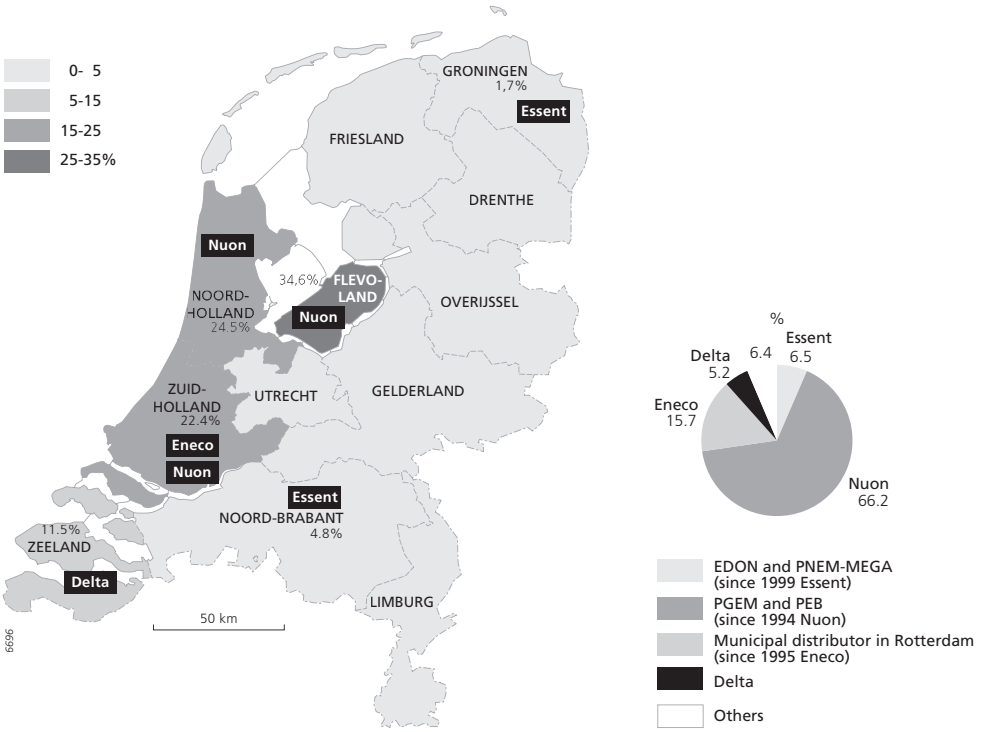


Figure 4.3 Share per province and per energy distributor of total capacity installed by this entrepreneurial group (1996-2004) (KEMA, 2002/2003; Wind Service Holland, 2003/2004)[7]

distributor is long compared to the average period of 1 to 2 years required for the authorisation of solitary installations by small private investors.

To explain these features, the next section focuses on the effect of social and institutional conditions in the operational process of implementing a large-scale wind power project by energy distributors. The authorisation trajectory of a typical project for energy distributors is analysed. A national perspective follows this local perspective: the effect of changing social and institutional conditions is analysed in each of the three market periods *Monopoly power (1989-1995)*, *Interbellum (1996-1997)* and *Free market (1998-2004)*. Finally, section 4.7 concludes with a reflection on the main findings.

4.3 An inside look into a typical project for energy distributors

This section uses the results from an analysis of a concrete wind power project in the municipality of Zeewolde in the province of Flevoland[10]. The municipality of Zeewolde hosts a large-scale wind power project, owned by the regional energy distributor. It is a representative project because of its scale and its lead-time. The project comprises 19 turbines, which is in accordance

with the preference of energy distributors for large-scale applications. The planning and securing of the project started in 1989 and it became operational in 1998.

The project is also representative for the first market period. The project fits with the focus of central and provincial authorities on large-scale wind power applications and the tendency to cooperate with regional energy distributors at the beginning of the 1990s. This focus was visible in several Dutch provinces. Energy distributors were conceived to be the actor who should realise the provincial wind power targets set in the Governmental Agreement on Planning Problems Wind Energy (*Bestuursovereenkomst Plaatsingsproblematiek Windenergie*) (BPW). Also in the province of Flevoland authorities focused on the regional energy distributors for realising the provincial target.

4.3.1 The initiative

At the end of the 1980s, the regional energy distributor approached the municipality to discuss the opportunities for large-scale wind power exploitation within the parish boundaries. The municipal authorities were principally in favour of wind energy and the Eemmeerdijk was designated. The Eemmeerdijk is situated on the municipal border, which separates municipal land from the Eemmeer lake. The Eemmeerdijk is part of the Royal Domains and land ownership was under direct management of the District Water Board (*Waterschap*). This District Water Board enabled the energy distributor to conclude a contract for the use of the land. These positive attitudes towards the large-scale Eemmeerdijk wind power project by local and regional authorities were important pre-conditions for the distributor to request for the revision of the municipal land use plan in 1990. In the Dutch legislative system it is not advisable to apply for permits if the municipal land use plan does not indicate areas for wind turbines and there exist no legal instruments to force municipal authorities to cooperate in adjusting the MLUP. Consequently, the influence of local politics is large.

Profitable exploitation of the project turned out to be possible thanks to the assignment of national subsidies that together counted for 40% of the total investment costs (Zeewolde, 1994: supplement 1; Council of State, 1996: 4). The Ministry of Economic Affairs (*Economische Zaken*) (EZ) and the Ministry of Housing, Spatial Planning and the Environment (*Volkshuisvesting, Ruimtelijke Ordening en Milieu*) (VROM)[11] granted the subsidies, which was a clear sign of national governmental support. It seemed a perfect start for the formal authorisation trajectory.

4.3.2 The authorisation trajectory

Formally, the period required for authorisation is 18 months to 2 years, excluding the time required for informal pre-deliberations and the terms required for appeal. Including the terms for appeal prolongs the formal period to more than 5 years[12]. In this case, it took the energy distributor 10 years to implement the project. Figure 4.4 shows that the authorisation trajectory consists of four different lines of decision making. This section discusses these lines of decision making, i.e. the problems and solutions that arose during the revision of the Municipal Land Use Plan (MLUP), the assignment of the Nature Conservation Permit (NCP) and the assignment of the Environmental Permit (EP)[13].

Formal objections have been raised at 7 different moments divided over 3 different procedures by 12 different stakeholders on local, regional and national level (see table 4.2). These objections

considerably prolonged the total time required for authorisation[14]. Note that the Council of State cancelled the EP in June 2000, more than 1.5 years after the turbines were built. Ever since, the project operates illegally in formal legal terms.

Most of the administrative and public opponents used arguments concerning inconsistency of policy or incorrect implementation of legal norms. They shared for instance the opinion that

Table 4.2 Stakeholders making protest against the Eemmeerdijk wind power project.

Level	Administrative authorities	Civic associations
National	Ministry of Economic Affairs (EA)	
	Regional department of the National Spatial Planning Agency*	
	Regional department for Agriculture, Nature and Outdoor Recreation**	
	Regional department of the Ministry of Agriculture, Nature, and Fisheries	
Regional	Provincial executive	Provincial Environmental Federation***
	District Water Control Board Fleverwaard	
Local	Municipality Eemnes	VBE-farmer/residents association
	Municipality Blaricum	Individuals
	Municipality Bunschoten	

* Regional department of the Ministry of Housing, Spatial, Planning, and Environment (VROM)
** Regional department of the Ministry of Agriculture, Nature, and Fisheries (ANF).
*** This organisation spoke on behalf of the Vogelbescherming Nederland – 'Birdlife International'.

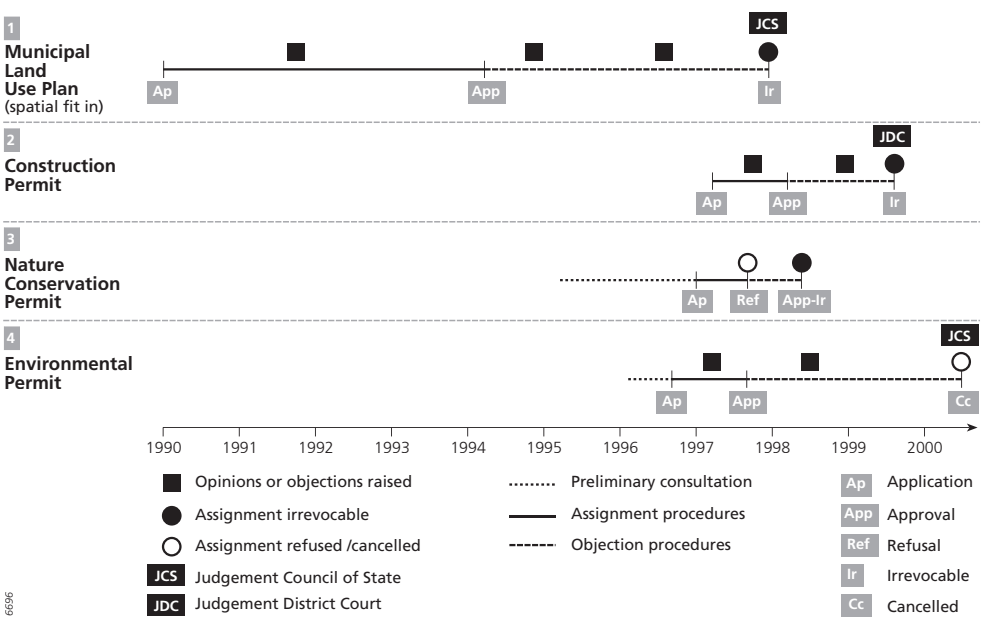


Figure 4.4 Formal authorisation trajectory of the Eemmeerdijk project.

the revision of the Municipal Land Use Plan was in direct conflict with the Regional Land Use Plan and with the National Structure Plan for Rural Areas[15], and they all expressed the opinion that the energy distributor should have performed an Environmental Impact Assessment[16]. Besides these arguments with respect to the management of procedures, arguments were raised with respect to specific interests. A municipality located nearby raised the argument that the project interfered with the 'historical atmosphere' of their fishing-village and the Provincial Environmental Association raised arguments related to the protection of water birds. Local public resistance had its origin in a limited number of active opponents all living nearby the project. These opponents used a wide array of arguments, such as increased risks for workers and cattle in the direct neighbourhood of the turbines, noise and shadow hindrance, landscape pollution and devaluation of neighbouring property.

Revision of the Municipal Land Use Plan

Initial support on both local and national governmental level implicated an increase in the implementation capacity for the regional energy distributor and was an important precondition for the distributor to request for the revision of the land use plan. During the revision process, however, this increase in implementation capacity was nullified by the emergence of administrative- and public resistance, which were caused by inconsistency in planning and a top-down planning approach.

Inconsistency in planning on provincial and municipal level[17] turned out to be food for objection for several administrative stakeholders on different levels of authority. Among the opponents were (regional departments of) the ministries that simultaneously supported the project through granting subsidies, which is a sign of internal fragmentation or dispersed decision making powers and interests within both ministries.

In addition, the exclusive top-down decision making strategy that the distributor and the municipality employed turned out to be counter productive. Municipal deliberation about the planning and licensing of the project was restricted to the energy distributor and a limited number of authorities (authorities that possessed decision making powers within the formal framework of procedures). Residents were not actively involved, which strengthened the opinion that the local authorities passed over the interests of the local community. Residents felt that the project solely served external private interests by trampling on the local common interests. Local farmers who established a residents association with the aim to prevent the implementation of the project used every opportunity to make protest. Final decision making went by recourse to the court. Herewith, the point of departure for licensing was not entirely positive. The revision of the Municipal Land Use Plan (MLUP) took more than 7 years (figure 4.4). The formal period required for authorisation and appeal at the litigation section of the Council of State is about 112 weeks, implicating a tripling of the maximum formal period.

Assignment of the Nature Conservation Permit

The assignment of the Nature Conservation Permit (NCP) illustrates the influence of EU legislation and the lack of coordination of decision making in different procedures (revision of the MLUP and the assignment of the NCP). Intertwined procedures characterised by dispersed decision making powers are difficult to manage. The consequence in the Eemmeerdijk case was inconsistency of policy at ministerial level, which lowered the implementation capacity for the investor.

The number of stakeholders involved in the licensing procedure was limited compared to the number of stakeholders that had been involved in the revision of the local land use plan. The difficulties that arose during the procedure were not so much related to the complexity of the social network but more to the inability of the Ministry of Agriculture, Nature and Fisheries (ANF) to manage the permitting process. With the informal assurance that the project did not need a Nature Conservation Permit, ministerial policy praxis was diametrically opposed to the Dutch formal legal framework[18]. Moreover, this ministerial policy praxis was no longer feasible after the assignment of the Eemmeer lake as special protection zone according to the EU-Birds Directive in 1995. The permit became required after all, which illustrates the influence of EU policy on national level conduct of legislation and therewith on the implementation capacity at project level.

The distributor applied for the permit and the Ministry assured that the assignment would not become a problem. This assurance became untenable however when objections raised against the permit by an environmental association turned out to be identical to objections raised by the Ministry of ANF against the revision of the land use plan. These latter objections were awaiting final judgment at the Council of State. With these latter objections, the Ministry indirectly subscribed to the objections raised by the environmental association. Consequently, the Ministry decided to refuse the permit. This decision evoked strong indignation both from the side of the distributor and the municipal authorities: *'We had clear agreements about the Nature Conservation Permit, and we even had them in writing…and then a refusal!'* [19]

Some months later, the Council of State declared the objections against the revision of the land use plan unfounded, which created a paradoxical and problematic administrative situation. Now, the refusal of the permit was not only at odds with informal assurances, but also with the judgment of the Council of State on the revision of the land use plan.

The permit was refused, but the distributor disputed the validity of this decision. The Ministry, who felt uncomfortable with the situation, was receptive to renewed consultation. This consultation rather quickly led to a compromise: the permit became allocated on the condition that measures would be taken to prevent bird collisions.

The formal time required for authorisation is 3 to 9 months. In this case, the assignment of the Nature Conservation Permit took about 1 year. The authorisation trajectory was prolonged with approximately 2 years, due to the time required for informal (pre-) deliberation (figure 4.4).

Assignment of the Environmental Permit

The first deliberation between the energy distributor and the municipality about the Environmental Permit (EP) dates from august 1996. The municipality decided to allocate the permit in October 1997. This decision was cancelled by a final judgment of the Council of State in June 2000. The municipal department on environmental issues had been incapable of delivering a permit of sufficient quality. The municipality department (the management of the procedure depended on one civil servant only) depended most on knowledge, expertise and suggestions delivered by the energy distributor. Attempts to obtain independent expertise on technical issues such as noise regulation brought about nothing[20]. Frequent and personal contact between the distributor and the municipal department steered the decision making process. The department and local politicians were favourably disposed towards the project and deemed an overstepping of the legal reference level for noise acceptable. This local political decision was grounded on the ALARA-principle[21].

The residents association and a municipality located nearby objected to the assignment of the permit. They used the argument of incorrect implementation of noise regulation. This argument turned out to be the basis for annulment of the permit by the Council of State. At the moment of annulment, the wind power project was already operative for a period of two years. Since June 2000, illegally in formal legal terms. The formal period required for authorisation and appeal at the litigation section of the Council of State is about 78 weeks, implicating more than a doubling of the maximum formal period in this case (figure 4.4).

4.3.3 Social and institutional conditions in the operational process of implementation

Figure 4.5 provides an overview of the regional and local social and institutional conditions as constituent elements of the implementation capacity for energy distributors. Looking at this figure, we observe many local level institutional and social conditions impeding the implementation capacity for energy distributors.

The quality of planning and licensing is under pressure due to the complex legal framework that consists of different procedures with different competent authorities. Dispersed decision making powers, fragmentation of interests between and within authorities and a limited knowledge base or administrative capacity bring about a lack in intergovernmental coordination; inconsistent administrative behaviour and incorrect implementation of legal norms (see figure 4.5, arrows 1 and 2). The formal legal framework is difficult to manage.

Each of the procedures offers the opportunity to make protest and administrative and public stakeholders use these opportunities. A wide array of arguments is used to oppose to a project, among them arguments concerning inconsistency in policy or incorrect implementation of legal norms (see figure 4.5, arrow 3). Projects can be highly delayed by these arguments. Consequently, the authorisation trajectory needs to be executed highly conscientiously, which is in view of the complex legal framework and the limited scope and structure of knowledge not an easy job to perform. Long lead times are the ultimate result.

The course of the authorisation trajectory is insecure because of a lack in institutional stability and a policy practice that deviates from the formal legal framework. Long lead-times implicate that institutional conditions change in the course of the authorisation trajectory due to policymaking processes at different government levels. Changing legislation increases insecurity about the course of the procedures. Insecurity also results from the freedom of choice left by the formal legal framework and incorrect implementation of procedures and norms. The formal legal framework is only one of the regulating mechanisms that steer decisions. Interests and informal contacts are other regulating mechanisms, which contribute to a policy praxis that deviates from formal institutional conditions. In the project analysed, administrative resistance could have been avoided if planning on municipal and provincial level had been in line with one another (see figure 4.5, arrow 4).

Energy distributors used a strategy of frequent and informal contact with the competent authorities to increase administrative commitment and to reduce insecurity about the course of procedures. The project analysed illustrates the importance of this strategy. Many problems occurred during the planning and permitting of this project. Most of these problems were solved by way of informal deliberation between the distributor and the competent authority (see figure 4.5, arrow 5a). Simultaneously, this top down decision making strategy brought about a loss of

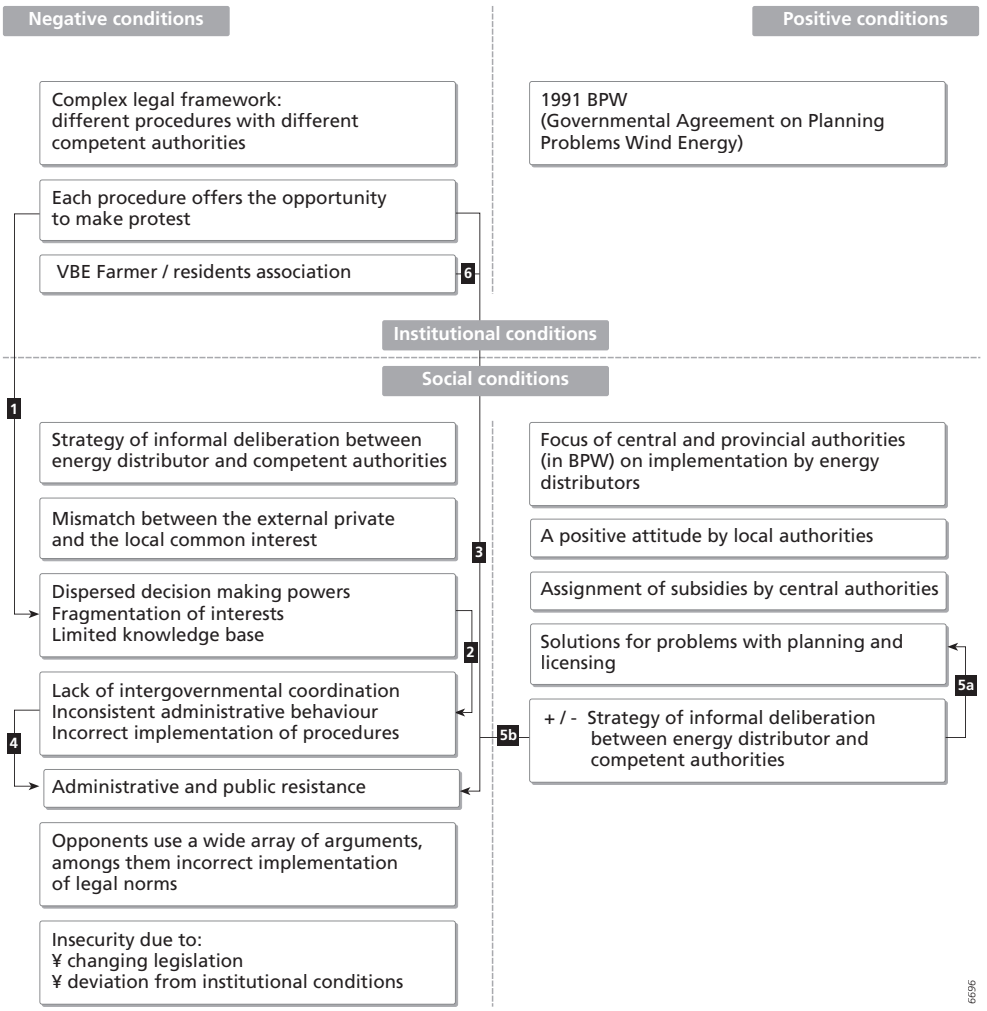


Figure 4.5 Constituent local social and institutional conditions of the IC for energy distributors

supports from other (local) interests. It caused a situation wherein final decision making took place by the judiciary. The strategy was counter productive (see figure 4.5 arrow 5b).

The mismatch between the local common interest and the external private or global environmental interest contributes to the risk of local social resistance. In the project analysed, residents were not actively involved in planning and licensing. This strengthened their opinion that the municipal authorities passed over the interests of the local community. Residents felt that the project solely served external economic interests by trampling on the local common interests. The absence of local issues in planning and licensing contributed to fierce resistance from a limited number of active opponents who together raised a residents association to prevent implementation (see figure 4.5, arrow 6).

This inside look into a typical project for energy distributors provides an explanation for the long lead times that characterised the large-scale projects. It is not clear however to what extent these problems at the operational level of implementation can explain the shift in market position of this entrepreneurial group. Energy distributors possessed a leading position in wind power generation, but lost this position in recent years. Analysis of the entrepreneurial group as a whole and competing groups are required to explain this shift. Therefore, the next sections apply a national perspective. The effect of social and institutional conditions, such as changing legislation, changing financial incentive schemes and strategies chosen by energy distributors in each of the three market periods is analysed.

4.4 Monopoly powers (1989-1995)

Generation costs for wind power were still too high at the beginning of the 1990s, and due to its intermittent character wind power was not expected to be an alternative to conventional, centrally produced electricity. The motivation of energy distributors to invest in wind power was limited for that reason. Nevertheless, the national level social and institutional conditions created a small niche market for wind electricity generation by this entrepreneurial group.

The 1989 Electricity Act allowed energy distributors to exploit their own small-scale production capacity up to a maximum of 25 MW. Although energy distributors mainly focused at establishing joint ventures with industries to exploit decentralised cogeneration plants above 25 MW, they at the same time used this option for small scale (wind) power generation to fulfil their CO_2 targets set in the first National Environmental Policy Plan (NEPP) in 1989. In keeping with the Electricity Act and the first NEPP, energy distributors decided to voluntarily adopt the Environmental Action Plan (*Milieu Action Plan- MAP*) for the energy sector. MAP fitted into the collaborative approach of policy making through voluntary agreements that characterised energy policy developments in the first half of the 1990s (see figure 4.6, arrow 1). The 3% renewable energy target set out in the MAP created an incentive for energy distributors to invest in renewables, such as wind energy. By issuing an environmental MAP levy on consumer tariffs, energy distributors were able to support the generation of renewables. The MAP levy fitted well into the strategy of energy distributors. It allowed them to comply with their CO_2 reduction targets in a less expensive and risk-free manner. It also allowed them to become more independent of conventional electricity generators and to improve their environmental image.

Energy distributors themselves as well as both private and industrial energy generators could apply for subsidies from the MAP levy. How the MAP subsidies would be distributed and the actual conditions for the payback tariffs (see chapter 3 section 3.3.2 on Standard Arrangements for Redeliveries -SAR in the Electricity Act) had to be agreed on a case-by-case basis by the regional energy distributor and a potential renewable energy generator. These self-regulatory institutional conditions created a strong bargaining position for energy distributors, and left little room for private wind power entrepreneurs (see figure 4.6, arrow 2).

As part of MAP, eight energy distributors agreed on 'Windplan': a cooperative scheme with the aim of installing 250 MW of wind power in 1995 (see figure 4.6, arrow 4). Windplan was in line with the preference of the central authority – the Ministry of Economic Affairs – that electricity

companies should be the main implementers of wind technology. The Ministry of Economic Affairs granted an investment subsidy to Windplan, provided that it would purchase a large number of the turbines from Dutch manufacturers. Windplan was abandoned in 1993. Several reasons can be distinguished for this breakdown (see figure 4.6, arrow 3).

First, energy distributors started to believe that, on their own; they could purchase turbines more cheaply abroad. Second, energy distributors made very high and unusual technical demands on turbines, which Dutch manufacturers could not easily satisfy (Gipe, 1995; Kamp, 2002). A third reason is connected to the fact that the core business of the electricity sector was -and still is – retailing both fossil- and non-fossil-fuel electricity in a large-scale and centralized manner. The energy distributors who cooperated in Windplan preferred large-scale wind power applications. Although these projects consisted of a large number of turbines, they were in terms of capacity rather small: the installation of 250 MW of wind power required the installation of numerous wind power projects. Energy distributors were inexperienced in the planning of such decentralised facilities. They often used a top down planning approach ignoring public and political discussion on the local government level[22]. These discussions concern local aspects such as the scenic value of the landscape and beliefs about interference such as noise, shadow flicker and the impact on birds. Ignoring these local level interests created conflicts at the level of local politics (Wolsink, 1996). Problems with planning and permitting caused lead times of an average of more than six years. The motivation to invest in wind power waned for that reason.

A fourth reason was that energy distributors came from the electricity sector. This sector was never in favour of decentralised production and concerns like diversification of energy sources and reducing environmental degradation were traditionally of minor significance. This lengthy tradition of structural beliefs was an important impeding social condition. In general, wind power was not perceived to be a technical and economic attractive investment with future potential. Most energy distributors were committed to wind power only because of the 3% renewable energy target set out in the MAP. An employee from one of the energy distributor expresses: *'Wind power was a sideline. The only reasons to be occupied with wind power implementation were the MAP reserves and governmental pressure. From a broader economic perspective, it was not considered to be interesting at all'* [23] and '*Wind energy activities and investments had its origin in the accidental enthusiasm of some employees with sufficient high positions. It was not a serious topic for the board of directors'* [24]. The boards of directors were occupied with the wave in concentration in energy supply. Organisations changed and became bigger. The original distributors that had agreed upon Windplan disappeared. Wind energy was not a high priority in this turbulent period.

The implementation peak of 1995 was a one-time event (figure 3.1), caused by the sudden changeover from a subsidy to a fiscal incentive system at the start of 1996. The situation was such that although central authorities were awarding subsidies, local authorities were not yet awarding construction permits, which was a clear inconsistency in government policy on different levels. All projects realised after 31 December 1995 were no longer eligible to submit claims to the subsidy scheme. *'There existed a reservoir of projects that were awarded subsidies, but not the required permits. For investors it was all or nothing'* [25]. The threat of losing the subsidies (combined with ignorance of and uncertainty about the new fiscal arrangements) led energy distributors to force their projects through. This was an interesting phenomenon. It seemed that the threat of changing institutional and subsequently economic conditions enabled energy distributors to break through other impeding conditions like planning problems and lengthy permit

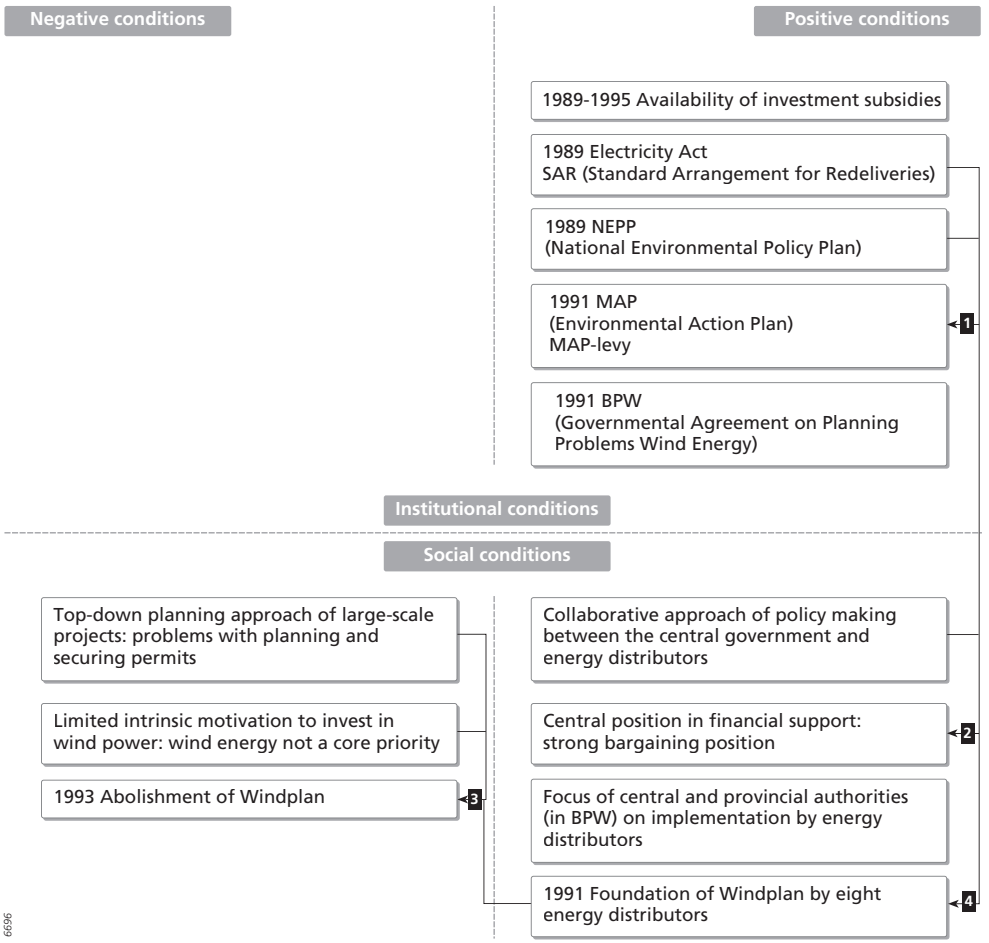


Figure 4.6 Constituent conditions of the implementation capacity for energy distributors in the Monopoly powers (1989-1995)

procedures. They have successfully used the argument of inconsistent policy (which would cause their projects to die an early death) as a means of increasing pressure on local permit-issuing authorities. Installed capacity of the electricity sector peaked, resulting in a temporary increase in the implementation capacity for this type of entrepreneur in that year.

Looking at figure 4.6 we observe that many national social and institutional conditions, such as the collaborative approach of policy making through voluntary agreements between the central government and energy distributors and the strategic energy policies as a logical result, contributed to the implementation capacity for energy distributors at the beginning of the 1990s. A positive correlation can be seen between national level institutional conditions (the 1989 Electricity Act, NEPP and MAP), national level social conditions (the special power position in

financial support and the foundation of Windplan) and the performance of this entrepreneurial group on the market. At the same time, the problems they encountered in securing sites and permits additionally reinforced the already limited intrinsic motivation of this entrepreneurial group to invest in wind power and negatively affected the implementation capacity. Nevertheless, whether they wanted to or not, energy distributors dominated the market in terms of the number of turbines and total capacity installed at the beginning of the 1990s. In terms of projects, however, this was not the case (see figure 3.4).

4.5 Interbellum (1996-1997)

The start of 1996 has been an important turning point. The emphasis on subsidies shifted with the greening of the fiscal system (Vermeend & van der Vaart, 1998). Economic conditions for energy distributors to invest in wind energy strongly deteriorated during the first two years following this shift. This, combined with severe planning problems and a weak green demand by customers, implied a weakening of the implementation capacity for this type of wind power entrepreneur. Some energy distributors adopted an innovative strategy by offering green electricity products for voluntary purchase. Besides this voluntary instrument, a second voluntary instrument was developed in consultation with the central government: the tradable Green Label system. This system was developed to reach the renewable electricity target for energy distributors set in the new voluntary agreement MAP-2000. Both instruments, the green electricity schemes and the Green Label system, were supported by the central government and strengthened the already central position of energy distributors in financial support for renewable electricity.

The switch in government financial incentive system marked a new era accompanied by uncertainty and unfamiliarity. One major shortcoming was the fact that energy distributors could not make use of the new fiscal arrangements[26]. To compensate for the expected loss of available subsidies, to additionally stimulate renewable electricity and to anticipate on the future liberalised and more demand-oriented sector, PNEM (later Essent) thought of the possibility to offer its captive consumers green electricity for an additional price. A pilot project in the municipality Tilburg started at the beginning of 1995 and shortly after this pilot PNEM decided to offer green electricity to all of its customers. PNEM collaborated in this innovative strategy of treating consumers as customers with a freedom of choice with the environmental organisation WWF. WWF supervised the activities; it monitored whether the green sales balanced the green purchases and production. By the end of 1995, two other energy distributors started similar activities[27]. A correlation can be noticed between the adoption of these green electricity schemes and wind power market shares: these three 'first moving energy distributors' had a 72% market share of total wind power capacity realised by energy distributors at the time.

Though the number of customers that participated in the green electricity schemes was initially limited[28], many distributors followed the example of these first moving distributors. In 1996, three distributors sold 'Groene stroom' (Green Electricity), four distributors sold 'Eco stroom' (Eco electricity) and one sold 'Natuurstroom' (Nature electricity)[29]. For most of these companies WWF supervised the activities (Dinica & Arentsen, 2001).

The voluntary green electricity schemes were completely in line with the preference of the Ministry of Economic Affairs that considered a shift to market-compatible policies and instruments unavoidable (see figure 4.7, arrow 1). To stimulate the schemes, the sale of green electricity was exempted from the maximum legal tariff for captive consumers. Simultaneously, as a price-cutting instrument, customers buying green electricity were exempted from paying the MAP levy and from 1998; they were also exempted from paying the REB tax[30]. The funds collected through the green electricity schemes were predominantly directed towards investments in wind power[31]. Comparable to the MAP levy, energy distributors decided on the distribution of these funds, which strengthened their central position in financial support (see figure 4.7, arrow 2).

The green electricity schemes offered the possibility to compensate for the weakening of the implementation capacity due to the shift from a subsidy to a fiscal system. This compensation remained limited because of a disappointing green demand. In consultation with the central government, energy distributors started a campaign to bring green electricity to the attention of a broader public at end of 1997. The Ministry of Economic Affairs co-financed this campaign.

The second new instrument, developed in this period, was the tradable Green Label system (figure 4.7, arrow 3). This system was a direct result of a new voluntary agreement with the Minister of Economic Affairs within the framework of MAP in 1997. One of the spearheads of this MAP-2000 was the promotion of renewable electricity. Energy distributors committed themselves to a 3,2% renewable electricity target of total electricity sales in 2000. This integral renewable electricity target was translated into separate targets for wind energy, electricity from biomass and hydropower by a special committee under the auspices of the utilities' umbrella association EnergieNed[32]: 60% of the target should be realised by wind energy. The targets were adopted on the condition that a tradable green certificate system would be developed to provide for a balanced division of costs. This Green Label system was developed by EnergieNed and was launched in January 1998. It was managed by the energy distributors and provided for practicing with producing and selling green electricity in a competitive setting.

Both instruments, the voluntary green electricity schemes and the Green Label system, offered several advantages for energy distributors. The instruments enabled the financing of renewable electricity projects and decreased the dependence on changes in the financial incentive system: they improved the situation for wind power investments by energy distributors. Both instruments furthermore allowed for training in marketing a commodity in a competitive setting and contributed to an environmentally friendly image. The instruments were developed in consultation with or supported by the Ministry of Economic Affairs and fitted into the main lines of policy making as expressed in the third white paper on energy (1995): liberalisation of the sector and promotion of a sustainable energy supply.

The interrelatedness between the Ministry of Economic Affairs and distributors was also visible in the problem analysis that the government employed: securing sites and permits for wind power projects were identified as main problems for the wind power market development. This analysis correlates with the problems encountered by distributors, the actor that according to the central authorities should be the main implementer of wind turbines. Reducing political and administrative bottlenecks by streamlining planning and permitting procedures was mentioned

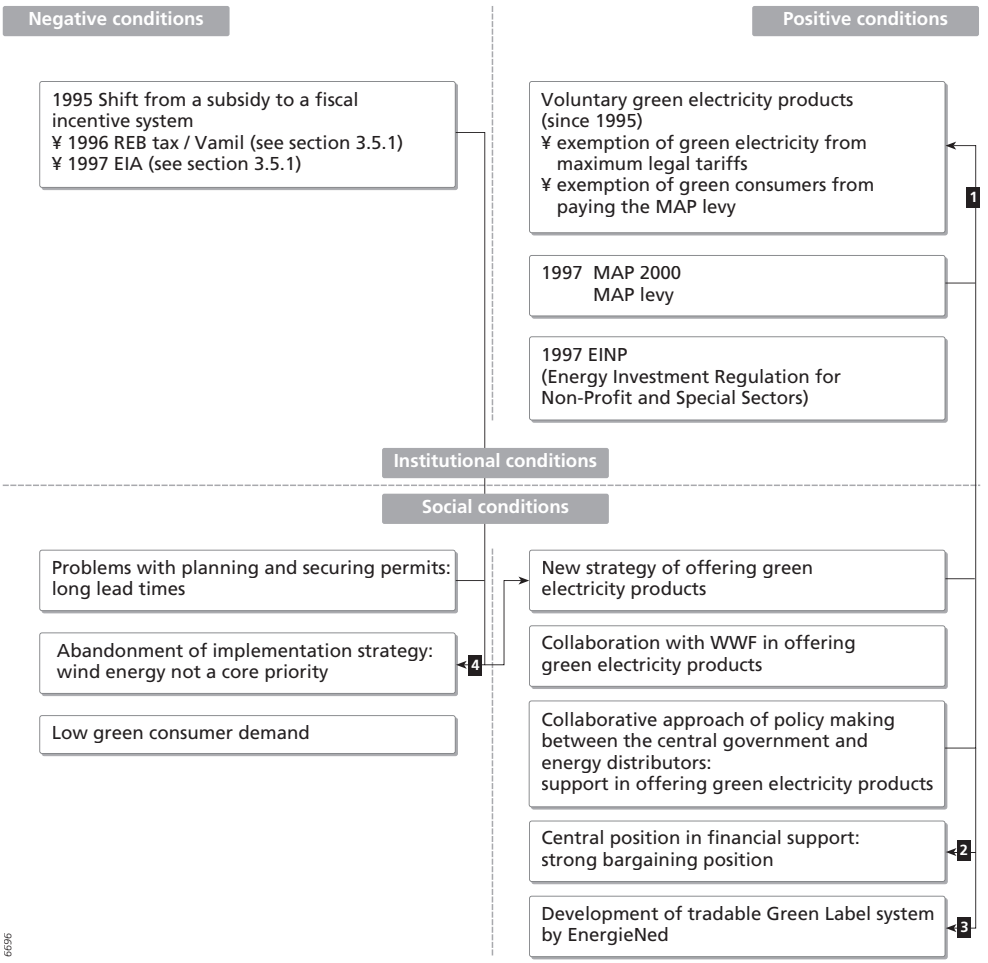


Figure 4.7 Constituent conditions of the implementation capacity for energy distributors in the Interbellum (1996-1997)

as an important aspect of wind power policy in the third Dutch white paper on energy (1995) and the Action Program for Renewable Energy (early 1997)[33].

Looking at figure 4.7 we still observe predominantly positive social and institutional conditions in this period: the monopoly position of the former period remained. The negative effect of the shift in financial incentive system, combined with the negative experiences with the planning and securing of projects, led to a change in focus at the side of energy distributors (see figure 4.7, arrow 4). Whereas in the beginning of the 1990s energy distributors adopted a wind power implementation scheme (Windplan), they in 1996 and 1997 partly left this implementation strategy. They adopted a new strategy of marketing green electricity and producing and selling it in a competitive setting. By adapting their strategy to the new demands set by the

future liberalised setting, they strengthened their influence in financial support. The success of marketing green electricity depended on the availability of a green consumer demand triggering investments and on possibilities to actually implement projects. Green consumer demand remained low however and implementation laborious. In line with the shift in focus from implementation to trading, energy distributors changed places with small private investors and farmers with regard to the number of turbines and capacity installed annually.

4.6 Free market (1998-2004)

The major institutional changes that determined implementation capacity developments in the third period were (1) the liberalisation of the wholesale electricity market in 1998, (2) the greening of the fiscal system, (3) the liberalisation of the green consumer market in 2001 and (4) the demand for clustering turbines. Strategies chosen by distributors differed in this period.

The first important change was the liberalisation of the wholesale electricity market, which started in 1998. Just like in most member states of the European Union, the regional monopolistic electricity sector in the Netherlands had to make way for the coming liberalised free market. Energy distributors began to make the transition to private companies[34] without regional constraints. They were no longer obliged to buy electricity from decentralised private (wind) power producers, and the other way around, these decentralised producers no longer had to sell their electricity to the local energy distributor -from now on decentralised producers were permitted to sell their electricity to the highest bidder. At the end of 1997, PNEM was the first energy distributor that entered into an agreement with a private wind power producer outside its monopoly of supply area. PNEM was willing to pay a better price than the regional energy distributor: it was a first signal of increased competition.

The greening of the fiscal system was a second important institutional change. Since 1998 renewable electricity and physical imported renewable electricity have been exempted from the Regulated Energy Tax (*Regulerende Energie Belasting – REB tax*). Due to an increase in the amount of tax from 2.6 to 7.1 eurocents per kWh over the period 1999-2001, electricity companies were able to offer green electricity at the same or at even lower prices than those for electricity from fossil fuel sources (Junginger et al., 2004). Such favourable economic conditions for wind energy had never before been realised in the Netherlands, and they were comparable to economic conditions in Germany at that time.

As a result of the REB tax, and additionally stimulated by the third major institutional change in this period, the liberalisation of the green electricity market in 2001, energy distributors decided to intensify their strategy of marketing green electricity (see figure 4.8, arrow 1). They changed their policy from 'just' meeting their targets for a share of green electricity in the total electricity supply, to actually attracting customers on a large scale by using advertising campaigns and television commercials[35]. There was a lot at stake for these companies – consumers spend about 19 billion Dutch guilders (about 8.6 billion euros) on electricity each year. By January 2003, about 1.4 million customers had switched to green electricity (the Netherlands has about 7 million households) (GreenPrices, 2002/2003). In terms of our conceptual model, changing institutional

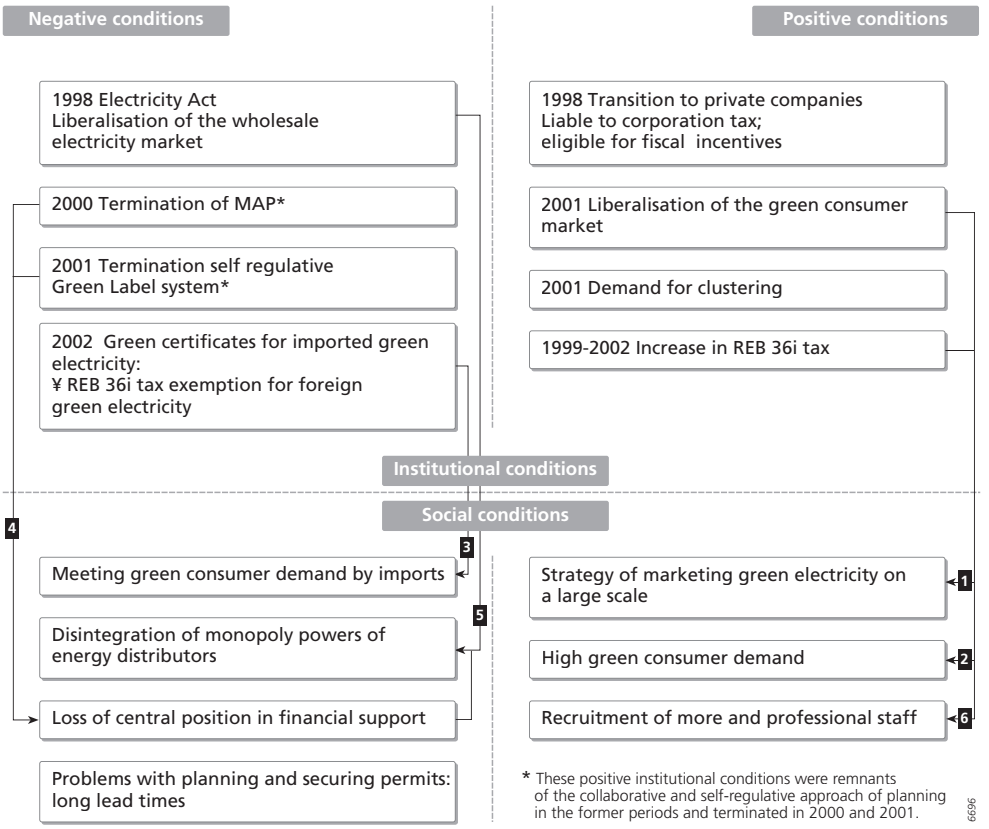


Figure 4.8 Constituent conditions of the IC for energy distributors in the Free Market (1998-2002)

conditions (REB tax exemptions and liberalisation of the green consumer market) led to adaptive behaviour by energy distributors, which resulted in a large consumer market for green electricity and enlarged the implementation capacity for wind power entrepreneurs in general (see figure 4.8, arrow 2).

At the beginning of this millennium, attracting green customers was not the problem in the Netherlands. However, supplying them with renewable electricity was. Energy distributors did not have enough domestic renewable electricity in stock. Therefore, pressure on energy distributors to increase both installation of new domestic capacity and imports of green electricity rose tremendously since the green electricity market was opened up. In chapter 3 we explained that imported green electricity became eligible for green certificates (and therewith for the REB tax exemption) after a lobby by energy distributors. The argument used by the energy distributors was that a shortage of domestic green electricity would frustrate the emerging green electricity market. The actual result however was that energy distributors used the revenues of the REB tax exemption[36] mainly for the import of foreign green electricity, which was easier and

cheaper to obtain than green electricity from domestic, newly installed wind power plants. This was a paradoxical situation, in which favourable institutional conditions for domestic wind power implementation (enlarging the implementation capacity for domestic wind power entrepreneurs) were partly cancelled out by the availability of cheap imports (see figure 4.8, arrow 3).

At the moment of the third institutional change, the liberalisation of the green consumer market in 2001, a green certificate system managed by the government came into effect. This system replaced the self-regulative and voluntary Green Label system managed by the energy distributors. A major difference between both systems was that the utilities' umbrella association EnergieNed issued the Green Labels, whereas an independent Green Certificates Body issued the green certificates. The replacement of the Green Label system, combined with the termination of the voluntary MAP agreement in 2000, implicated that energy distributors lost their central position in financial support for wind power (see figure 4.8, arrow 4). Moreover, the liberalisation of the wholesale market additionally disintegrated the monopoly powers of the energy distributors (figure 4.8, arrow 5). The combination of national level institutional conditions (liberalisation of the wholesale market, liberalisation of the green consumer market and introduction of the green certificate system) and national level social conditions (a large consumer demand and a tight green electricity market as a result) caused a shift in existing power relations. The bargaining power of decentralised wind power entrepreneurs increased considerably, at the expense of the bargaining power of energy distributors. The practical result was a relative decline of the implementation capacity for energy distributors. Despite favourable economic (due to the greening of the fiscal system) and technical conditions for Dutch wind power exploitation, importing cheap green foreign electricity seemed to be more in their interest than installing new wind power capacity. In line with these developments, the contribution of energy distributors with regard to the number of projects, number of turbines and total capacity installed decreased (see chapter 3 figures 3.1 to 3.3).

A final institutional change arose from land use policy: the demand for clustering turbines. This demand was inserted in part one (draft document) of the Fifth National Policy Document on Spatial Planning by VROM (Ministry of Housing Spatial Planning and the Environment, 2000b). However, in part three of the document (revised document), the demand for clustering was no longer included (Ministry of Housing Spatial Planning and the Environment, 2000a). In spite of this, most provinces adopted it in their regional land use plans and soon a continued effect could be seen at the local level. The demand for clustering, combined with the fact that wind power exploitation was a profitable investment and the fact that the installation of investment-intensive multi-megawatt wind turbines was technical viable, implicated a context in which an increasing amount of capital was needed to build a modern, multi-megawatt wind farm (investment costs were about 1 million euros per MW in 2002)[37]. Based on these conditions, an increase in the number of large wind power projects funded by energy distributors could be expected. Such an increase failed to occur, due to the national social and institutional conditions mentioned above combined with the procedural and societal problems at the operational level of implementation. It was complicated for energy distributors to construct larger wind power plants in the densely populated Netherlands. One of the complicating factors in larger wind power projects was the participation of more landowners and the involvement of more municipalities. The four energy distributors adopted different strategies. Apart from Delta, which nearly

stopped all its wind power implementation activities, they all recruited more and professional staff specific for wind power project development (see figure 4.8 arrow 6). Nuon and Eneco took over a new independent wind power producer[38]. These two distributors realised almost 82% of all capacity installed by distributors since 1995.

Looking at this period we observe that the possibility of profitable exploitation combined with a large customer demand created a strong incentive to invest in wind power projects. Economic conditions were no longer prohibitive: as the market has grown around the world, production costs for a kilowatt-hour of wind power dropped by some 20% over the period 1997-2002. Due to the tax exemptions of about 7 €ct/kWh in 2000 and 2001, wind electricity could compete well with electricity from fossil fuel sources (Junginger et al., 2004). These tax exemptions and the liberalisation of the green consumer market in 2001, stimulated energy distributors to intensify the strategy of marketing green electricity. The result was a large consumer market and a reinforcement of the IC for wind power entrepreneurs in general. Next to this general effect, the demand for clustering specifically contributed to the IC for large, wealthy investors like energy distributors. Despite these positive conditions, a decrease occurred in the contribution of energy distributors with regard to the number of projects, number of turbines and total capacity installed. This decrease can be explained by other national level institutional changes, such as the REB tax exemption for foreign green electricity and the liberalisation of the wholesale electricity market. The liberalisation of the wholesale market caused the disintegration of monopoly powers of energy distributors and the REB tax exemption for foreign green electricity favoured import. These conditions hampered the IC for energy distributors.

4.7 Reflection on the main findings

The chapter started with describing the performance of energy distributors over the last 15 years on the basis of the following features: (1) a shift from a dominant to a subordinate position on the market, (2) a focus on large scale applications and relatively long lead times, (3) a strong concentration in ownership of wind power capacity, (4) a shift in market shares among energy distributors and a geographical shift in investments and (5) heterogeneity with regard to the joint ownership strategy. In the analyses that followed we especially focused on explaining those features that characterise the performance of this entrepreneurial group as a whole. These features were related to changing social and institutional conditions.

The focus of central and provincial authorities on large scale applications and the tendency to cooperate with energy distributors contributed to the implementation capacity for energy distributors at the beginning of the 1990s and to a rise in large-scale wind power initiatives. These large-scale initiatives fitted with the core business of this entrepreneurial group, which was and still is retailing electricity in a large scale and centralised manner. Fulfilment of these conditions was essential to start authorisation trajectories, but was insufficient for rapid implementation. The planning and licensing of these large-scale projects additionally required a positive attitude by local administrative authorities.

The inside look into a typical project for energy distributors provided an explanation for the long lead times that characterise their projects. This feature can be explained by a variety of institutional regulatory and social problems at the local level, in which the importance of social conditions prevails. The formal legal framework that governs the planning and permitting of these projects is a dynamic constellation of interdependent institutional that offers chances and bottlenecks for project realisation. The authorisation trajectory is not a blueprint of the formal institutional regulatory framework. Policy freedom provided by this framework, dispersed decision making powers, fragmentation of interests within and between administrative and public stakeholders, and a limited knowledge base contribute to a policy practise that deviates from the formal regulatory framework. These social conditions increase insecurity about the course of the procedures. To reduce this insecurity, energy distributors use a strategy of frequent and informal contact with the competent authorities. Simultaneously, this strategy of informal and closed top-down decision making runs the risk of loosing support from other (local) interests and increases the change of social resistance. Local residents are inclined to oppose to a project when they feel that decision making serves the external economic interests or the global environmental interests by ignoring local aspects such as hindrance and risks for citizens, the scenic value of the landscape and nature protection. These local residents are able to delay a project considerably. Consequently, distributors need time, expertise and capital to bear the required pre-investment costs associated with the planning of wind power projects.

The additional analysis of the entrepreneurial group as a whole provided an explanation for the changing performance of this entrepreneurial group during the subsequent market periods.

The first period is characterised by a collaborative approach of policy making between the Ministry of Economic Affairs and energy distributors, which brought about national strategic energy policies that contributed to the implementation capacity for this entrepreneurial group. These national social and institutional conditions created a momentum for wind power implementation by energy distributors, which reacted on this impulse by agreeing upon a wind power implementation scheme. This scheme failed however due to planning problems at the operational level of realizing wind power projects. Wind energy was not a core priority for energy distributors and when they met with considerable adversity in securing sites and licenses, they abandoned the implementation scheme. National institutional conditions that weakened the implementation capacity of energy distributors were non-existent in the first period. Weakening of the implementation capacity resulted solely from priorities and strategies adopted by the distributors themselves, and this weakening was strongly related to the problems they encountered in securing sites and permits.

The collaborative approach of policy making between the Ministry of Economic Affairs and energy distributors that characterised the first market period continued in the second period. Again national social and institutional conditions contributed to the implementation capacity for energy distributors, and again social conditions that brought about a weakening of the implementation capacity were sector induced. Energy distributors changed focus from a wind power implementation strategy to a strategy of marketing green electricity and producing and selling it in a more competitive setting, which was in line with strategic energy policy developments in the second period. The problems with securing sites and licenses that energy distributors encountered, were identified as main problems for wind power market development

in several strategic energy memorials. Policy instruments to solve these problems were to be developed.

Looking at the third period as shown in figure 4.8 and comparing this period with the first and second period as shown in the figures 4.6 and 4.7 we observe an increase in negative institutional and social conditions. The liberalisation of the sector put an end to the collaborative approach of policy making with strategic energy policies that favoured energy distributors as a logical result. It disintegrated the monopoly power of energy distributors. Moreover, national social and institutional conditions that contributed to the implementation capacity for energy distributors enlarged the implementation capacity for wind power entrepreneurs in general. The result was a decrease in implementation capacity for energy distributors in comparison to the implementation capacity for private wind power entrepreneurs.

The analyses illustrate the complementary character of national and local social and institutional conditions. Positive national conditions at the beginning of the 1990s were hampered for instance by institutional regulatory and social problems at the local level. These problems brought about a change in strategy from implementation to marketing green electricity. This latter strategy is typical for energy distributors, who are the only type of wind power entrepreneur both able to produce and sell wind electricity.

Indirectly and to a lesser degree attention is paid to those features that refer to heterogeneity within this entrepreneurial group. The concentration of wind power capacity in the coastal provinces at the beginning of the 1990s can be explained by the Governmental Agreement on Planning Problems Wind Energy that was agreed on between the Ministry of Economic Affairs, the Ministry of Housing, Spatial Planning and the Environment and seven coastal wind abundant provinces. The shift in market shares among energy distributors and the geographical shift in investments can be explained by regional and local level regulatory and social developments and differences in strategies chosen by individual distributors. The next chapter elaborates more on these regional differences (see chapter 5 section 5.4). It will underline the importance of processes of local capacity building, stressing the importance of regional and local social and institutional conditions for developments in implementation capacity.

Notes

1 Parts of this chapter are taken from an article published in Energy Policy © 2004 (Agterbosch, Vermeulen & Glasbergen, 2004).

2 A project implemented in 1991 in the municipality Noordoostpolder (Flevoland) consisted of 50 turbines and a total capacity of 15 MW (realised by EDON -later Essent).
A project implemented in 1991 in the municipality Lelystad (Flevoland) consisting of 35 turbines and a total capacity of 10,5 MW (realised by PGEM -later Nuon).
A project implemented in 1993 in the harbour of Eemsmond (Groningen) consisting of 40 turbines and a total capacity of 10 MW (realised by EDON -later Essent).
A project implemented in 1995 in the harbour of Eemsmond (Groningen) consisting of 94 turbines and a total capacity of 34 MW (realised by EDON -later Essent).

3 EDON was leader with the establishment of 210 wind turbines and 61 MW.

4 Nuon realised 17 projects, 157 turbines and 125,8 MW mainly in the provinces Noord Holland and Flevoland. One project is located outside these provinces: a project in the harbour of Rotterdam in the province Zuid Holland (13,5 MW operational in 2003).

5 In 1991, the Governmental Agreement on Planning Problems Wind Energy was agreed on between the Ministry of Economic Affairs, the ministry of Housing, Spatial Planning and the Environment and seven coastal wind abundant provinces. Distributors were conceived to be the actor who should realise the provincial targets (Chapter 3, section 3.7.2).

6 The capacity installed in the Groningen is strongly concentrated in a limited number of industrial areas.

7 The capacity installed in Zuid Holland and Groningen is strongly concentrated in a limited number of industrial areas. Eneco established almost all projects realised by energy distributors in Zuid Holland. All these projects are located in one industrial area only: the harbour of Rotterdam. Nuon realised 1 project in the harbour of Rotterdam in 2003.

8 At the beginning of the 1990s, EDON started a project 'Windmills for the Environment' (*Molens voor Milieu*). Debenture capital was raised from private persons with the aim to install wind turbines on public land. The project was not a success from the perspective of participation. Just a limited amount of private capital was raised and a large amount of MAP subsidy was needed to make the turbines economically feasible. 'Windmills for the Environment' is not really an example of joint ownership: the participating private person did not own the turbines realised and they were not given a voice in project realisation.

9 In terms of the number of turbines installed more than 6 times as big and in terms of the capacity that was installed more than 12 times as big.

10 As reported in the document: Agterbosch, S. (2003) 'The operational process of wind power implementation in Zeewolde'. Case study 1: 'Large-scale wind power applications by energy distributors. The importance of social and institutional conditions'

11 The ministry of EZ granted a subsidy within the framework of the Incentive scheme on Energy saving and Renewable energy 1990 (*Steunregeling Energiebesparing en Stromingsenergie 1990*). The ministry of VROM granted the Environmental premium Wind energy (*Milieupremie Windenergie*). This latter scheme was coupled to the incentive scheme of the Ministry of EZ.

12 Peaks to more than 10 years are possible due to policy freedom at the local level. An example is the assignment of the Environmental Permit: the competent authority may decide to prolong the licensing term without limitation (within 8 weeks after application).

13 A discussion of the assignment of the Construction Permit is omitted because in a sense this is a derivative of the revision of the land use plan (see chapter 3, section 3.6.1).

14 Appeal at the District Court took 1.5 years and appeal at the litigation section of the Council of State took 3.5 years. Lead-times were prolonged even more when appeal at the competent authorities is included.

15 The National Structure Plan for Rural Areas (*Structuurschema Groene Ruimte*) is a key planning decision of the Ministry of Agriculture, Nature, and Fisheries (see chapter 3, section 3.6.1).

16 Up to 1999, an EIA was required for all wind power projects comprising more than 20 turbines or in excess of 20 MW. The Eemmeerdijk project comprises 19 turbines.

17 The provincial target of 125 MW of wind power capacity in Flevoland was fully adopted in the Regional Land Use Plan by way of large-scale preferential locations in 1993. The Eemmeerdijk was not one of these preferential locations.

18 Since 1984, jurisprudence on the application of the 1967 Nature Conservation Law provided an obligation to produce a permit for damaging actions within or in the direct neighbourhood of State Nature Reserves (the Eemmeer lake is a State Nature Reserve)

19 Pater, J. (Nuon) Personal communication 25 March 2002; Matthijsse, D.J. (civil servant Zeewolde) Personal communication 17 March 2002

20 The responsible civil servant in Zeewolde consulted on a regular and informal base the municipal civil servant on environmental issues in a municipality located nearby. The civil servant also inquired about legal rules regarding the noise abatement zone 'Eemmeer-lake' at the provincial authorities in Utrecht. Also InfoMil, a governmental information centre for the environment, and the National Bureau Wind Energy were consulted (see chapter 3, section 3.7.1).

21 ALARA is an acronym formed form the phrase 'As Low As Reasonable Achievable' (article 8.11 Environmental Management Act).

22 The investment subsidies that were available at the beginning of the 1990s asked for realisation of the project in the year that the subsidy was granted. This gave an additional impetus to start projects from a short term and top-down perspective (Wolsink, 1996).

23 Dingemans, J. (Eneco) Personal communication 3 March 2005

24 Hutting, H. (independent wind power producer, formerly KEMA employee) Email communication 28 October 2005; Bakema, G. (Essent) Personal communication 1 November 2005.

25 Bosch, G. (Consultant in the field of renewables) Email communication 21 November 2002

26 It took the national government two years to repair this shortcoming. The 'Energy Investment Regulation for Non-Profit and Special Sectors' (the EINP scheme) was introduced in 1997 (Dinica and Arentsen, 2001; Boomsma, 2002; Littel, 2002).

27 Nuon and EDON

28 Participation at company level was initially between 0.3% and 1% of the captive customers (Dinica, 2001: 26).

29 Green Electricity: PNEM, EDON, Delta; Eco stroom: REMU, Eneco, ENW, MEGA-Limburg; Natuurstroom: Nuon.

30 Initially, the government intended to increase the attractiveness of green electricity by lowering the VAT-tariff, however the European Commission refused permission.

31 Wind power producers (both energy distributors and private wind power producers) that received subsidies that were collected through the green electricity schemes were not eligible for the MAP-levy or later on for subsidies from the Green Label system. This rule was called the 'additionally principal': a condition set by the WWF.

32 Bakema, G. (Essent) Personal communication 1 November 2005.

33 Three categories of policy support were advocated: (1) improvement of competitiveness by supporting research and development, (2) stimulating market penetration by greening the fiscal system and by liberalising the renewable electricity market and (3) reducing political and administrative bottlenecks by streamlining planning and permitting procedures.

34 Energy distributors became liable to corporation tax, which enabled them to make use of the fiscal arrangements for wind power investments.

35 In 1999, a campaign organised by the World Wildlife Fund (WFF), the ministry of Economic Affairs, the Project Bureau Renewable Energy and various energy distributors led to a first substantial increase in green consumers. The slogan was 'Don't led the North Pole melt, go for green energy!'

36 The REB tax is divided into two parts: a tax exemption for green energy purchases (Art. 36i of the Environmental Tax Act) and a payment to support green energy producers (Art. 36o)

37 Dingemans, J. (Eneco) Personal communication 3 March 2005; Middelbos, A. (Wind cooperative) Personal communication December 2003, Meerkerk, W. (Independent project developer) Personal communication 19 December 2002

38 In January 2000, Nuon bought WEOM and some of its projects that were in an advanced phase of project development WEOM became a 100% daughter company of Nuon NV. About two years later, ENECO bought GEP and all of its projects that were in an advanced phase of project development. The portfolio of GEP consisted of 20 projects that were in a rather advanced phase of development. For all of these projects, the formal authorisation trajectory could be started.

5 Small private investors

5.1 Introduction[1]

This chapter deals with the performance of small private investors. Wind power exploitation is a supplementary income for this entrepreneurial group, which mainly consists of farmers. In fact, small private investors were the first investors in wind energy in the Netherlands. Until 1988, about 250 turbines (just over 22 MW) were installed, for 68% by this type of entrepreneur[2]. Comparing small private investors and energy distributors on the basis of the total capacity that was installed over the last 15 years, one comes to the conclusion that while energy distributors dominated the market in terms of capacity installed at the beginning of the 1990s, the relative contribution of small private investors increased in the course of the years. From the end of the 1990s, small private investors dominate the market in terms of the number of turbines, the number of projects and total capacity installed annually. This chapter explains the emergence and performance of this group, and relates them to the implications of changing social and institutional conditions.

5.2 Market performance

The performance of small private investors in terms of capacity realised in the different Dutch provinces over the last 15 years can be described on the basis of the following features:

1. a shift from a subordinate to a dominant position on the market,
2. a focus on solitary installations and relatively short lead times,
3. a strong geographical concentration of investments in a limited number of provinces, and a shift in market shares among these provinces,
4. limited employment of the joint ownership strategy.

Table 5.1 Project characteristics of projects realised by small private investors

Size of project	1989-1995		1996-1997		1998-2004	
	Number	%	Number	%	Number	%
Solitary	259	90.0	62	89.9	224	81.8
2 or 3 turbines	18	6.3	2	2.9	19	6.9
4 or 5 turbines	2	0.7	5	7.2	13	4.7
6 to10 turbines	3	1.1	0	0	15	5.3
11 and above	3	1.1	0	0	3	1.1
Average number of turbines per project	1.2		1.2		1.7	
Average capacity per project (MW)	0.2		0.5		0.9	

The first feature, the shift from a subordinate to a dominant position, has been described in chapter 3 (figure 3.2): the contribution to total capacity installed by small private investors increased from 20% in the first market period to 62% in the third market period. Although, the position in wind power generation was minor at the beginning of the 1990s, they simultaneously had a leading position with regard to the number of wind power projects that were installed.

The second feature of the performance of this group is the focus on solitary installations, combined with the relatively short lead times. The average number of turbines per project increased to a limited extent in the course of the years: the absolute dominant position of solitary installations remained (table 5.1). Simultaneously, the average capacity installed per project increased considerably. This increase is a direct consequence of technological progress. The individual turbine has become larger, and thus the average capacity per project.

Koeslag (Koeslag, 2002) conducted an enquiry into the lead times and rate of success of the different procedures for wind power projects realised in the period 1992-2002. The collected data of 220 projects covered more than half of total capacity installed in the Netherlands in 2002. About 75% of these projects were solitary installations and small private investors realised 77% of these projects. The enquiry showed that once the formal authorisation trajectory started, the probability that a wind power project succeeds was 93%. Lead times depended on the type of investor and the number of turbines, but were especially affected by objections forwarded during the procedures. The average lead time of 46 weeks (10 to 11 months) increased significantly with the size of a project: fewer objections were raised in procedures for solitary installations, which were for almost 100% installed by small private investors. Time required for informal pre-deliberations and for higher appeal procedures against the environmental permit were not included in the enquiry[3]. Therefore, in practice, the authorisation trajectory will last longer than 46 weeks on average.

We conducted a survey amongst 42 small private investors, with regard to solitary installations realised in the period 1992 up to 2002, showing that the average lead time for these solitary installation was 1.7 years (about 90 weeks) (figure 5.1). This is the time required for the authorisation of the project including the time required for informal deliberations and terms for appeal. About 33% of these projects were realised within 1 year, 78% within 2 years and 89% within three years. Formally, the period required for authorisation (exemption of the Municipal Land Use Plan, assignment of the Construction Permit and the Environmental Permit) is 1.5 years[4], which implicates that on average less than half a year was required for informal deliberations and construction. Looking at figure 5.1, we observe that the projects with longer lead times were all realised in the third period.

The third feature of the performance of this entrepreneurial group is the geographical concentration of investments in a limited number of provinces and a shift in market shares among these provinces (figures 5.2-5.3). Total capacity implemented by small private investors is concentrated in three provinces only: Friesland, Flevoland and Noord Holland. Up to 1995, Friesland was front-runner with a 51.7% market share of total capacity installed by small private investors. Flevoland and Noord Holland followed at distance with a 19.9% and 15.6% market share respectively. These positions changed over the years. The role of Flevoland strongly grew in

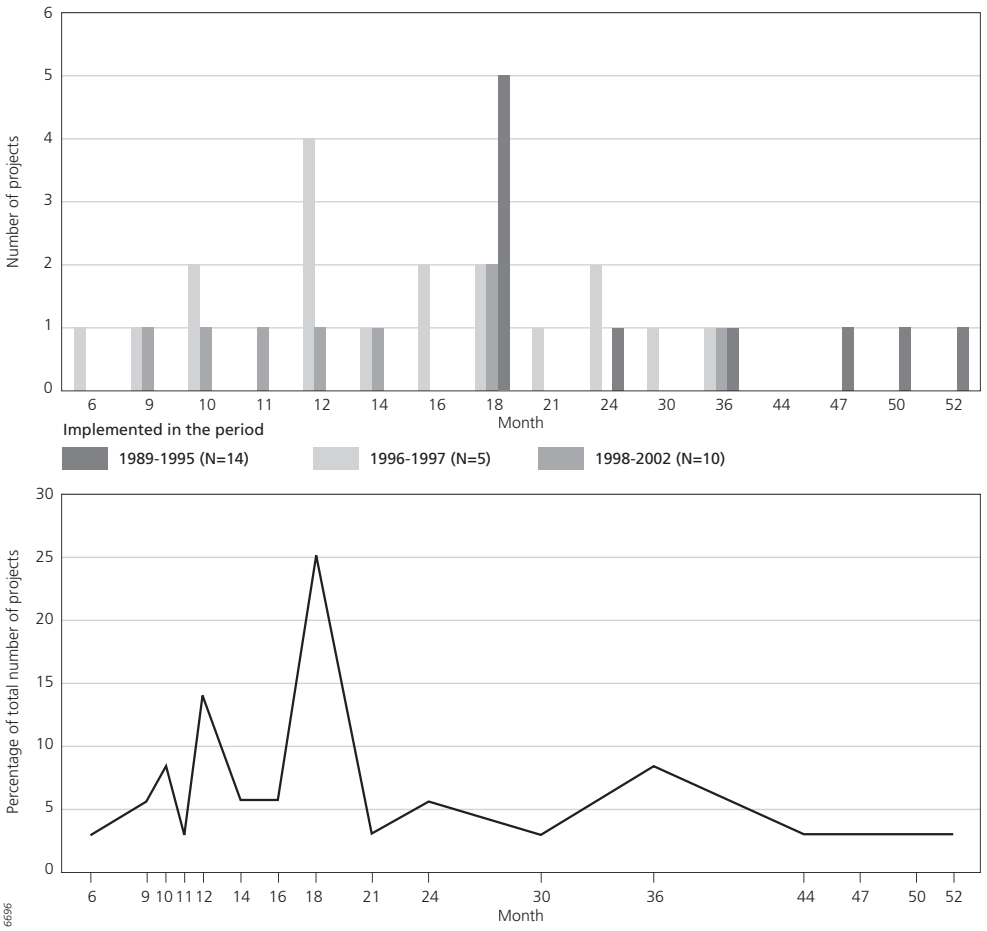


Figure 5.1 Lead times of projects realised by small private investors (1992-2002/N= 36).

the course of the 1990s with a 60.5% market share of total capacity realised by this entrepreneurial group since 1995. Developments in Friesland went in the opposite direction, with a 10% market share of total capacity realised by this entrepreneurial group since 1995. Noord Holland retained its market position.

The final feature relates to the employment of the joint ownership strategy by small private investors. Less than 5% (26 MW) of total capacity realised by small private investors has been realised in joint ownership with other types of entrepreneurs. Far more projects have been realised with the help of professional wind power developers or consultants in the field of wind power. In those cases (parts of) the development of a project is contracted out. The survey amongst 42 small private investors showed that about two thirds of the projects were realised with help of outside expertise: 50% of the projects were realised with the help of a turbine manufacturer and

17% of the projects were realised with help of an independent wind power producer or consultant. In all these projects ownership maintained fully in the hands of the small private investors.

Looking at these four features and comparing them with the market performance of energy distributors (the other entrepreneurial group that dominated the market), we observe both some similarities and differences (see also chapter 4, section 4.2). Both entrepreneurial groups show a geographical concentration in investments in a couple of so-called wind abundant provinces[5], with a dominating role for investments in Noord Holland and Flevoland since 1995. Simultaneously, substantial differences can be noticed with regard to the average project scale and lead times. The projects of energy distributors are on average more than 12 times as big as the projects of small private investors (compared in terms of capacity installed). Moreover, the average period required for authorisation of the large-scale projects realised by energy distributors is long compared to the average period for authorisation of solitary installation by small private investors.

The question arises how to explain the improving performance of small private investors and the relative short lead times that characterise their projects? This chapter explores to what extent these features can be explained by changing institutional and social conditions, such as changing

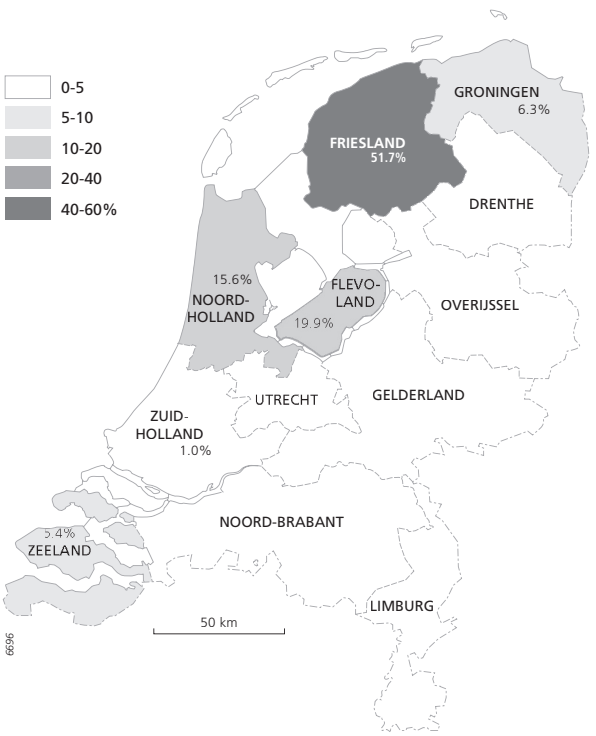


Figure 5.2 Geographical concentration of wind power capacity installed by small private investors (1989-1995) (Sources: (KEMA, 2002/2003; Wind Service Holland, 2003/2004)).

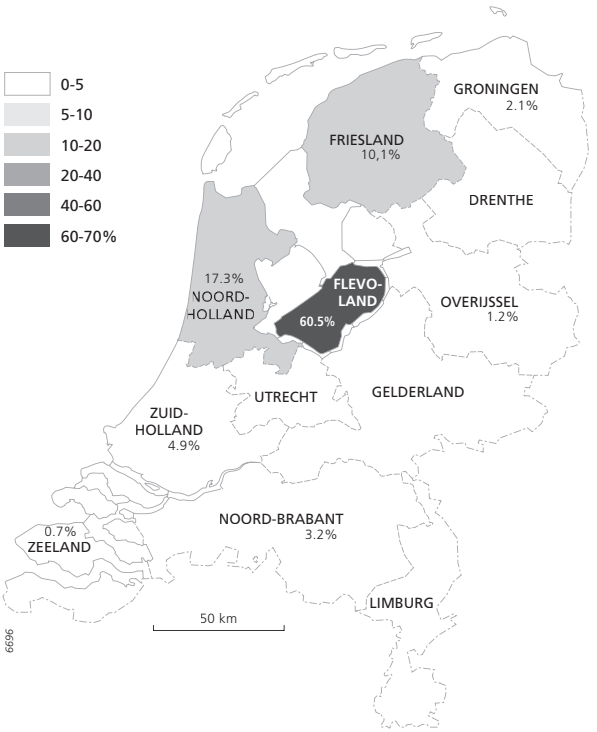


Figure 5.3 Geographical concentration of wind power capacity installed by small private investors (1996-2004) (Sources: (KEMA, 2002/2003; Wind Service Holland, 2003/2004)).

legislation, changing financial incentive schemes and strategies chosen by small private investors and other stakeholders involved in wind power implementation. The next section focuses on the effect of social and institutional conditions in the operational process of realizing solitary installations by farmers. Here we analyse the local performance of small private investors. This will give a part of the answers to these questions. Subsequently, we shift to a national perspective to enable us to analyse the effects of social and institutional conditions in each of the three market periods: *Monopoly powers (1989-1995), Interbellum (1996-1997),* and *Free market (1998-2004).* Section 5.8 concludes with a reflection on the main findings.

5.3 An inside look into the local performance of small private investors

One of the most striking features of the performance of small private investors is the relatively short lead times that characterised their solitary installations during the 1990s. This is especially remarkable given the lengthy planning processes that characterised the large-scale applications of energy distributors in those years. The former chapter showed that a variety of procedural and societal problems in the operational process of implementation negatively affected the implementation capacity of energy distributors. Especially problems with the management of the

complex legal framework and social and administrative resistance were important causes of delay. The question arises whether the same problems negatively affected the implementation capacity for small private investors? To answer this question, problems in planning and permitting of solitary installations as experienced by small private investors have been analysed in a survey among members of the Association of Wind Turbine Owners in Noord Holland (*Vereniging van Windturbine Eigenaren in Noord Holland- VWNH*)[6].

Next to the results from this survey, this section uses results from an analysis of the local performance of small private investors in the municipality of Zeewolde in the province of Flevoland[7]. Together these results cover two provinces that account for 74% of total capacity realised by small private investors.

5.3.1 Solitary installations in Noord Holland

The results of the survey are shown in figure 5.4, presenting procedural and societal bottlenecks as experienced by small private investors. These bottlenecks can be divided in three different clusters of social and institutional conditions.

The first cluster regards the procedures. Planning and permitting procedures were not problematic in 50 to 70% of the projects; and were problematic in less than 25% of the projects.

The second cluster concerns local governmental policy and political attitude. Both were not experienced to be problematic in 70% of the projects and were experienced to be highly problematic in less than 5% of the projects. The exceptional condition in this cluster is the local administrative knowledge base, which was experienced to be problematic in about 40% of the projects.

The third cluster concerns social resistance by citizens and organized pressure groups. Social resistance was problematic in only a fraction of the projects; in most of the projects it was not experienced to be a bottleneck at all.

In general, the institutional regulatory dimension and the social context were not problematic in the majority of the projects. This corresponds to the relative short lead times that characterised these projects. Exceptions were the limited local administrative knowledge base and the procedures for revision of the Municipal Land Use Plan. These conditions were experienced to be problematic in respectively 40% and 30% of the projects. However, even these two bottlenecks were in only a fraction of the projects highly problematic. How to explain this relative absence of institutional and social problems in the operational process of implementation? To answer this question, we took an inside look into the performance of small private investors in the province of Flevoland.

The success of small private investors in de province of Flevoland is a revealing story. Currently, this province accounts for some 40% of national wind total, most of it realised by small private investors. The rapid growth rate and the strong degree in which farmers came to dominate the wind power supply market in this province are not in line with national developments. Understanding the conditions that influenced these characteristic developments provides an opportunity to learn about the effect of social and institutional conditions on the performance of this entrepreneurial group. Within Flevoland, we focused on the performance of small private investors in Zeewolde, which is 1 of the 6 municipalities in this relatively 'new province'[8].

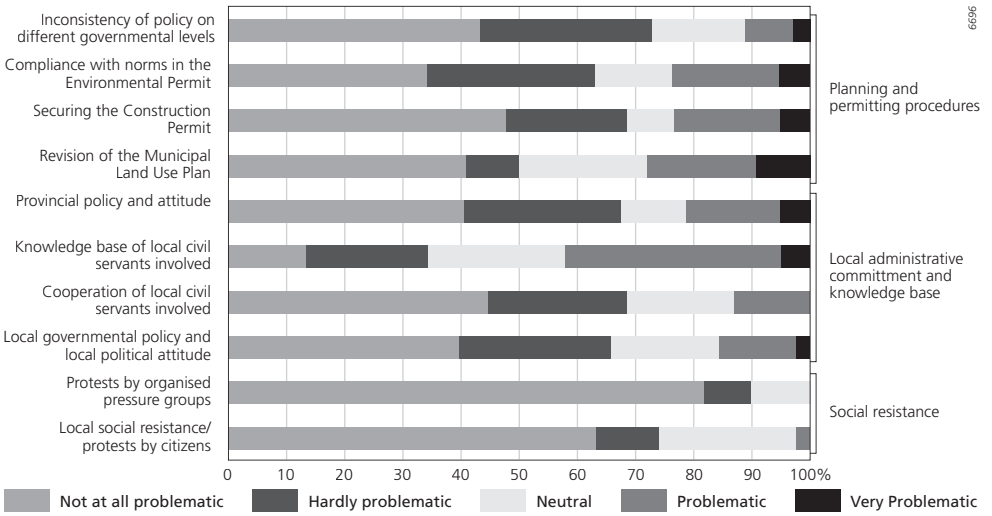


Figure 5.4 Bottlenecks in planning and permitting as experienced by small private investors (period 1990-2002/N= 42).

Zeewolde is appropriate because patterns in wind power implementation in this municipality resemble patterns in wind power implementation in Flevoland at large. Moreover, the selection of the same local administrative context, as analysed in the case 'energy distributors', enabled us to compare the performance of both entrepreneurial groups in exactly the same social and institutional setting. The effect of social and institutional conditions is analysed over a considerable part of the research period (1989-2003). Although the developments analysed are history, the analysis provides information about processes that underlie the relationships between conditions and circumstances under which these processes take place.

5.3.2 Solitary installations in Zeewolde

The municipality Zeewolde consists of a small village and a large rural area with more than 300 farms, each 30 to 40 hectare. By the end of 2003, almost 70% of the farmers in Zeewolde owned a solitary turbine or formally applied for installing one. Looking at the number of turbines installed in figure 5.5, two successive phases can be observed. The first phase runs from 1989 to 1998 and is characterised by occasional implementations of solitary turbines by farmers. With the exception of 1995[9], an annual increase of 1 to 5 turbines was realised throughout the 1990s. The second phase started in 1998 with the increase in applications for solitary installations. Those applications led, with some year delay, to a significant increase in both the number of turbines and the total capacity installed since the end of the 1990s.

Whereas the first solitary installation dates from 1990, 1993 was the first year in which a number of solitary turbines were installed. The then prevailing municipal land use plan provided for the installation of windmills up to a maximum mast height of 35 meter. A deviation of 10% of this maximum height was legally allowed and all early adopting farmers installed the then popular 80 kW Lagerwey windmill[10] on a 40-meter mast.

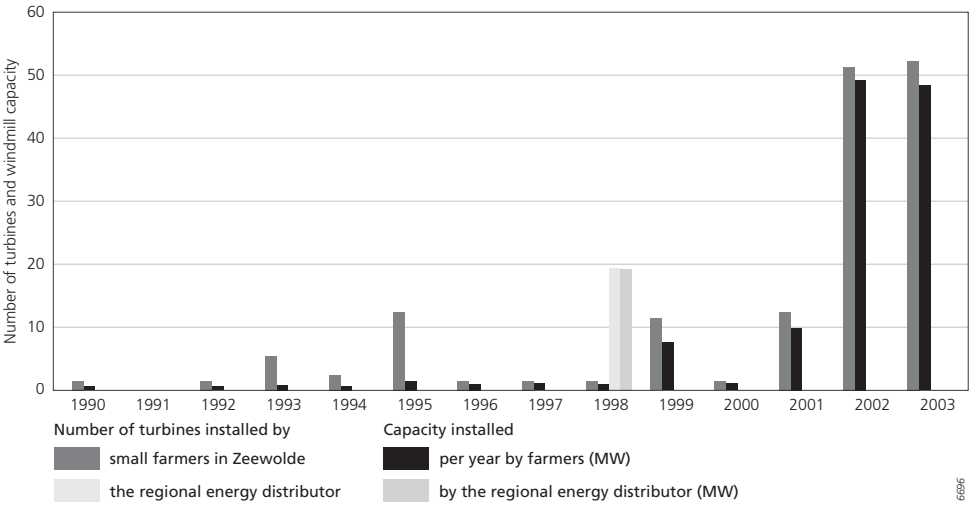


Figure 5.5 Number of turbines and windmill capacity installed per year in Zeewolde (Sources: (KEMA, 2002/2003; Wind Service Holland, 2002/2003)).

The growing international wind turbine market and continuing technological developments led to the availability of larger turbines with higher energy yields and lower production costs per kilowatt-hour. In 1994 and 1995, some innovative farmers applied for the installation of these larger turbines with mast heights up to 55 meter. At first, the municipality cooperated by adjusting the municipal land use plan for each turbine separately. However, when the flow of applications and the corresponding impact on the landscape increased the municipality decided to change this reactive policy into a pro-active policy. The market (applications by farmers) was the ultimate driving force behind this decision to formulate an explicit spatial policy on the implementation of larger wind turbines.

As will be illustrated in section 5.7, national social and institutional conditions improved for small private investors in the third market period '*Free market 1998-2004*'. The 1998 Electricity Act that solved the problems with the costs for grid connection is an example. Grid capacity had been one of the main bottlenecks for the implementation of larger wind turbines in rural areas: large additional investments were required to realise grid connection. The 1998 Electricity Act introduced rules that solved this problem; as of that moment grid administrators were compelled to connect turbines against fixed costs. The sharp increase in the number of farmer initiatives installed in Zeewolde is in line with the improved national social and institutional conditions for this entrepreneurial group. However, these improved national conditions were not utilized everywhere to the same degree: the installation of farmer initiatives did not increase at all in provinces such as Groningen and Friesland. It seems as if the improved conditions on national level were necessary but insufficient conditions for implementation. The increase in the number of farmer initiatives installed in Zeewolde was not only in accordance with changes in national social and institutional conditions but also with local social and institutional developments. Quite a few local social and institutional conditions had to be fulfilled to actually enable

implementation. The first one was willingness at the side of the local authorities to cooperate in planning.

When the authorities in Zeewolde decided to start a process of policy making on the issue of wind energy implementation early 1996, they adopted a positive attitude towards solitary installations by farmers. The following reasons underlay this positive attitude.

First, the idea of enabling every farmer to establish a wind turbine on its land was an indirect effect of problems encountered by the municipality with the implementation of a large-scale wind power project by the regional energy distributor (see chapter 4). Social resistance against this project was fierce and the project became a breeding ground for conflict within the agrarian community. The agrarian community constitutes an important part of the entire community in Zeewolde. It therefore was important for local politicians to remain on good terms with this group and to search for a policy that served their interests.

Second, for most of the farmers the main motive for implementing a wind turbine was and is a financial one. Due to a favourable financial incentive system since the end of the 1990s (see section 5.7) farmers in Zeewolde expected to earn about € 50.000 per year over the whole depreciation period on an investment of a million. *'We make more money with the sales of electricity than with farming nowadays*[11]". A policy that would enable every farmer to establish a turbine on its land served the economic interests of the rural community. Knowing that the rural community in Zeewolde constitutes an important part of the entire community makes it easy to see that such a policy simultaneously served the private and the common interests. In this case, all actors shared the same private interests.

The operational process of policy making

Support on local governmental level for the implementation of solitary turbines by farmers was an important social condition in the policy making process that led to the establishment of an explicit spatial policy at the end of 1999. As of that moment, local administrative authorities and local planning policy were directed at facilitating farmers. The policy making process had taken nearly 4 years. Informal deliberating between (1) the municipal authorities and farmers, (2) the municipal en provincial authorities and (3) the municipal authorities and a third market actor (a broadcasting station) had been required to finally establish the 'Windmill Axes Plan' (WAP). Some individual farmers and their representative associations were involved in all these deliberations.

The Windmill Axes Plan was grounded on the existing parcel division of the central area of the municipality. This part of the municipality is a 1970s product, devised by skilled planners. It is rationally divided in straight parcels and straight roads, which theoretically form a perfect base for creating straight line-ups by placing 1 turbine on every parcel. It enabled a perfect compromise, meeting the wish for line-ups and the wish for solitary installations.

Local farmers seriously recoiled from the first version of WAP. The turbines were planned in such a way that farmers were forced to lease additional land, which implicated a considerable increase in investment costs. Informal deliberation between the municipality, some individual farmers and their representative associations[12] led to adjustment of the plan in accordance with the wishes of the farmers: the municipal authorities approved a new plan in June 1997.

Inconsistency between the adjusted plan and prospective provincial spatial policy on wind energy required renewed deliberation. Already since 1996, administrative discussions within the provincial authorities indicated a new policy direction: solitary turbines were not to be permitted. This ban on solitary turbines became formal provincial policy in 1999. WAP was not in line with this new provincial policy direction. It took two years of administrative deliberation and intensive lobbying by the municipal executive (including a role for some individual farmers and their representative associations) before the provincial council accepted the deviating municipal policy on wind energy in Zeewolde. Main reason for acceptance was the existing parcel division in the WAP-area: implementation of solitary turbines would lead to the creation of straight line-ups[13]. In 1999, the provincial council officially approved WAP and included it in a new Regional Land Use Plan.

Now that the province accepted the deviating municipal policy, the Dutch Network Broadcasting Station (Nozema), situated in the WAP-area, claimed that realisation of WAP would lead to unacceptable disturbance. The municipality commissioned a study[14] on this matter, which clarified that Nozema was right on this claim. Again, deliberation was required. This time, Nozema, municipal authorities and some individual farmers in the WAP-area were involved. The result was that in a circular area around the broadcasting station maximum mast heights became limited to 30 meters.

Securing sites and permits

The positive local administrative attitude towards solitary installations by farmers was an essential social condition in the operational process of policy making that resulted in the establishment of the Windmill Axes Plan (WAP). This plan, in turn, was a positive institutional condition. These positive local conditions contributed to the implementation capacity for small private investors, but were insufficient conditions for rapid implementation. Implementation demands the building of another capacity, which presence is not self-evident. A municipality must be prepared to build administrative capacity to manage the different permitting procedures in a consistent way and to be able to assess wind power projects on legally fixed norms on complex matters, such as noise hindrance.

In Zeewolde, the establishment of a local administrative 'Bureau Windmills' in 2000 contributed to the required administrative capacity. After the administrative problems encountered during the planning and permitting of a large-scale wind power project of the regional energy distributor (see former chapter) awareness had grown about the administrative complexity of implementing wind turbines. Moreover, the increase in applications for solitary installations necessitated a professional management approach. The main reason for setting up Bureau Windmills was to provide for one local governmental counter for wind power entrepreneurs and a planning and permitting process of high quality. A second reason to establish Bureau Windmills was the policy preference for implementation by farmers. Bureau Windmills intended to simplify the procedures for this entrepreneurial group. Direct consultation between farmer-investors and Bureau Windmills became standard. For instance, at the time (2001) the Provisions and Installations Environmental Management Decree came to replace the Environmental Permit for small-scale and solitary projects[15], Bureau Windmills created a standard form of application, which was actively spread amongst this entrepreneurial group. It led to an additional acceleration in solitary installations in 2002 and 2003 (figure 5.5). Due to

Bureau Windmills, the scope and structure of knowledge both at the side of the municipality and the side of individual farmers increased.

Even though things seemed to go smoothly for small private investors in Zeewolde, there arose some complex bureaucratically constructions. The existence of the Windmill Axes Plan and Bureau Windmills were important local conditions that added to the implementation capacity of this entrepreneurial group. We will show that the effect of these positive conditions depended to a large degree on the prevailing social setting.

Whereas the municipal executive established WAP in 1999, the city council never officially approved the plan. This implicated a rather strange administrative situation in which the provincial council agreed on a deviating municipal policy that never had been approved by the city council itself. Because WAP was never officially approved by the city council and the municipal land use plan was never officially revised, a separate exemption procedure was required for every single turbine. Within the legal framework of such an exemption procedure, approval of the provincial executive is required. In the matter of this approval, the regional inspector on spatial planning of the Ministry of Housing, Spatial Planning and Environment is legal ad- and supervisor. This advice turned out to be negative for every application for exemption because WAP deviated from national spatial policy guidelines on wind energy[16]. The provincial executive solved this problematic situation by structurally disregarding the negative advices, which was possible because the formal negative advises were always accompanied by a verbal agreement that the inspector would not start a formal juridical procedure.

This inconsistent administrative situation could have been ended by officially including WAP in the municipal land use plan. However, within the legal framework of revising a municipal land use plan, legal advice must be obtained from the same inspector on spatial planning. Of course, this advice was expected to be negative. This was one of the reasons for the municipality not to opt for this solution. A second reason was the period required for revision (60 to 112 weeks depending on the amount and timing of objections). Revision of the municipal land use plan would have implicated considerable delay for the individual farmer-investors and would have interfered with the municipal policy point of departure of facilitating farmers in establishing solitary turbines on their land.

A separate exemption procedure for every single turbine implicated a multitude in chances for objection. However, after running through the first 45 separate procedures for 45 solitary turbines within the WAP-area, not one formal objection was raised. Municipal policy to implement WAP by way of separate exemption procedures was effective only because of the absence of local social resistance.

Collaborative arrangements

Collaborative arrangements among farmers and short communication lines to local authorities contributed to the implementation capacity for the farmers in Zeewolde. These positive social conditions added to the scope and structure of their knowledge and to their bargaining position on the liberalising market.

The shared economic interest in wind power exploitation was the main driver for farmers to collaborate. Each road in the WAP-area corresponded to one joint farmers-initiative and usually, one or two farmers managed each farmer-initiative[17]. During the planning and permitting procedures, contact with Bureau Windmills went by way of the farmer representatives and on

aspects like the purchase of turbines, grid connection and the sale of the electricity, collaboration enabled to keep down turbine prices. Acting collectively was to the financial advantage of every farmer within the area.

The farmers united themselves in the regional umbrella association VWIJ -'Association of Wind Turbine Owners in the IJsselmeer area' which had been involved in the policy making process of WAP[18]. Every farmer, installing a wind turbine in Zeewolde, was or became a member of this regional umbrella association. As of 2002, this uniform trend changed however: not every farmer automatically applied for membership any longer. This may be the result of the fact that things ran so easy, not only with regard to the permitting process but also with regard to the financing of projects. In 2003, lead times of 2 to 3 months were achieved for all the required planning and permitting procedures[19].

Besides voluntary collaborative arrangements driven by shared economic interests, business arrangements with other categories of entrepreneurs played a role. In 1997, two independent wind power producers emerged on the wind power supply market in Zeewolde[20]. They have been associated with the implementation of half of the projects[21]. The majority of these projects stayed in full ownership of the farmers themselves. There was no reason for sharing ownership with the independent wind power producers. In the period 1998-2002, almost all financial institutions offered farmers financial constructions to realise wind power projects without investing private capital, and therefore against very limited risks. Only the farmers that were situated in the circular area around the broadcasting station (where the mast height was limited to 30 meters) were inclined to give up ownership. '*Revenues decrease with decreasing mast height. The mast height restriction was reason for me to pass in ownership and accompanying risks to a professional wind power developer. Those developers exploit the turbines on a different basis. They are able to make full use of all available fiscal incentive schemes, which are not much use for farmers*[22]'. Farmers followed an economic rationality: sharing ownership with other entrepreneurial groups is purely based on economic arguments.

Changing conditions after the implementation of WAP

Two unanticipated consequences resulted from the implementation of WAP. First, WAP turned out to be an expensive municipal affair. It required considerable administrative capacity to settle a separate exemption procedure for every single turbine. Initially, Bureau Windmills was raised for a period of two years. However as from the moment that the Bureau was disbanded (January 2003), the municipal department on spatial planning became flooded with extra work. To solve this problem, Bureau Windmills II was established to complete the task[23]. A second consequence that never occurred to the municipality in advance was the result of WAP in actual practice. WAP was grounded on the existing parcel division of the polder, which theoretically forms a perfect base for creating straight line-ups by placing 1 turbine on every parcel. This idea of creating straight line-ups had been the main reason for the provincial authorities to finally accept the deviating municipal policy on solitary installations. However, actually the roads bend slightly. As a result, the line-ups cannot be identified from the ground, and in actual practice look chaotic.

There still is no explicit municipal policy on wind energy in a different part of the municipality. In this part of the polder, the regional energy distributor implemented a large-scale wind power

project, which has been associated with fierce public resistance. Apart from this project, only some small wind turbines on 40-meter masts are located in this area. Analogous to developments in the WAP-area, the flow of applications in this area increased in recent years, which again asks for municipal policy formation. Both the municipality and the province are unwilling to assist in the formation of a spatial plan like WAP again, because this new area is not divided in straight parcels and roads and it comprises some nature conservation areas. It therefore is more difficult to comply with legally fixed norms on nature conservation aspects. Moreover, national and provincial policies do not allow solitary installations any longer. Consequently, the municipality has decided to follow a contrary policy strategy. The municipal land use plan will be formally revised: no implementation by way of separate exemption procedures for every single turbine. Clustering on a limited number of locations will be required and the municipality has formulated an explicit demand for participation: a consequence of the problems encountered with the large-scale wind project of the regional energy distributor. The demands for clustering and participation force the farmers to collaborate and they have raised the 'Association Development Wind energy'. This association submitted an application for four wind power locations at once. The four line-ups together contain 41 turbines. These applications are deferred until the moment that the municipal land use plan will be officially revised. Herewith, local planning radically changed in the course of 7 to 8 years.

5.3.3 Social and institutional conditions in the operational process of implementation

Figure 5.6 provides an overview of local social and institutional conditions as constituent elements of the implementation capacity for small private investors in the municipality Zeewolde. Looking at this figure, we observe that many local social conditions contributed to the implementation capacity for this entrepreneurial group. The positive local administrative attitude towards solitary installations and the collaborative approach of policymaking are important examples. These social conditions were essential in the operational process of policy making that resulted in the establishment of an explicit spatial policy on wind energy: the Windmill Axes Plan (WAP) (figure 5.6, arrow 1). The operational process of policy making took several years and involved informal deliberation between various stakeholders among them local farmers and their representative associations.

Although the positive local administrative attitude, the collaborative approach of planning and the resulting Windmill Axes Plan were important local conditions that contributed to the implementation capacity for small private investors, they were in themselves insufficient conditions for rapid implementation. Implementation demanded the fulfilment of another condition: local administrative capacity to manage the different permitting procedures in a consistent way. Bureau Windmills was raised to fulfil this demand.

Bureau Windmills enabled short communication lines between farmer-investors and local administrative authorities. These short communication lines, combined with the establishment of collaborative arrangements among farmers additionally contributed to the implementation capacity for this entrepreneurial group. These social relations like authority relations and relations of trust, facilitated coordinated actions, like the joint lobby of the municipal authorities and farmers to induce the provincial authorities to accept WAP (figure 5.6, arrow 2). Moreover, collaborative relations added to the scope and structure of knowledge and to the bargaining position of the small private investors on the liberalising market.

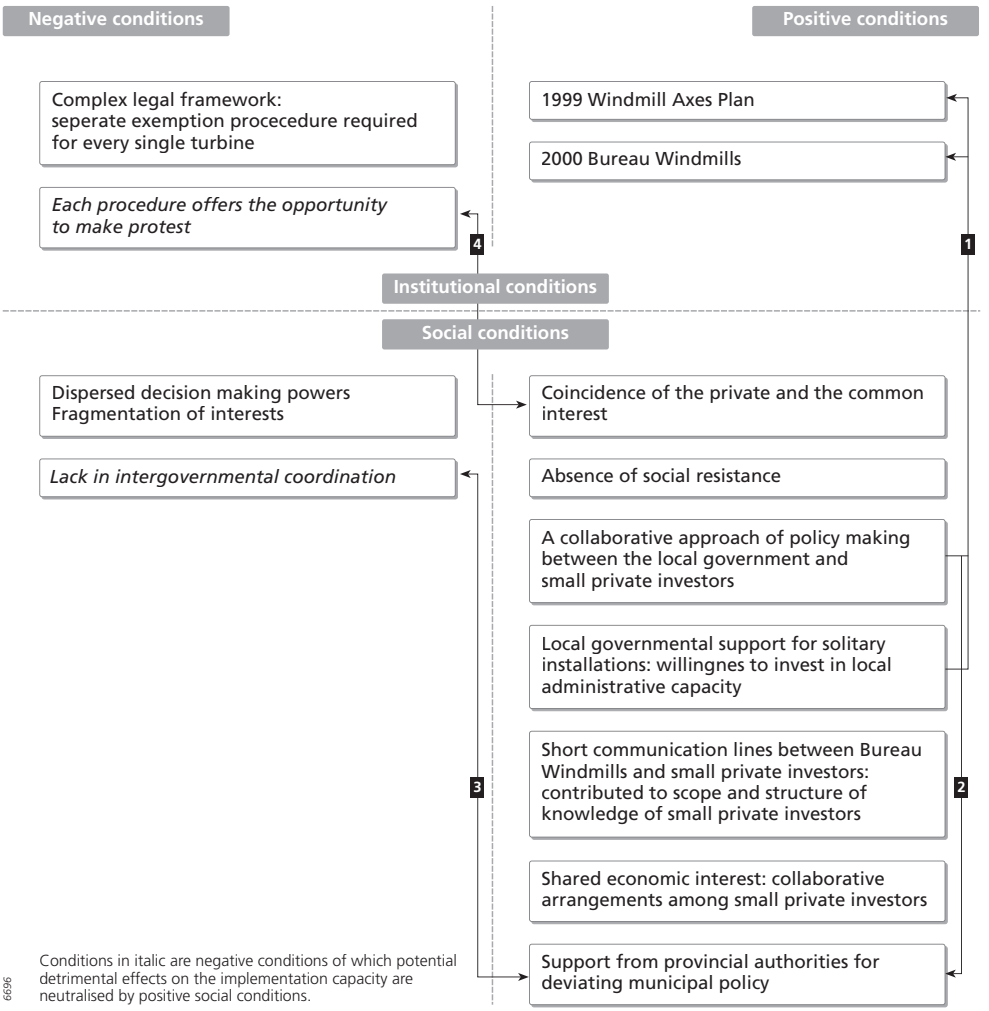


Figure 5.6 Constituent local social and institutional conditions of the IC for small private investors in Zeewolde

The prime driver for the municipality to adopt a positive and pro-active attitude and for the establishment of collaborative arrangements among farmers was the coincidence of the privatee and the common interests. The rural community that benefited from wind power exploitation constituted an important part of the entire community. This homogeneity in the community also explains the absence of local resistance. Social coherence, with the shared economic interest being the main driver, contributed to the implementation capacity for small private investors.

The analysis furthermore shows that the formal legal framework is only one of the regulating mechanisms that steer developments; interests and informal contacts are evenly important.

An example is the implementation of the WAP on an ad hoc basis, and the role in this of the regional Inspector of the ministry of Housing, Spatial Planning and the Environment. It illustrates the importance of a social setting for the exact working out of institutional conditions. The lack of formal intergovernmental coordination (WAP deviated from national spatial policy guidelines) was not a problem because of provincial governmental support, which in turn was a consequence of intensive municipal lobbying (figure 5.6, arrows 2 and 3). Implementation of WAP on a hoc basis implicated separate exemption procedures for every single turbine, which is a negative institutional condition because every procedure offers the opportunity to make protest. However, this institutional condition was not a problem because of the absence of social resistance (figure 5.6, arrows 4). It once again illustrates that an institutional condition or structure is not a bottleneck in itself. It is the way stakeholders deal with this institutional structure that clarifies implementation.

Finally, the inside look shows that possibilities for entrepreneurs change. The shift from a policy aimed at solitary installations by way of separate exemption procedures for every single turbine to a policy aimed at clustering by formally revising the municipal land use plan is illustrative for this evolution of policy. Social and institutional conditions are transient. The consequence is that the implementation capacity is transient too. A high implementation capacity for a certain type of entrepreneur corresponds to a moment upon which not only national conditions are positive, but also the required local capacities are fulfilled.

The inside look into the local performance of small private investors provides an explanation for several of the features of the performance of this entrepreneurial group, such as the focus on solitary installations, the limited employment of the joint ownership strategy and the relative short lead times. It is not clear however to what extent the geographical concentration of investments and the shift in market position of this entrepreneurial group can be explained by processes of local capacity building. Therefore, the next section shortly looks at the concentration in investments related to processes of regional and local capacity building in other Dutch provinces. After that, we will make an additional analysis of the entrepreneurial group as a whole to explain the shift in market position.

5.4 General applicability of social and institutional conditions

One of the features of the performance of small private investors is the strong concentration of investments in a limited number of provinces and a shift in market shares among these provinces (see figures 5.2 and 5.3). These different developments between (coastal) provinces cannot be explained by differences in wind conditions or differences in national social and institutional conditions. This evokes the question to what extent these differences can be explained by processes of local capacity building. By analysing the local performance of small private investors in the provinces of Flevoland and Noord Holland the analyses focused on explaining success stories. These success stories illustrate the importance of processes of local capacity building, but simultaneously evoke the question to what extent the fulfilment of these local capacities is representative for other Dutch provinces over the last 15 years. What can for instance be said

about local developments in Friesland and Groningen, i.e. two provinces that have been less successful in terms of wind power capacity installed by small private investors?

Solitary installations by farmers in Friesland dominated the wind power supply market in terms of the number of turbines installed at the beginning of the 1990s[24]. Municipalities in this province cooperated by adjusting the municipal land use plan for each turbine separately and short lead times were achieved. Halfway the 1990s, the large number of solitary installations and some large-scale initiatives by the regional energy distributor led to an increase in social resistance, which affected the operational process of policy making in this province. As of the year 2000, each municipality was requested to replace existing solitary installations by one large-scale municipal location: the installation of new turbines would only be allowed if existing turbines were replaced (Province of Friesland, 2000). This provincial policy favoured existing wind turbine owners (mainly farmers) and blocked the possibilities for other entrepreneurs. Implementation of this policy turned out to be laborious: most farmers preferred to retain their existing solitary installations.

Groningen is a different story. In this province, provincial authorities strongly focused at the regional energy distributor for wind power implementation at the beginning of the 1990s: the provincial target was realised through the installation of some large-scale projects by the regional energy distributor (see chapter 4 section 4.3). Also in this province, the operational process of provincial policy making on wind energy took several years and was affected by social resistance. As of 1999, wind energy exploitation has been defined as an industrial activity only allowed at a restricted number of large-scale industrial locations (Province of Groningen, 1998,, 1999). This policy favoured large wealthy investors and blocked the possibilities for decentralised generation by small private investors[25]. The implementation of this policy (the implementation of a limited number of large-scale projects) is however considerably delayed by fierce social resistance.

In both provinces disappointing implementation rates by small private investors can be explained by regional and local institutional regulatory and social developments. It once again illustrates the importance of regional and local social and institutional conditions and the temporary character of these conditions for the developments in implementation capacity.

5.5 Monopoly powers (1989-1995)

The major institutional change that determined implementation capacity developments in this period was the 1989 Electricity Act. This act compelled energy distributors to purchase all the electricity generated by decentralised small private producers located in the area in which they had monopoly on supply. This obligation was imposed regardless of the amount of electricity offered and for an indefinite period. This institutional condition created a very peculiar market for small private wind power entrepreneurs. It would seem to have been a favourable situation, but actual conditions for redelivery and payback tariffs had to agreed on a case by case basis by the energy distributor and the private party.

The 1989 Electricity Act prescribed that energy distributors had to pay '*the most stimulating compensation*' for renewable energy. However, '*the most stimulating compensation*' turned out to be an ambiguous formulation: the law was not clear on this aspect. The methods for calculating this compensation were set out in the 'Standard Arrangements for Redeliveries' (SAR), part of the Electricity Act, and were revised annually.

Payback tariffs consisted of the avoided costs component (SAR) and the MAP-levy (see chapter 3 section 3.3.2). Energy distributors imposed the MAP levy on consumer tariffs, which enabled them to support the generation of wind energy. Both the SAR and the MAP levy were institutional conditions with a strong element of self-regulation: energy distributors decided on the distribution of the MAP subsidies and the actual conditions for the payback tariffs had to be agreed on a case by case basis. This peculiar configuration of institutional and social conditions was far from ideal for small private investors. Small private investors, who were obliged to sell their electricity to the regional energy distributor, were dependent on this company for both the SAR component and the MAP subsidy – a company that was also their competitor on the wind power supply and green electricity market (see figure 5.7, arrow 1). The result was a rather weak implementation capacity (compared to the electricity sector), which partly explains why small private investors lagged behind the electricity sector, both with regard to the number of turbines and total capacity installed during this period.

The picture was different with regard to the number of projects realised. The predomination of small private investors in this area can be explained by the fact that most of them, being farmers, were able to make free use of land to place a solitary turbine. This social condition created an advantage that also explains why this type of entrepreneur was the second most important investor during this period. With regard to the assignment of MAP subsidies and the SAR component, other types of entrepreneurs were in the same disadvantaged position as small private investors, but with the additional disadvantage of not having a site location.

In 1992, the Union of Private Wind Turbine Operators (*Particuliere Windturbines Exploitanten-PAWEX*) took an action for arbitration against the Federation of Energy Distributors in the Netherlands (*EnergieNed*) concerning the meaning of 'the most stimulating compensation' for renewable electricity as defined in the 1989 Electricity Act (see figure 5.7, arrow 2). The Ministry of Economic Affairs, the only actor able to amend this section in the act, stayed in the background during this discussion, leaving the dominant position of the energy distributors undisturbed[26]. The arbitration case went with difficulty. In August 1994, an independent committee decided that no additional compensation for wind power was required[27]. This was a disappointing judgment for private wind power producers, leaving them two important bottlenecks (pay-back tariffs and costs for grid connection). In 1995, consultation between EnergieNed, PAWEX and the ministry of Economic Affairs finally led to a new national payback regulation for projects below 2 MW realised in the years 1995 and 1996[28]. No regulation was agreed upon for the problems with the costs for grid connection (Energie Verslag Nederland, 1994; Wind Service Holland, 2004).

Parallel to the arbitration case, PAWEX was able to reach bilateral agreements with several distributors. Some electricity companies started to pay a reasonable compensation per kWh produced by private wind power producers. The Friesland provincial electricity company and the Noord Holland electricity company were among the first to offer a higher payback tariff. A correlation can be noticed between these improved financial conditions for private wind power exploitation and wind power market shares in these two provinces (see figure 5.2).

The end of the first period is instructive. The anticipated switchover from the subsidy system to the fiscal system in 1996 also caused the number of projects, turbines and total capacity installed by small private investors to peak. Most likely because of increased pressure on municipalities, both on the part of entrepreneurs and higher government authorities. This pressure was dictated

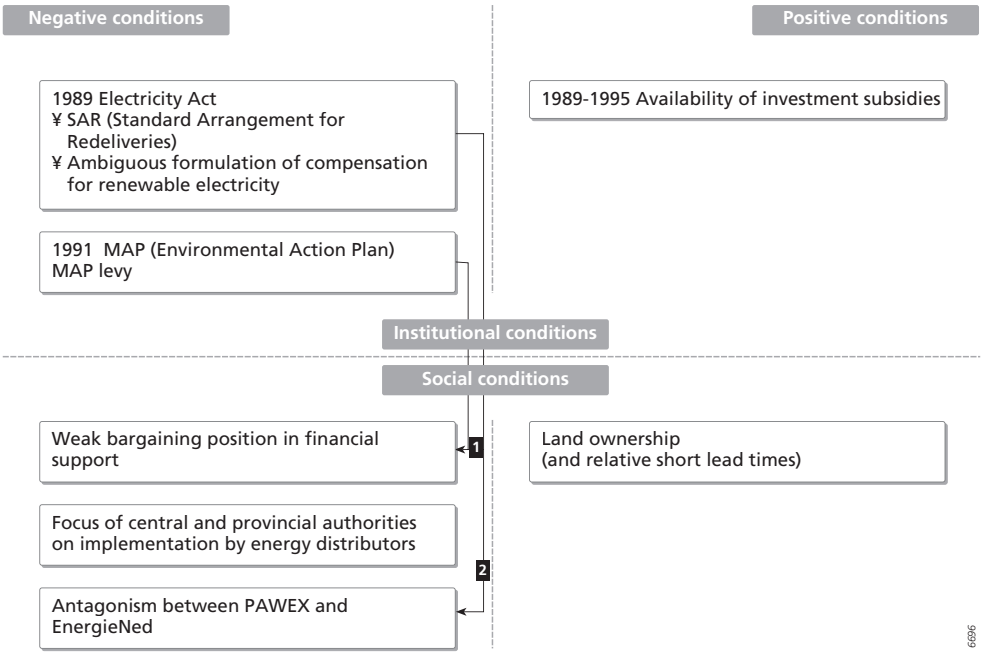


Figure 5.7 Constituent conditions for the implementation capacity for small private investors in the Monopoly powers (1989-1995).

by the fear of losing subsidies already assigned by the national authorities. The 1995 peak indicates the possibility that considerable tension between conditions can result in a sudden and temporary increase of the implementation capacity.

5.6 Interbellum (1996-1997)

The major institutional change in this period was the gradual introduction of fiscal instruments, but we see also impacts of continuing technological developments.

The new fiscal incentive system implemented early 1996 was accompanied by uncertainty, unfamiliarity and scepticism about government financial policy (see figure 5.8, arrow 1). It resulted in non-responsiveness on the part of small private investors during the first two years following the shift to this system. Furthermore, the unfavourable institutional and social conditions (SAR and MAP) of the previous period still existed. In keeping with this, the number of projects, turbines and total capacity installed by small private investors declined during these years. Instability of government financial policy, combined with hampering institutional and social conditions, caused the implementation capacity to decrease for small private investors.

The introduction of the REB tax or ecotax in 1996 (Art. 36o of the Environmental Management Act) contributed to the antagonism between EnergieNed and PAWEX (see figure 5.8, arrow 2). PAWEX took the view that the REB tax should be added to the payback tariffs agreed

upon in long-term contracts by distributors and private wind power generators. EnergieNed, on the contrary, was of the opinion that the tax should not be added in those cases in which the contractual payback tariff exceeded the sum of the avoided costs component (SAR) and the REB tax. No agreement had been reached on this point in the 1995-consultations between EnergieNed, PAWEX and the ministry of Economic Affairs because both PAWEX and EnergieNed thought to possess a strong legal position[29] (Wind Service Holland, 2004). Also the ministry of Economic Affairs failed to provide for an unambiguous transitional arrangement. This made small private power investors in the provinces of Noord Holland and Flevoland going to court to obtain clarity about the interpretation of the contractual payback tariffs in view of

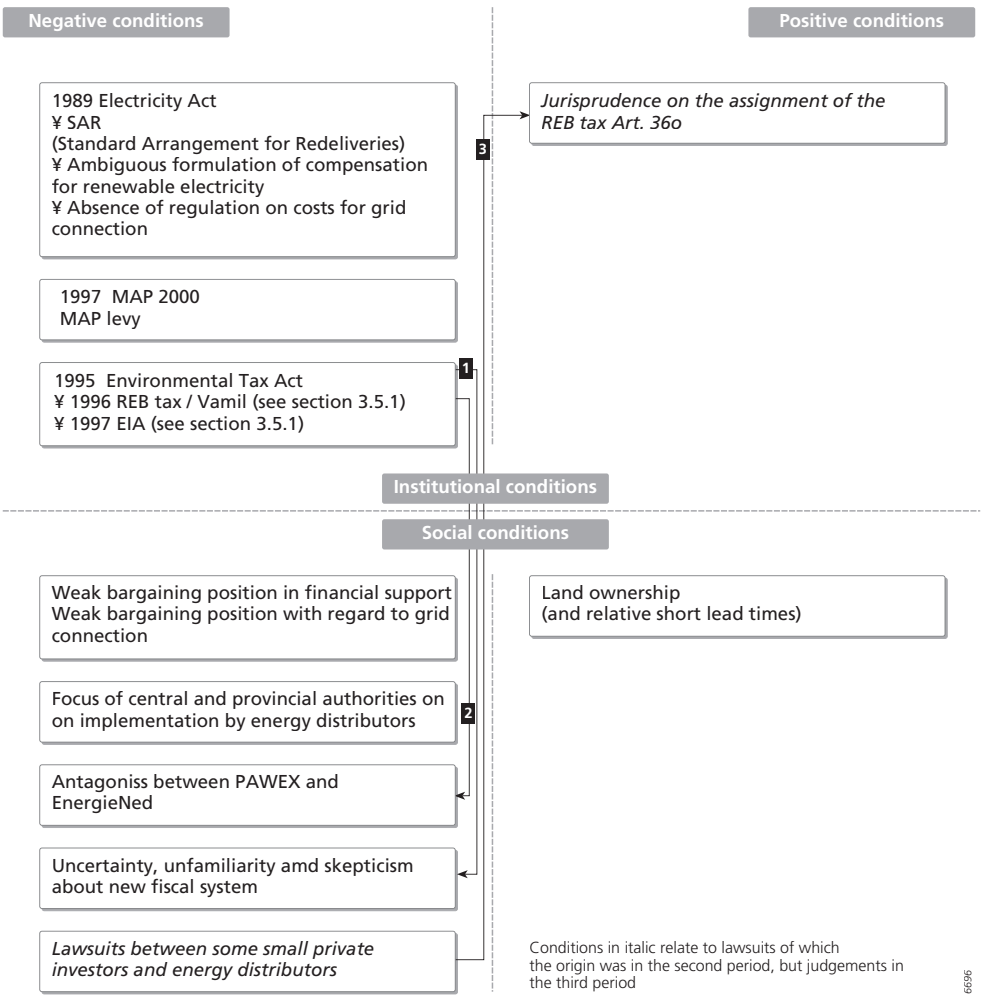


Figure 5.8 Constituent conditions for the implementation capacity for small private investors in the Interbellum (1996-1997).

the Environmental Tax Act[30]. These small private investors won these lawsuits, all in appeal to a higher court[31] (see figure 5.8, arrow 3).

We also have to discuss the impact of continuing technological developments, which led to the availability of larger turbines in this second market period. The local grid in rural areas was usually not adequate for connecting the turbines, which brought with it higher connection costs (LEI, 1999). These costs became one of the main bottlenecks for small private investors. They lacked insight into the cost calculations for grid connection as provided by the regional energy distributor and they had to bear the majority of the costs. No formal regulation was available and many projects failed on this point[32].

It took small private investors some years to 'discover' the newly created (and in fact, favourable) investment climate[33] and to take advantage of the new fiscal incentive instruments (the VAMIL and EIA schemes, the EINP scheme and in particular the REB tax scheme) (see Chapter 3 section 3.5.1). Some small private investors stated that under the new fiscal scheme they were at a disadvantage compared to large investors, for the simple reason that they had lower profit margins (Van der Knijf, 1999). However, more important for the position of this entrepreneurial group was the future liberalisation of the green electricity market, as we will see in the next section.

5.7 Free market (1998-2002)

The major institutional changes that determined implementation capacity developments in this period were (1) the liberalisation of the wholesale market and accompanying rules for grid connection, (2) the greening of the fiscal system and market compatible financial instruments, (3) the liberalisation of the green consumer market and (4) the demand for the clustering of turbines. This section illustrates that the consequences of these institutional conditions for small private investors were the opposite of the consequences for energy distributors as described in the former chapter. Looking at figure 5.9, we observe the many positive institutional and social conditions in this period: the pros of the liberalised market exceeded the cons for small private investors, with an increase in the overall implementation capacity. For the first time this entrepreneurial group started to surpass the electricity sector in importance (figure 3.2).

The most important institutional change was the 1998 Electricity Act, which created the legal framework for the liberalisation of the wholesale market. The liberalisation caused the disintegration of the monopoly powers of energy distributors. Small private investors were no longer obliged to sell their electricity to the regional energy distributor, which meant that the bargaining power of small private investors increased. Moreover, the Electricity Act regulated the guaranteed and immediate access to the grid for private producers. The Act compelled each grid operator to make a proposal about the terms for grid connection, which were to be tested by the independent Office of Energy Regulation (*Directie toezicht electriciteit Dte*). Dte, however, turned out to be insufficiently capable of fulfilling the task as independent supervisor. Large differences in costs for grid connection for apparently identical situations led to agitation at the side of private producers[34] and to questions in Dutch Parliament (Minister of Economic Affairs,

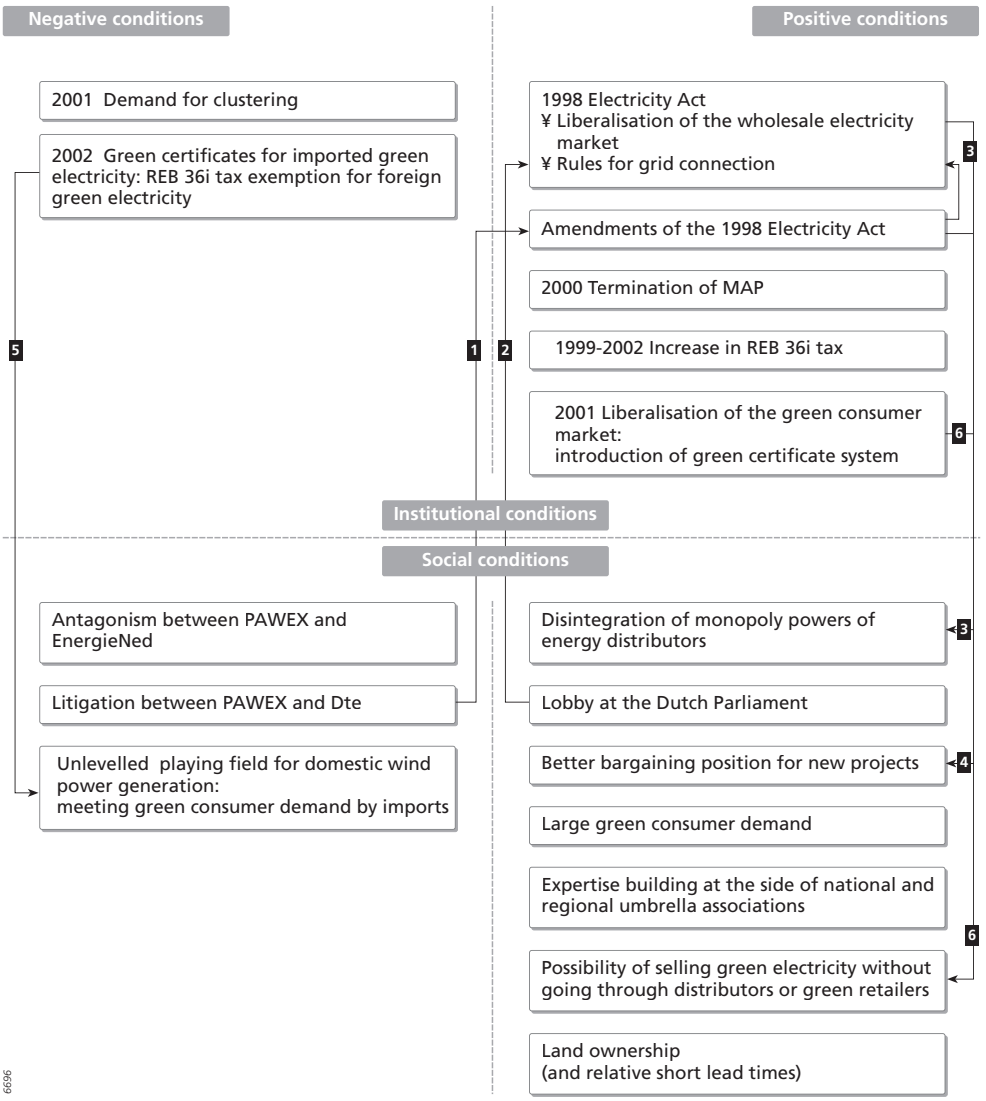


Figure 5.9 Constituent conditions for the implementation capacity for small private investors in the Free market (1998-2004).

2001; Tweede Kamer der Staten Generaal, Vergaderjaar 1998-1999). PAWEX in cooperation with other representative associations started an intensive lobby at the Dutch Parliament to amend the 1998 Electricity Act. In addition, PAWEX litigated over several aspects associated with the rules for grid connection and the implementation of these rules in actual practice. Many resolutions of Dte were repealed and the 1998 Electricity Act changed in accordance with a number of amendments (see figure 5.9, arrows 1 and 2). Since 2000, tariffs for grid connection for projects up to 10 MW are fixed and a formal deadline of 18 weeks for grid connection was

set in June 2004. Although it took some years to repair the shortcomings in the rules for grid connection and the implementation of these rules, the changes in institutional and subsequently social conditions resulted in increasing implementation capacity for small private investors (see figure 5.9, arrow 3).

A second positive institutional change in this period was the greening of the fiscal system. Domestic and imported renewable electricity have been exempted from the REB tax since 1998. The increase in this tax in subsequent years led to favourable economic conditions for wind power exploitation, which enlarged the implementation capacity for wind power entrepreneurs in general. In addition, the implementation of the Green Label system in January 1998 and the replacement of this system by the green certificate system in 2001 gradually led to improved payback tariffs for private investors. These economic policy instruments replaced the MAP subsidy and added to the bargaining position of small private producers in financial support for installing new wind turbines (see also chapter 4, section 4.5 and 4.6 and figure 5.9, arrow 4). With regard to existing projects and contracts in force, the introduction of the green certificate system caused dissension between small private investors and energy distributors (similar to the introduction of the REB tax). Again several lawsuits between private producers and energy distributors occurred. This time to obtain clarity about the interpretation of the contractual payback tariffs in view of the new green certificate system. According to the sentences, private producers were obliged to transmit the green certificates to the energy distributors, without an additional compensation (Paardekooper, 2002:14)[35]. PAWEX and the regional associations of wind turbine owners negotiated with distributors on adaptations of the contractual payback tariffs. Most of these negotiations went with difficulty[36]. The majority of the members of Association of Wind Turbine Owners in Friesland terminated their contracts with Nuon, and started selling their electricity to Obragas (Politiek, 2002: 15).

The third institutional change in this period is the liberalisation of the green consumer market in 2001. The liberalisation of the green consumer market brought both some advantages and disadvantages for small private producers. The liberalised green consumer market, together with the REB tax exemption for foreign green electricity, created an unlevelled playing field. New, still to be installed, domestic wind power had to compete with cheap, already written-off renewable energy stations all around Europe. This disadvantage affected all types of wind power entrepreneurs. However, compared to energy distributors (who were both producers and retailers of portfolios of renewable energy sources); small private investors who only produced wind power were more vulnerable on the green electricity market. The unlevelled playing field created a green electricity market based on cheap supply by imports, which increased the pressure on green electricity prices (deteriorating economic conditions) (see figure 5.9, arrow 5). This situation caused the implementation capacity for small private investors to decrease. Simultaneously, this decrease seemed to be nullified by the emergence of a large green customer demand, which again increased the demand on the green electricity market. In addition, some (new) retailers tried to distinguish themselves (and also attract customers) by offering domestic green electricity as a special and environmentally safe product, which increased the pressure on the market even more.

The guaranteed and immediate access to the grid for decentralised producers combined with the liberalisation of the green electricity market enabled decentralised producers to serve end users themselves (figure 5.9, arrow 6). Due to these new institutional conditions, the Association

of Wind Turbine Owners in North Holland (*Vereniging van Windturbine-eigenaren in Noord Holland- VWNH*) established 'Windunie' in 2002[37]. Windunie is a cooperative made up of wind turbine owners with the aim of jointly selling their green electricity on the electricity market. Windunie is a joint venture of a distribution company in the region of Maastricht and the VNWH. Windunie strengthens the bargaining power of small private investors in comparison to that of the electricity sector. The establishment of Windunie illustrates the origination of a new social praxis (increasing the implementation capacity) because of changing institutional conditions.

We finally have to discuss the demand for clustering turbines. This institutional condition was diametrically opposed to the fact that most turbines (about 86%) that were installed by small private investors were solitary installations (Van der Knijf, 1999). Two important consequences need to be mentioned here. First, the demand for clustering forced small private investors, being landowners, to cooperate with each other (changing social conditions) in order to meet the requirements of the local land use plan. Second, the demand for clustering led to an increase in the scale of wind power projects with a corresponding increase in (pre-) investment costs[38]. The possibility of 'green financing' since 1996 alleviated this problem somewhat. Banks were able to grant loans for environmentally safe projects at interest rates that are 1 to 2 % below the market interest rate. This applied, however, to all types of entrepreneurs. The first consequence (the need for cooperation) also places large investors like energy distributors at a disadvantage because they have to deal with more landowners in the development of projects, and in addition, they often don't have any local roots. On the other hand, compared to small private landowners they are more flexible with regard to the exact location of the site and the required capital needed. Comparatively speaking, clustering is more of a disadvantage for small private investors than for energy distributors. This negative institutional condition seems, however, to be compensated for by the positive social condition, that most small private investors have a land location, something that energy distributors lack.

The four described changes in institutional and social conditions were crucial to small private investors. They seem more vulnerable on the green electricity and wind power supply market than large, wealthy investors, at least with respect to capital and the expertise needed to adapt to rapidly changing market conditions, such as the increase in competition and the increase in the scale of wind power projects. In practice, however, they were able to seize the opportunities provided by the liberalised market and to adapt to requirements set by increased competition due to knowledge and expertise building at the side of the national and regional umbrella organisations. These associations enabled for instance to close the ranks and to cooperate in the discussions between small private investors and energy distributors with regard to the interpretation of the contractual payback tariffs in view of the introduction of the REB tax (1996), the introduction of the green certificate system (2001) and the introduction of the 'Environmental quality of Electricity Production' (MEP) feed in tariffs (2003). The umbrella associations enhanced the implementation capacity of small private investors[39].

5.7 Reflection on the main findings

The chapter started with describing the performance of small private investors over the last 15 years on the basis of the following features: (1) a shift from a subordinate to a dominant position on the market, (2) a focus on solitary installations and relatively short lead times (3) a strong geographical concentration of investments in a limited number of provinces, and a shift in market shares among these provinces (4) limited employment of the joint ownership strategy. In the analyses that followed, these features were related to changing social and institutional conditions.

The inside look into the local performance of small private investors provided an explanation for the focus on solitary installations and the limited employment of the joint ownership strategy. These features can be explained by the economic rationality of small private investors: strategies of participating in a cluster or sharing ownership with other entrepreneurial groups were not in their interest and if applied, purely based on economic arguments. The inside look furthermore illustrated the importance of local capacity building. Local capacity building is a temporary self-strengthening process in which the influence of social conditions prevails. Local social relations like authority relations and relations of trust, facilitate coordinated actions, add to the scope and structure of knowledge and to the bargaining position of small private investors on the liberalising market. Social coherence at local governmental level, with the shared economic interest being the main driver, contributes to the implementation capacity of small private investors. The process of local capacity building for implementation by small private investors is not representative for all Dutch provinces over the last 15 years. Less successful developments in some provinces can also be explained by regional and local institutional regulatory and social developments, which emphasize the importance of regional and local social and institutional conditions for the developments in implementation capacity.

The additional analysis of the entrepreneurial group as a whole provided an explanation for the changing performance of this entrepreneurial group during the subsequent market periods. Institutional and social conditions were far from ideal for small private groups at the beginning of the 1990s, when small private investors found themselves in the peculiar market position of being chained to regional energy distributors. This implied a rather weak implementation capacity. Instability of government financial policy in the middle of the 1990s, combined with the continuation of impeding institutional and social conditions, caused the implementation capacity to deteriorate even more. Nevertheless, small private investors were the second most important type of entrepreneur during these years, which can only be explained by the availability of land at their disposal – a crucial positive social condition. The major institutional changes at the end of the 1990s, such as the liberalisation of the wholesale market and accompanying rules for grid connection, the greening of the fiscal system and the liberalisation of the green consumer market were very positive changes, which caused the implementation capacity to increase considerably for small private investors. At the same time, the demand for clustering was a negative institutional condition for this entrepreneurial group. This, however, seems to be nullified by positive social conditions like land ownership and cooperation in umbrella associations.

The implementation capacity for small private investors increased in comparison to that of the energy distributors. Looking at the figures 5.7 and 5.8 we observe the virtually absence of positive national institutional and social conditions in the first and second market period. In spite of this, small private investors had a leading position with regard to the number of wind power projects that was installed, which can be explained only by positive social and institutional conditions in the operational process of implementation. The third period is a different story. Looking at figure 5.9 and comparing it with figure 4.6 (same market period in chapter 4), we observe the many positive social and institutional conditions for small private investors. The broader process of liberalisation has induced this change in the configuration of national conditions. In local or regional administrative areas, where processes of local capacity building complemented these positive national conditions, implementation by this small private investors really expanded.

Finally, the analyses show that implementation capacity is a temporary capacity. Positive social and institutional conditions at a certain moment in time, with a corresponding high implementation capacity for a certain type of entrepreneur, must be comprehended as a moment, wherein not only national conditions are positive, but wherein also the required local capacities are fulfilled.

Notes

1 Parts of this chapter are taken from an article published in Energy Policy © 2004 (Agterbosch, Vermeulen & Glasbergen, 2004).

2 About 170 turbines were installed by small private investors (68%). Only 67 of these turbines (27%) were installed by the electricity sector, 54 of them in the years 1987 and 1988 (KEMA, 2002/2003; Wind Service Holland, 2002/2004).

3 In 14 out of 193 projects, objections were raised at the litigation section of the Council of State. These higher appeal procedures took on average 85 weeks (Koeslag, 2002: V).

4 The period required for authorisation is 1.5 years if each of the procedures is dealt with successively (apart from the terms required for appeal). In practice, the procedures overlap in time.

5 In 1991, the Governmental Agreement on Planning Problems Wind Energy was agreed on between the Ministry of Economic Affairs, the ministry of Housing, Spatial Planning and the Environment and seven coastal wind abundant provinces (chapter 3, section 3.7.2).

6 All research units were wind power projects realised in the period 1992 to 2002 consisting of 1 or more turbines and owned and exploited by farmers.

7 As reported in the background document: Agterbosch, S. (2003) 'The operational process of wind power implementation in Zeewolde'. Case study 2: 'Solitary installation by small private investors. The importance of social and institutional conditions.

8 Flevoland is the youngest Dutch province, established on January 1 1986, situated in the Western part of the Netherlands. The whole provincial territory has been reclaimed from the sea in the period 1930s – 1960s. The region consists of six municipalities: Almere, Dronten, Lelystad, Noordoostpolder, Urk, and Zeewolde.

9 The peak in 1995 is a national phenomenon, caused by the anticipated switchover from the subsidy to the fiscal system.

10 This turbine was popular amongst farmers and was known therefore as the 'farmer-windmill'.

11 This quotation comes from farmers owning windmills in a nearby municipality. These farmers constitute a collective of in total 7 farmers. Together, they own a line-up of 7 wind turbines, which have been operative since December 1999 (PDE, 2004).

12 The 'Association of Wind Turbine Owners in the IJsselmeer area' (VWIJ) and the regional department of the 'Dutch Organization for Agriculture and Horticulture' (LTO).

13 From a landscape point of view, the solitary turbines form a whole. However, applications were submitted for every turbine separately. Legally, the turbines were separate projects.

14 This study was executed by TNO. TNO is a scientific service provider. Companies, governments, and organisations use TNO's services: contract research, consultancy, policy studies, tests and approvals.

15 The Decree became applicable for wind power projects up to 15 MW, with a distance to the nearest dwelling of at least 4 times the mast height.

16 Matthijse, D.J. (Civil servant municipality Zeewolde) Personal communication 27 March 2002, Keestra, (Civil servant Province of Flevoland) Personal communication 26 January 2004.

17 One of these farmer representatives was member of the board of the regional association of wind turbine owners and had been involved personally in the deliberations with the municipality, the province and the Dutch Network Broadcasting Station regarding the formation of WAP. Another farmer representative was at the same time deputy mayor. Consequently, communication lines to the municipal authorities were short.

18 VWIJ is a member of the national association PAWEX -'Private Wind Turbines Operators', which represents private parties in the Dutch wind energy sector on a national level.

19 Such short lead times were partly enabled by the availability of the PIEMD-registration for solitary turbines since 2001. This institutional condition saved time compared to the Environmental Permit (see appendix 3.4).

20 De Wolff Nederland Windenergie BV and Groenraedt BV.

21 Up to November 2003, 206 solitary turbines (185 MW) were installed (or in procedure) by farmers in Zeewolde. De Wolff Nederland Windenergie BV and Groenraedt BV have been associated with the implementation of 106 of these turbines.

22 Middelkamp, J. (Farmer and wind turbine owner) Personal communication, 5 November 2003.

23 Whereas Bureau Windmills I both had a policy formation and a policy implementation task, the task of Bureau Windmills II has been limited to the implementation of WAP solely. Three persons, one full- and two part-timers still work on this job (November, 2003).

24 More than 50% of all turbines installed in the Netherlands up to 1995 were solitary installations in Friesland.

25 Ter Horst, W. (Senior civil servant province Groningen) Personal communication, 2 December 2004.

26 Kortenoever, M. (Representative PAWEX) Personal communication 03 March 2005.

27 Website Wind Service Holland http//: home.wxs.nl~windsh/windsteun.html viewed at 16 November 2004.

28 The pay-back tariff was 7.5 €/ct for projects below 2 MW realised in 1995 and 1996. The tariff consisted of an avoided costs component, the MAP-levy and Ecotax (WSH, 2004).

29 Ministry of Economic Affairs, http://www.ez.nl/content.jsp?objectid=13248, viewed at 16 November 2005

30 Questions were asked in Dutch Parliament about the transfer of the REB tax to private producers. From the answers of the Minister of Economic Affairs follows that the ministry was aware of the situation that lack in clarity about the interpretation of the contractual payback tariffs in view of the Environmental Tax Act would probably lead to lawsuits (Tweede Kamer der Staten Generaal, Vergaderjaar 1995-1996a, Vergaderjaar 1995-1996b).

31 Based on judgments: LJN: 7706, Rechtbank Zwolle, 55827/HA ZA 00-432 and LJN: AA5317, Rechtbank Middelburg, 645/1998 and Kortenoever, M. (Representative PAWEX) Personal communication 03 March 2005

32 Hempenius, Y (Member of the Board of the Association of Wind Turbine Owners in Friesland) Personal communication 26 January 2005

33 Littel, A. (Senior Policy Advisor, Ministry of Housing, Spatial Planning and the Environment) Personal communication 7 May 2002; Bosch, G. (Consultant in the field of renewables) Email communication, 21 November 2002

34 Kortenoever, M. (Representative PAWEX) Personal communication 03 March 2005, Hempenius, Y (Member of the Board of the Association of Wind Turbine Owners in Friesland) Personal communication 26 January 2005

35 Based on judgment LJN: AB2747, Rechtbank Utrecht, 132389/KGZA 01-669/BA and (Tweede Kamer der Staten Generaal, Vergaderjaar 2000-2001, 25097, nr.47).

36 The negotiations with the energy distributor REMU in the province of Utrecht were an exemption and successfully led to a revision of the payback contracts.

37 Windunie represents the owners of approximately 300 MW of wind power; most of them wind cooperatives and small private investors.

38 Turbine costs amount to about 70 to 80% of total investment costs. Therefore, an increase in the number of turbines brings with it a relatively sharp increase in total investment costs (Beurskens and Jansen, 1998).

39 The Association of Wind Turbine Owners in North Holland stepped out PAWEX and joined NEWIN in 2002 (see also Chapter 3 section 3.3.3). Dissension about the establishment of Windunie and doubts about the board of directors caused this cancellation from membership of PAWEX.

6 Wind cooperatives

6.1 Introduction[1]

This chapter deals with the performance of wind cooperatives. Comparing wind cooperatives with small private investors and energy distributors, based on the total capacity installed over the last 15 years, one comes to the conclusion that wind cooperatives have been of minor importance. The highest market share (16% in 1994) was in fact a clear exception, and in most years, their market share was less than 5%.

We will show that this inferior position on the market coheres with some exceptional organisational characteristics. Wind power exploitation is not a way to make money for this entrepreneurial group, but a way to promote a sustainable society based on renewable energy sources. This idealistic background, just as the voluntary character of the organisations, influenced their behaviour in each of the three market periods and clearly distinguished this group of investors.

All 25 Dutch wind cooperatives were founded during a relatively short period, from 1986 to 1992. By now, 11 of these have been disbanded or have merged. The majority of the cooperatives that continued to exist are small organisations with only a limited number of turbines. We will show that the few cooperatives that performed better changed of character: they chose to professionalise to a more or lesser degree.

In addressing this exceptional entrepreneurial group and its market performance, special attention is paid to community ownership in some other countries. We will see that Dutch wind cooperatives deviate from cooperative arrangements in Denmark and Germany, i.e. countries in which community ownership has played a major role in the successful development of wind power.

6.2 Cooperative arrangements

Cooperatives are not unique for the field of electricity production. We notice various forms of cooperative arrangements at different fields of activity. Cooperatives can be defined as collaborative efforts directed at supplying and selling a product at the members' costs and risks. The members occupy an important position in the cooperative. They set out the line of policy and they originally provided for the financing of the organisation. This section summarises the history of cooperative arrangements in general, in order to indicate to which type of cooperative arrangement the Dutch wind cooperatives belong.

The first cooperative arrangements came into being halfway the 19th century. These cooperative arrangements principally were credit providers (Engelaar, 2000 in Loenen van, 2003). In the course of the 20th century cooperatives became active in other areas of work, such as the

agricultural producing, processing and service industries. Individual market shares were negligible in agriculture, where sales markets are neither transparent nor readily accessible. By joining forces, individual farmers were able to strengthen their market position. They were able to enhance that position through the enlargement of the scale of cooperation (Glasbergen, 2000: 244-245). These agricultural cooperatives developed into large organisations able to compete with large private companies. The principal aim was to improve the economic position of the individual members.

It would take until the 1980s before new types of cooperative arrangements came into existence: environmental cooperatives and food cooperatives. These new variants still sought to generate sources of income, but the motivation went beyond monetary benefits. Members shared an idealistic motive. They recognized a common interest in producing environmental quality for pay.

Environmental cooperatives emanated from the agricultural sector in response to the increasing environmental pollution caused by that sector and to the burden of environmental rules that eroded the economic position of farmers. The notion of the environmental cooperative was grounded in the idea that a market should be created for environmental pursuits. Slightly more than 2% of all agricultural enterprises were involved in these small organisations, with a membership of 25 to 200 farmers (Glasbergen, 2000: 245-246).

Food cooperatives eventually were pure idealistic organisations. They bought organic products from wholesalers in order to sell these products against cost price to the members. Members did not emanate from the agricultural sector and did not seek to generate sources of income. Whereas a professional staff managed the large agricultural cooperatives, volunteers principally managed the smaller environmental and food cooperatives.

Three types of cooperative arrangements can be derived from this short historical description.

1. Sector bounded large-scale cooperatives with a pure economic objective; these cooperatives aim at generating sources of income by increasing the productivity from the sector and are managed by a professional staff,
2. Sector- or not sector bounded small-scale cooperatives with a hybrid objective; these cooperatives aim at generating sources of income by supplying and selling high-quality and environmentally friendly products and are principally managed by volunteers; although they sometimes work with a professional staff,
3. Not sector bounded small-scale cooperatives with an ideological objective; these cooperatives aim at supplying and selling high quality and environmentally friendly products and are managed by volunteering citizens.

For the first and second types of cooperative arrangements, economic incentives are the main driving force behind investment decisions. The third type of cooperative arrangement deviates on this aspect. For this type, idealistic incentives, such as environmental considerations, are the decisive input to investment decisions. The Dutch wind cooperatives belong to this third and most recent type of cooperative arrangement, as we will see in the next section.

6.3 Characteristics of Dutch wind cooperatives

The Dutch wind cooperatives are organisations in which citizens have a common interest in producing and selling wind power on the electricity market. The following characteristics describe these organisations:

1. they have a strong idealistic background; ideological incentives are the main driving force behind activities,
2. they are locally or regionally oriented organisations,
3. the members are citizens with no professional connection to the electricity sector,
4. the members serve to generate social support and they originally provided for the financing of the organisation,
5. the organisations are managed by volunteers, although some work with a paid staff,
6. and there exists a rather closed collaborative approach among the cooperatives.

The first feature of the Dutch wind cooperative is the idealistic background. The origin of the Dutch wind cooperatives is strongly linked to the Dutch Organisation for Renewable Energy (*Organisatie voor Duurzame Energie- ODE*) (see section 3.3.3). In the 1980s, workers from ODE visited all kinds of local groups, including environmental protest groups, to explain and promote the concept of wind cooperatives. ODE focused its attention on the coastal areas because the

Figure 6.1 Location of wind cooperatives that were in operation in the Netherlands in 2004.

efficiency of wind turbines in the inland section of the country was insufficient in those days. As a result, 25 cooperatives were established, during a relatively short period from 1986 to 1992, especially in what are known as 'wind-abundant areas'. In the meantime, 11 of the wind cooperatives have been disbanded or have merged (see appendix 6.1). Most of these mergers have taken place between small cooperatives from the same region, which experienced problems due to a lack of human capacity. Figure 6.1 provides an overview of the location of wind cooperatives that continued to exist in 2004.

The founders of the cooperatives objected to nuclear power and wanted to offer an alternative. This idealistic background clearly distinguishes this type of entrepreneur. The main interest is not to make money by wind power exploitation, but to promote a sustainable society based on renewable sources. Cooperatives try to achieve this aim, by developing wind projects based on strong local support and public participation. For some cooperatives (ZEK and Noord Brabant), the main purpose was (and is) to demonstrate the feasibility of wind power exploitation in their region

In addition to developing wind power projects, most cooperatives also developed other activities – such as providing information and lobbying, and supporting the application of other forms of renewable energy- to a greater or lesser degree at the local or regional level[2]. They inform the local population and politics through demonstrations and fairs, lectures at schools, newsletters and websites. The information is not restricted to wind energy, but encompasses renewable energy in general. Cooperatives perceive that these information activities are highly appreciated, just as the opportunity for citizens to participate in their projects. Various interviewees explicitly advanced the perception that citizens value wind cooperatives more positively compared to other types of wind power entrepreneurs.

Eleven cooperatives lobby to influence local and regional policy making on wind energy, i.e. the adoption of wind energy in the municipal and regional land use plan. Although three wind cooperatives actually have contributed to a local memorandum on wind energy, most wind cooperatives have experienced problems due to unwillingness at the side of local authorities. '*Project development fails because the local authorities refuse to cooperate in planning*[3]'. Lobbying at the national level is left to the umbrella association ODE and the cooperatives Kennemerwind and Windvogels. This national wind lobby, however, never lived up to its promise, as we will show in the sections 6.5-6.7.

Several wind cooperatives have used the proceeds of the sale of wind electricity to support financially unfeasible projects. More than half of the wind cooperatives have occupied themselves one way or another with the application of other forms of renewable energy. Cooperative Deltawind donated almost € 20.000 to a local primary school to install solar panels and another € 85.000 to a local school to install a heat pump[4]. Cooperative Zeeuwind subsidised its members to purchase solar panels and it financially participated[5] in the project 'Sun at School' of the provincial platform for sustainable development[6]. This platform enabled the installation of solar panels on 90 primary schools in the province of Zeeland (Phernambusq, 2002). All these projects serve as demonstration and education programmes and aim to generate public support for sustainable energy.

A second feature of the Dutch wind cooperative is the local or regional orientation in wind power generation. At the end of the 1980s, wind cooperatives mutually agreed on the working area of each cooperative so no competition could occur: investments are restricted to the locality of the organisations[7]. In addition, two wind cooperatives apply a strict residence requirement for membership[8]. Although the other 12 cooperatives do not apply such a residence requirement, in practise most of their members are citizens of the region where the cooperative is located.

Third, in 2002 cooperatives together had 5879 members (figure 6.2) (Loenen van, 2003: 24). This means that 0.05% of the Dutch population owns a stake in a wind cooperative. Members are citizens with no professional connection to the electricity sector. Among the members are municipalities, schools, local departments of political parties and (environmental) associations, but the far majority consists of individuals with idealistic motives.

In the beginning years, members were willing to accept a below market return or no return at all in order to support the cooperative: *'We did not know whether wind power exploitation was financially feasible when we started and we did not expect to earn a profit (Loenen van, 2003: 23)'*. Although at present, members receive an annual dividend, which is way above market level[9], nearly all of them reinvest their dividends.

In general, cooperatives actively recruit members only at the moment that new turbines are installed. Considering that the majority of cooperatives have not realised any projects since 1995, memberships figure stagnated or declined since that year. Three of the four largest wind cooperatives are exceptions: membership figures of Zeeuwind, Deltawind, and Kennemerwind kept on growing[10]. These large cooperatives are also the cooperatives that were most successful in terms of the number of turbines installed (see also figures 6.5 and 6.6).

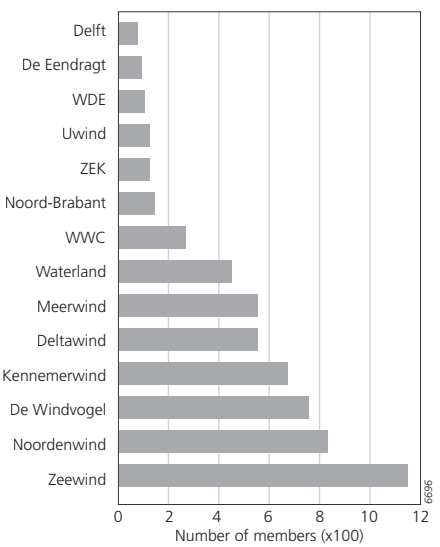


Figure 6.2 Membership figures of Dutch wind cooperatives in 2002 (Loenen van, 2003: 24).

The fourth characteristic is that wind cooperative originally raised all of their capital from the members. This financing strategy changed in the course of the years. Since halfway the 1990s they also use mortgages and the proceeds of the sales of wind electricity to finance their activities. Members do not serve any longer to raise finances for new projects, but primary to generate social support. However, the far majority of wind cooperatives did not establish new projects since 1995. These cooperatives consider members' investments as a 15-year loan, which is to be repaid with interest. Some of these cooperatives employ a maximum investment-sum for new members to prevent that these members become a financial burden. *'At the moment, we provide an annual dividend of 5% and receive an annual dividend of 3% of the bank. We make a loss if we cannot immediately use the investments for a new project(Loenen van, 2003: 22)'.* Delft is the only cooperative that chose to leave the profits of a project in that particular project, i.e. the members of this cooperative fully receive the financial return of the turbine. This cooperative put a halt to the recruitment of new members until the moment that new turbines will be installed. Kennemerwind and Deltawind on the other hand explicitly aim for an increase in members: '*Increasing social support is so important to us, that we don't care that members are a financial burden*[11].

The fifth characteristic of the Dutch wind cooperative is the voluntary and amateurish character. The active members who put much effort into the cooperative in the early years are still the backbone of the organisation today. Rejuvenation of active members, or membership in general, hardly occurred.

The dependence on volunteers impeded the operational process of wind power implementation for half of the cooperatives. For three of them[12], a lack in human capacity even prevented them from project development at all. Their governing board consists of members who work fulltime, having little time left to devote to the cooperative. *´We have big plans, but not enough people to realise them (Loenen van, 2003: 44)'.* Moreover, the scope and structure of knowledge at the side of these volunteers is usually limited, which is in view of the complexity of procedures and the rather dynamic electricity market a relative disadvantage.

The other half of the cooperatives experienced fewer problems with attracting sufficient human capacity. Four of them have decided to professionalize, and now work with a paid staff[13]. '*We have decided to engage people in an early stage to guarantee continuity in labour. Project development needs unbroken attention, which volunteers can insufficiently deliver*[14]'. These four cooperatives own a share of 62% of the turbines and a share of 80% of the capacity ever installed by this entrepreneurial group (see later figures 6.5 and 6.6).

The final characteristic is the collaborative approach among the Dutch cooperatives. Communication lines between the Dutch wind cooperatives are short. Wind cooperatives meet four times each year at the umbrella association ODE. At these meetings, they discuss wind power developments in the Netherlands and abroad, as well as problems they encounter in the operational process of wind power implementation. The meetings contribute to knowledge and expertise building at the side of the cooperatives. Eight of them never miss these meetings[15]. Three cooperatives attend at an irregular base[16]. They are unable to attend every meeting due to a lack in human capacity. Three cooperatives do not see the use of the meetings and never attend[17]. Besides these meetings, some wind cooperatives maintain telephonic or written contact on a bilateral and very irregular base. Personal features and actual developments in ongoing projects drive these contacts. By means of their websites and newsletters, they also inform their fellow cooperatives.

6.4 Market performance of Dutch wind cooperatives

As we have seen, wind cooperatives are an exceptional type of investor on the Dutch wind power market. Managed by volunteers and with ideological incentives being the main driving force behind investments, the question arises how these investors have performed on the market.

6.4.1 Market performance in figures

The performance in terms of capacity realised in the different Dutch provinces over the last 15 years can be described based on the following features:

1. a continuous minor position on the market,
2. a strong decrease in the number of projects and a decrease in solitary installations,
3. moderate but increasing lead times of the projects,
4. a geographical concentration of investments in the coastal provinces,
5. a strong concentration in ownership of wind power capacity within this entrepreneurial group,
6. a limited employment of the joint ownership strategy with other entrepreneurial groups.

The first feature, the position on the wind power market, has been described in chapter 3 (see figures 3.1, 3.2 and 3.3). Wind cooperatives have been of minor importance as far as the statistics on the number of projects, turbines, and total capacity installed are concerned. The annual contribution fluctuated between 0% and 5% over the last 15 years with some exceptional peaks in the years 1994, 1996 and 2000, when they respectively realised 16%, 11% and 9% of total capacity installed.

The second feature of the performance of this entrepreneurial group is the strong decrease in the number of projects and the decrease in solitary installations (see table 6.1). The absolute majority of the projects have been installed in the first market period (78%). As the number of projects strongly decreased, the average number of turbines per project increased in the course of the years. The dominant position of solitary installations disappeared. Also the average capacity installed per project increased considerably, which is a combined consequence of the increase in the average number of turbines per project and technological progress.

Table 6.1 Project characteristics of projects realised by wind cooperatives

Size of project	1989-1995		1996-1997		1998-2004	
	Number	%	Number	%	Number	%
Solitary	39	81.3	4	57.1	3	42.9
2 or 3 turbines	6	12.5	1	14.3	3	42.9
4 or 5 turbines	1	2.1	1	14.3	0	0
6 to10 turbines	0	0	1	14.3	1	14.3
11 and above	2	4.2	0	0	0	0
Average number of projects per year	6.9		3.5		1	
Average number of turbines per project	1.3		2.3		2.1	
Average capacity per project (MW)	0.2		0.8		2.3	

The third feature of the performance of this entrepreneurial group is the moderate but increasing lead-times of the projects. We conducted a survey among the 14 Dutch wind cooperatives with regard to projects realised in the period 1989 up to 2004[18]. The survey showed that the average lead-time required for the authorisation of the projects was 41 months[19]. This is the time required for authorisation including the time required for informal deliberations and terms for appeal. None of the projects was completed within 1 year, 25% of the projects were completed within 2 years and only 50% were completed within 3 years. Formally, planning and licensing takes 18 to 24 months[20], which implicates that on average 17 to 23 months were required for informal deliberation, handling of formal protests and construction. The projects with the longer lead times were mainly realised in the third market period. These projects varied in size: among these projects were two solitary installations, one project of two turbines, one project of three turbines and a project of six turbines. Cooperatives are in between energy distributors and small private investors with regard to the average lead-times.

The fourth feature of the performance of this entrepreneurial group is the geographical concentration of investments in the coastal provinces (see figures 6.1. 6.3 and 6.4). Up to 1995, the provinces of Friesland, Noord Holland and Zeeland were frontrunners with a 30% market share each. The other coastal provinces, Groningen and Zuid Holland followed at distance. These

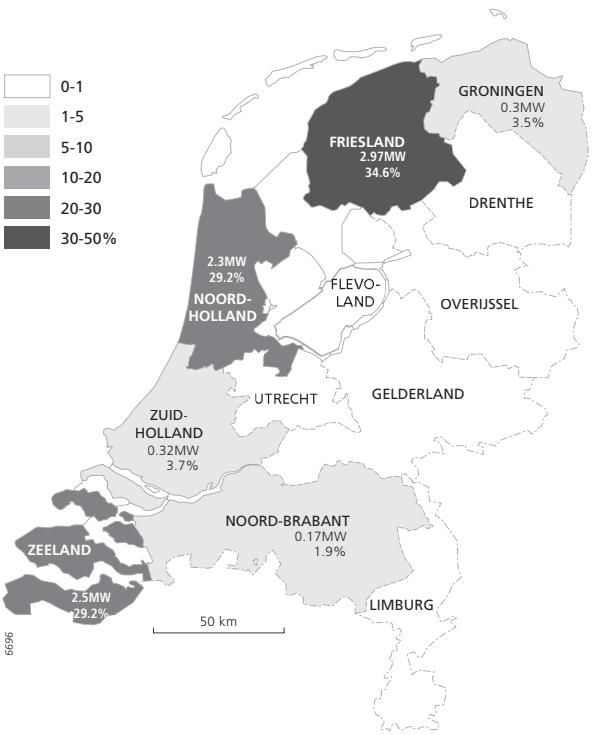


Figure 6.3 Geographical concentration of wind power capacity installed by wind cooperatives (1989-1995).

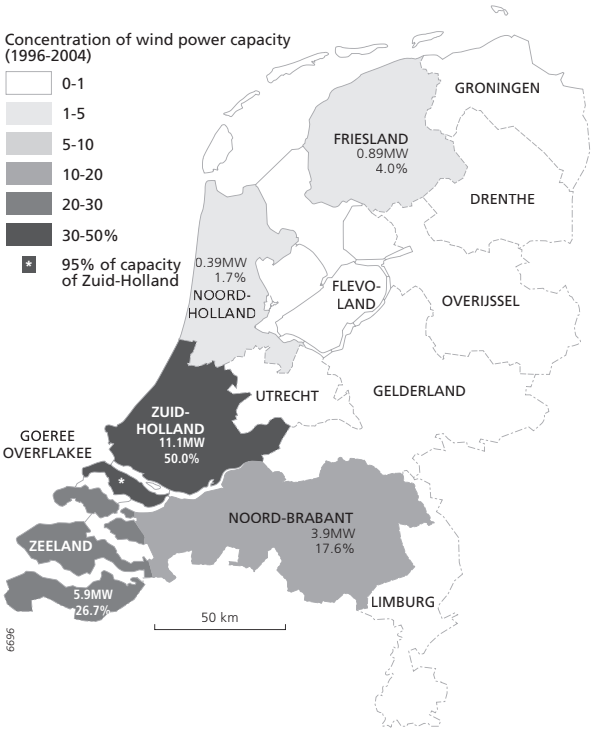


Figure 6.4 Geographical concentration of wind power capacity installed by wind cooperatives (1996-2004).

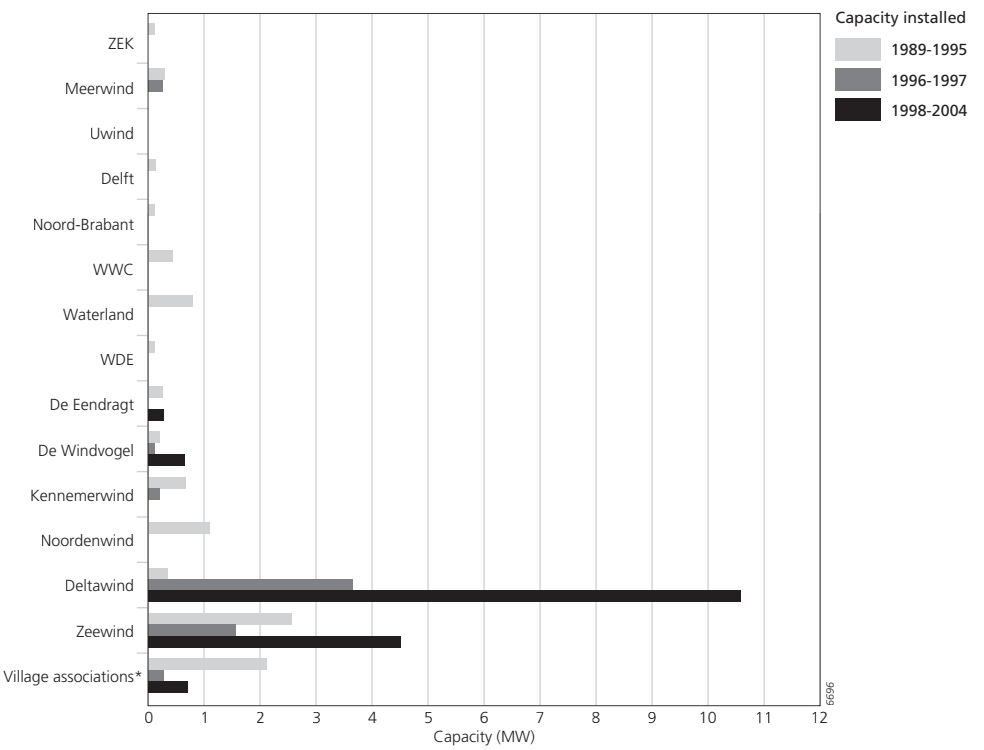
positions changed over the years. The role of the province of Zuid Holland grew with a 50% market share of total capacity realised by this entrepreneurial group since 1995. Developments in Noord Holland and Friesland went in the opposite direction, with each less than a 5% market share of total capacity realised by this entrepreneurial group since 1995. Zeeland retained its market position.

The fifth feature is the concentration of ownership within this entrepreneurial group. Currently, two of the 14 wind cooperatives own 75% of the wind power capacity and ever installed by this type of wind power entrepreneur. These two wind cooperatives are Deltawind and Zeeuwind (see figure 6.5). The dominance of the cooperatives Deltawind and Zeeuwind is less pronounced in terms of the number of turbines that was installed. The number of turbines installed by Noordenwind and Kennemerwind are of the same magnitude (see figure 6.6).

The final feature is the limited employment of the joint ownership strategy with other types of entrepreneurs, at least in terms of the number of projects realised. Over the last 15 years, only four out of 93 projects realised by cooperatives (4.3%) have been realised in joint ownership with other types of entrepreneurs (see appendix 6.2). In terms of the total capacity that was installed in joint ownership, this figure is quite different. Due to the implementation of two large wind power

projects in 2003 and 2004, the relative importance of the joint ownership strategy increased. As of those years, 13.8 MW or 44.5% of total capacity installed by wind cooperatives has been realised in joint ownership with other types of entrepreneurs.

Looking at these features and comparing them with the market performance of small private investors and energy distributors (chapters 4 and 5), we observe both some similarities and differences. All three entrepreneurial groups show a geographical concentration in investments in the coastal provinces. Looking at the average project scale and the average lead-times, we observe that cooperatives are in between energy distributors and small private investors. Conversely, they do not occupy an intermediate position in terms of the number of projects and capacity installed. The limited number of projects and capacity installed, notwithstanding the moderate lead-times, are in fact the most striking features of the performance of wind cooperatives as a group. However, the organisational characteristics and the market performance show that we may distinguish different subgroups. The first group encompasses the 11 wind cooperatives, which have disbanded or have merged. The second group encompasses the wind cooperatives, which continued to exist, but those are moderate in size and own just a limited number of turbines. The third group encompasses the four larger cooperatives who have more or less professionalised



* Several communities of locality or village associations in the province of Friesland implemented wind turbines in order to stimulate the use of renewable energy sources, simultaneously generating financial resources for social and cultural activities in their villages

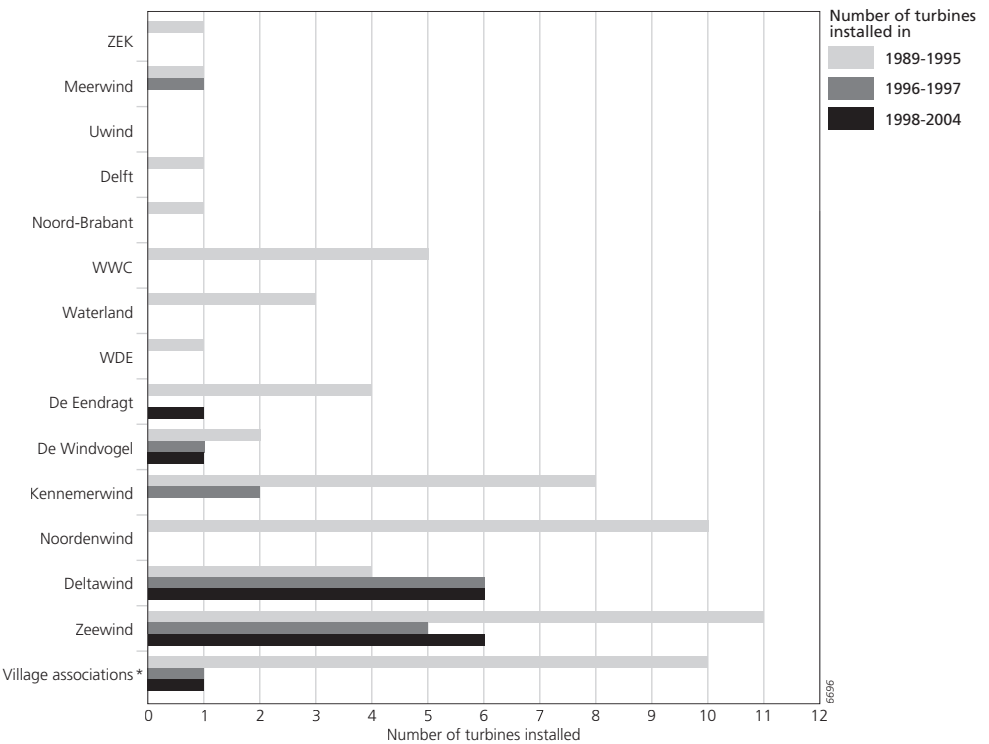
Figure 6.5 Capacity installed by wind cooperatives in the Netherlands

and who have established the majority of turbines installed by this group. These cooperatives are Kennemerwind, Noordenwind, Deltawind and Zeeuwind (see figures 6.5 and 6.6).

This chapter serves to explore to what extent the features of the performance of cooperatives can be explained by changing social and institutional conditions, such as changing legislation, changing financial incentive schemes, organisational features and strategies chosen by wind cooperatives and other stakeholders involved in implementation. The former chapters illustrated the importance of regional and local social and institutional conditions for the implementation capacity for energy distributors and small private investors. The question arises how the implementation capacity of wind cooperatives has been affected by these local and regional institutional regulatory and social conditions. To answer this question, problems in planning and licensing of projects as experienced by wind cooperatives have been analysed in a survey among 14 wind cooperatives in the Netherlands.

6.4.2 The operational process of implementation

Figure 6.7 shows the results of the survey, presenting procedural and societal bottlenecks as experienced by wind cooperatives[23]. These bottlenecks can be divided in four different clusters of social and institutional conditions.



* Several communities of locality or village associations in the province of Friesland implemented wind turbines in order to stimulate the use of renewable energy sources, simultaneously generating financial resources for social and cultural activities in their villages[21]

Figure 6.6 Number of turbines installed by wind cooperatives in the Netherlands[22]

The institutional regulatory dimension and the social context were not problematic in the majority (70-90%) of the projects (see the four clusters in figure 6.7). Nevertheless, some specific conditions, such as the knowledge base and attitude of local civil servants and especially social resistance by citizens were problematic in 20% to 35% of the projects. These results correspond to the on average moderate, but broad range in lead-times that characterised the projects.

Comparing figure 6.7 with figure 5.4 (bottlenecks in planning and permitting as experienced by small private investors) we observe a remarkable difference. Social resistance by citizens was virtually absent in the projects realised by small private investors. Simultaneously social resistance was problematic in 35% of the projects realised by wind cooperatives. Despite the explicit idealistic background and the strategy of developing projects based on strong local support and public participation, wind cooperatives experienced more problems with social resistance than small private investors did.

Looking at the problems experienced in the operational process of implementation, we notice that in general cooperatives were in between small private investors and energy distributors. This corresponds to the average project scale and the average lead-times. Also on these aspects, cooperatives -as a group- occupied an intermediate position. However, based on the organisational characteristics and the market performance we distinguished three subgroups (section 6.4.1), which performed differently over the years. In the next sections, we shift to a combined regional and national perspective to analyse the performance of these subgroups. Here we analyse the relative importance of the organisational characteristics in view of changing social and institutional conditions, such as changing legislation and changing financial incentive

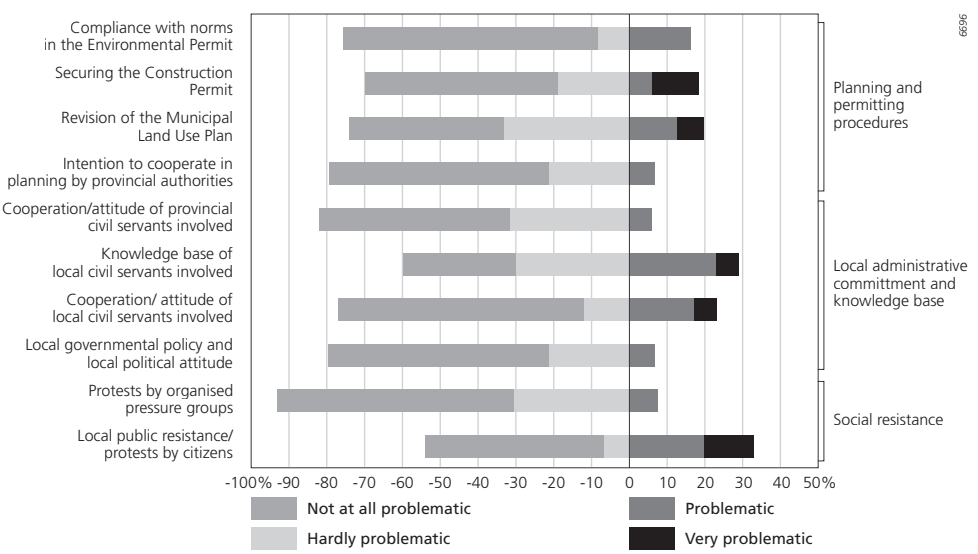


Figure 6.7 Bottlenecks in planning and permitting as experienced by wind cooperatives (period 1989-2004/N=20).

schemes. We will focus on how the three subgroups have reacted upon changes in social and institutional conditions in each of the three market periods.

6.5 Monopoly powers (1989-1995)

We saw that two third of the turbines ever installed by wind cooperatives was already installed in this first market period. This is remarkable, knowing that institutional conditions during this period were very much to their disadvantage, with cooperatives finding themselves in the same peculiar position as described for small private investors in chapter 5. They were dependent on the regional energy distributor for the payback tariffs, which consisted of an avoided cost component (SAR) and the MAP-levy. Although the payback tariffs differed per energy distributor, they in general were low. Even more remarkable is that the umbrella association ODE hardly occupied itself directly with national policymaking or improvement of payback tariffs. The national lobby and negotiations with the Federation of Energy Distributors in the Netherlands (EnergieNed) were left to the Union of Private Wind Turbine Operators (*Particuliere Wind Turbine Exploitanten -PAWEX*)[24] (see also section 5.5).

Looking at the total configuration of national institutional and social conditions, the same conclusion must be drawn as was for small private investors during this period: that of a rather weak implementation capacity (see figure 6.8, arrow 1). This conclusion seems at odds with the fact that it was precisely during this period that cooperatives put into place most of the turbines they would ever implement.

How can we explain this? First, cooperatives did not follow the same rationality as the other types of entrepreneurs. They did not intend to make money out of their wind projects, and therefore, they were less concerned about hampering financial conditions. Their idealistic background made them rather insensible to low profits or even to no profits at all. Cooperatives were a new phenomenon in the Netherlands, and they were youthful associations with enthusiastic volunteers. The expansion in membership that took place between 1986 and 1995 applies to all cooperatives. Research into cooperative associations shows a correlation between increase in membership and dedication or level of activities undertaken by members (Meadowcroft, 2002). This period of membership growth, combined with idealistic tendencies, constituted a social context that seemed to nullify other impeding conditions in a certain sense (figure 6.8, number 2).

In addition, impeding national social and institutional conditions were nullified by bilateral agreements between some wind cooperatives and their regional energy distributor. A few energy distributors were willing to pay a rather attractive compensation per kWh produced by the regional wind cooperatives. These favourable agreements resulted as a rule from specific regional or local social conditions, such as short communication lines and the accidental enthusiasm of employees with sufficient high positions within the regional energy distributor. These positive local social conditions turned out to be the basis for success of the third subgroup of cooperatives, who would establish the majority of the turbines (figure 6.8, number 3).

A first important breakthrough was the increase of the payback tariff by the regional energy distributor in the province of Friesland in 1990 (Wind Service Holland, 2004). The cooperative Noordenwind was able to take advantage of this favourable payback tariff and of the

circumstance that most municipalities in this province were helpful in planning at the beginning of the 1990s (see also chapter 5, section 5.4). '*We implemented all our turbines between 1989 and 1995. Implementation went rather easy. Municipalities cooperated in planning and there were no opponents. Lead times were 1 to 2 years*[25]'.

A second example of positive local social conditions concerned the cooperative Deltawind. The director of the regional energy distributor on the island Goeree Overflakkee in the province of Zuid Holland was at the same time president of this cooperative. A very favourable payback agreement emanated from the negotiations for the first wind turbines of Deltawind in 1990 and 1993. '*Successors of that director must have wondered about the terms of that agreement. However, these successors came from outside the island, at a time that the regional energy distributor was already taken over by Eneco*'[26].

A third example applied to the wind cooperative Zeeuwind, which received a very favourable compensation per kWh. The energy distributor in the province of Zeeland paid 100% of the consumer price for a maximum of 750 kWh per member of this cooperative. This rule additionally stimulated Zeeuwind to recruit new members, and it nowadays is the largest wind cooperative by far (see figure 6.2).

A final example concerned the energy distributor PEN in the province of Noord Holland. PEN allowed the cooperative Kennemerwind to establish wind turbines in a wind power plant originally built and exploited by PEN. It moreover adopted a very favourable payback tariff for cooperatively owned wind turbines (almost double the payback tariffs for private producers).

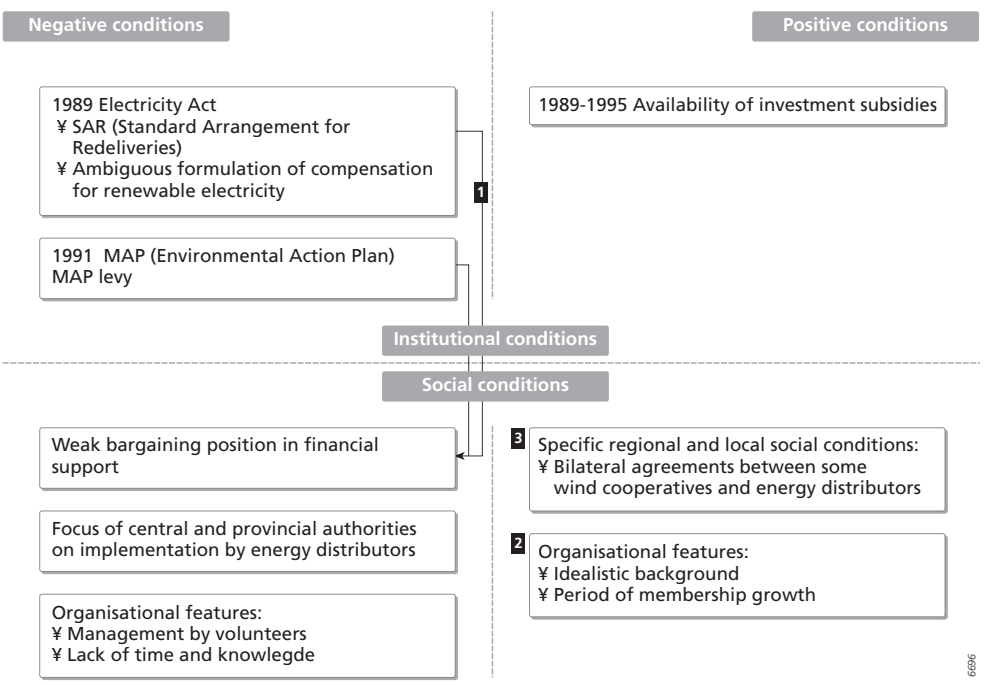


Figure 6.8 Constituent conditions of the implementation capacity for cooperatives in the Monopoly powers (1989-1995)

Due to this favourable payback tariff and an investment subsidy of 35%, returns were about 28% during the first 5 or 6 years of the existence of Kennemerwind[27].

These examples of positive regional and local social conditions correlate to the locality of the four cooperatives, which performed best in terms of the number of turbines installed. Therewith, the examples illustrate the importance of regional and local conditions for the implementation capacity of a particular cooperative. Differences in these regional and local conditions laid the foundation of the tri-partition in different subgroups.

At the end of this period, at a moment when all the other types of entrepreneurs peaked (1995), cooperatives did not. This seems amazing considering the fact that they had to deal with exactly the same shift to the new fiscal system. Social conditions – namely, some of the characteristics specific to cooperatives – can clarify this. Cooperatives had to keep their operations running on a volunteer basis. Lack of time and knowledge (volunteers often also had full-time jobs) made it more difficult to lobby and to increase pressure on local permit-issuing authorities. Another explanatory factor is that some cooperatives, after having installed their first wind turbines, did not start any new wind power projects.

6.6 Interbellum (1996-1997)

Non-profit organisations, like cooperatives, were unable to make full use of the fiscal arrangements that were gradually introduced in this transitionally period. The switch in governmental financial incentive system (from a subsidy to a fiscal system) deteriorated the competitiveness of cooperatives on the wind power market[28]. In addition, the unfavourable national institutional conditions (SAR and MAP) of the previous period still existed (see figure 6.9, arrow 1). These conditions resulted in a weakening of implementation capacity. Only five cooperatives established turbines in this period, and the total number of projects installed by wind cooperatives halved. The division in different subgroups, which had its origin in the former period, perpetuated. Three of the four successful wind cooperatives, which performed well in the first market period, established more than 80% of the turbines installed by wind cooperatives in this second period. The exception was the cooperative Noordenwind. Noordenwind performed well in the first, but not in this second market period. Regional institutional regulatory and social developments in the province of Friesland, which is the working area of Noordenwind, explain this reversal in performance. Halfway the 1990s, an increase in social resistance affected the operational process of policy making in this province. Municipalities became less inclined to cooperate in planning. Moreover, administrative discussions within the provincial authorities indicated a new policy direction, which would make the installation of new solitary turbines impossible (see also chapter 5, section 5.4).

The gradual introduction of fiscal instruments led to a change in funding strategy (figure 6.9, arrow 2). Originally, cooperatives had raised all of the capital from their members, but now they started to consider bank loans. The introduction of the EIA-scheme, the Vamil-scheme and Green Funds made it far more attractive to take out a mortgage. Dutch banks were looking for green projects to invest their Green Funds and cooperatives were able to take advantage of the EIA-scheme and the Vamil-scheme by means of a 'sale and lease back' construction.

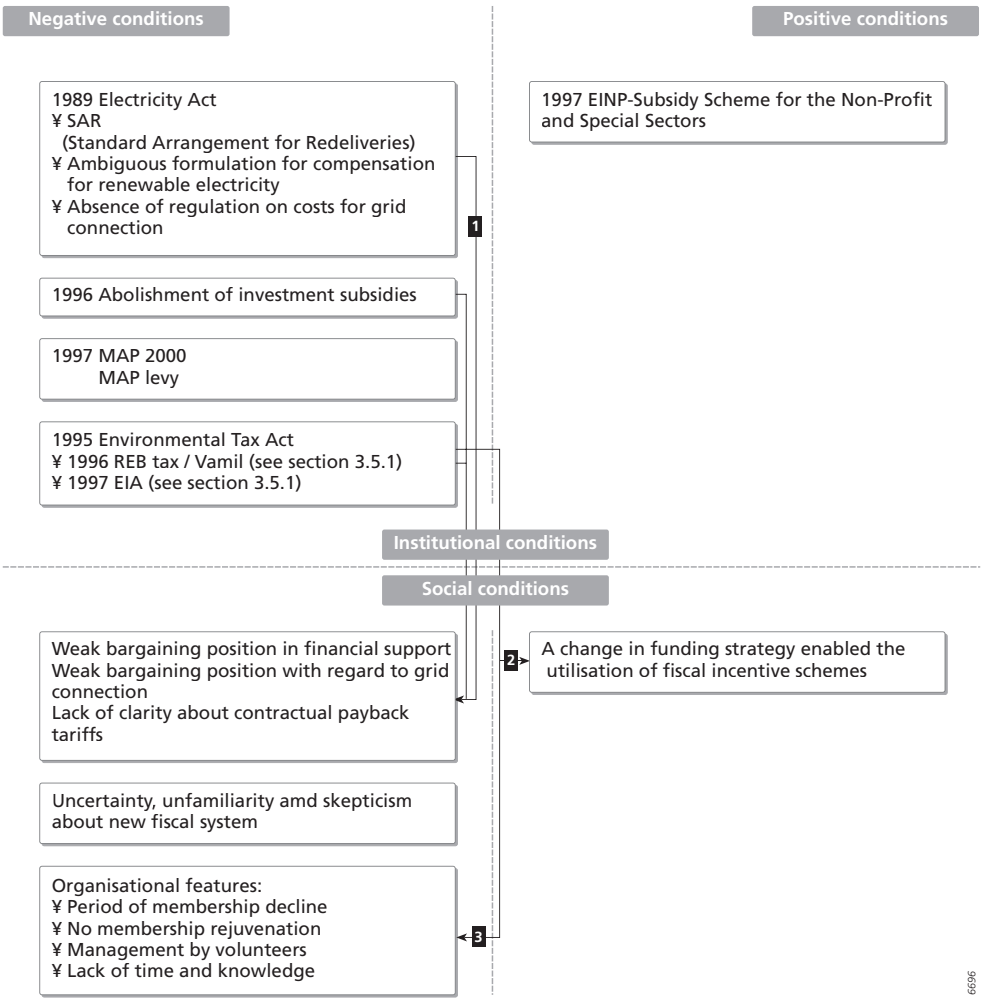


Figure 6.9 Constituent conditions of the implementation capacity for cooperatives in the Interbellum (1995-1996)

Continuing technological developments additionally stimulated this change in funding strategy. The increasing amount of capital, needed to build larger turbines, became very difficult to collect from individual members solely. The new funding strategy partly undermined a central point of departure of the wind cooperatives: developing wind projects based on strong local support and public participation. Members were no longer needed for the financing of the organisations and the projects. Membership figures stabilised or declined slightly. Registration of new members hardly occurred after 1995 (figure 6.9 arrow 3).

Like the small private investors, wind cooperative encountered problems due to a lack of clarity about the interpretation of the contractual payback tariffs in view of the new Environmental

Tax Act (see chapter 5, section 5.5). However, while PAWEX and some small private investors in the provinces of Noord Holland and Flevoland went to court to obtain clarity about the interpretation of the Environmental Tax Act, ODE and the wind cooperatives awaited these judgments.

6.7 Free market (1998-2002)

During this third period, national institutional conditions improved for cooperatives as for small private investors as we saw in chapter 5. The major improvements were (1) liberalisation of the wholesale market and accompanying rules for grid connection, (2) the greening of the fiscal system and (3) the liberalisation of the green consumer market. However, unlike small private investors, wind cooperatives were largely unable to seize the opportunities provided by the liberalised market and to adapt to the requirements set by increased competition. We will illustrate that this inability to seize these opportunities can be explained also by their voluntary character.

The 1998 Electricity Act created the framework for the liberalisation of the wholesale electricity market. It was the first important institutional change in this period. Although in general it brought advantages for wind cooperatives, it also brought some difficulties. The major advantage was that it caused the disintegration of the monopoly powers of energy distributors. The bargaining power of wind cooperatives theoretically increased, because they were no longer obliged to sell their electricity to the regional energy distributor (figure 6.10, arrow 1). However, the sale of the electricity in the new somewhat more competitive setting turned out to be problematic: '*Until recently, the sale of electricity was in a sense an automatic action. It was a matter of arranging a sufficient price with the regional electricity company. Nowadays, things are a bit more complicated. More professionalism is required to reap the rewards of liberalisation and to stipulate a good payback tariff*[29]' (figure 6.10, arrow 2).

Moreover, in section 6.6 we showed that short communication lines and a good understanding between wind cooperatives and a few regional energy distributors had been an important condition for success. The wave in concentration that took place among energy distributors at the end of the 1990s put pressure on these short communication lines. For energy distributors, feelings of solidarity with a certain region or wind cooperative lessened.

The second institutional change, the greening of the fiscal system, led to favourable economic conditions for wind power implementation, which enlarged the implementation capacity of wind power entrepreneurs in general. Moreover, the implementation of the Green Label system in January 1998, which was replaced by the green certificate system in 2001, additionally improved the bargaining position for private producers and thus for wind cooperatives (see also chapter 5 section 5.6). These institutional changes led to the emergence of many new market players, mainly small private investors and new independent wind power producers (figure 6.10, arrow 3). Different entrepreneurs were more frequently competing for the same location, a situation for which cooperatives were less well equipped than professional entrepreneurs. The more professional competitors on the market often possessed more human capacity and/or capital to hold on to a location. This competitive setting forced some wind cooperatives to

collaborate with other types of entrepreneurs: '*We were working on a location but could not keep up with developments. Because things went too slowly according to the landowner, he summoned us to cooperate with an independent wind power producer. Although this collaboration started as a marriage of convenience it in the end worked out alright* [30]'.

The liberalisation of the wholesale market and the guaranteed access to the grid stimulated three cooperatives to establish the Association of Green Energy Producers (*Stichting Groene Energie Producenten SGEP*)[31] in 1998. SGEP aimed to supply its members with green electricity without having to go through distribution companies or green retailers (figure 6.10, arrow 4). The initiative anticipated on the third institutional change in this period: the liberalisation of the green consumer market in 2001, which would offer SGEP the opportunity to supply not only members with green electricity but also other end users in the Netherlands.

SGEP is an example of a new social praxis that arose from changing institutional conditions. It can be compared with the cooperative Windunie, which was established by small private investors in 2002, with the aim of jointly selling green electricity on the electricity market (see chapter 5, section 5.7). However, whilst Windunie became rather successful and added to the implementation capacity of small private investors, SGEP failed to survive on the liberalised market (figure 6.11, arrow 5).

How can we explain this? First, the founding cooperatives encountered problems with acquiring production capacity due to their long-term contracts with distributors[32] (Marsman, 2000; Radema, 1999). However, the more important problems were organisational of character (figure 6.10, arrow 6). Due to the voluntary nature, SGEP could not keep up with developments on the rather dynamic liberalising market. In addition, differences in objectives and statutes of the founding cooperatives hampered collaboration in the area of electricity supply (De Windvogel, 2003). These problems got worse due to some personal conflicts, which hampered an efficient management[33]. Besides the three founding cooperatives, no other wind cooperatives supported SGEP. Other cooperatives joined broader market developments and started to sell their electricity to one of the emerging commercial green retailers on the market, like Echte Energie, Greenchoices and Windunie.

Only four cooperatives established turbines in this period, and the total number of projects installed by cooperatives halved again (see table 6.1). Among the four wind cooperatives that established turbines, were two of the four cooperatives who had chosen to work with a paid staff. These cooperatives, Deltawind and Zeeuwind, together established more than 80% of the turbines installed by this entrepreneurial group in this period. The other two cooperatives that worked with a paid staff (Noordenwind and Kennemerwind) did not establish any projects. In the former section, we saw that Noordenwind had to contend with difficulties in the area of local and regional policymaking. The same applied for Kennemerwind. Kennemerwind started a new project in 1997 and met with a variety of problems, including slowness in policy making by the local authorities and problems due to provincial policy on ecological shores. This provincial policy was considered incompatible with the project, which still needs to be implemented[34].

The far majority of wind cooperatives did not establish any turbines in this period. They exploited the turbines that were installed in the first market period, and they had to do with membership figures that stabilised or declined. This membership decline and the lack of recruitment of

new active members became a problem for some cooperatives: *'The active members remained the same throughout the years. We previously were eager and devoted. However, our early enthusiasm has decreased somewhat (Loenen van, 2003: 44)'*. The stagnation in the implementation of turbines and membership figures led to the disbanding of one cooperative in 2000, and to a number of mergers between small cooperatives in the province of Zuid Holland and Noord Holland in the period 2000-2002.

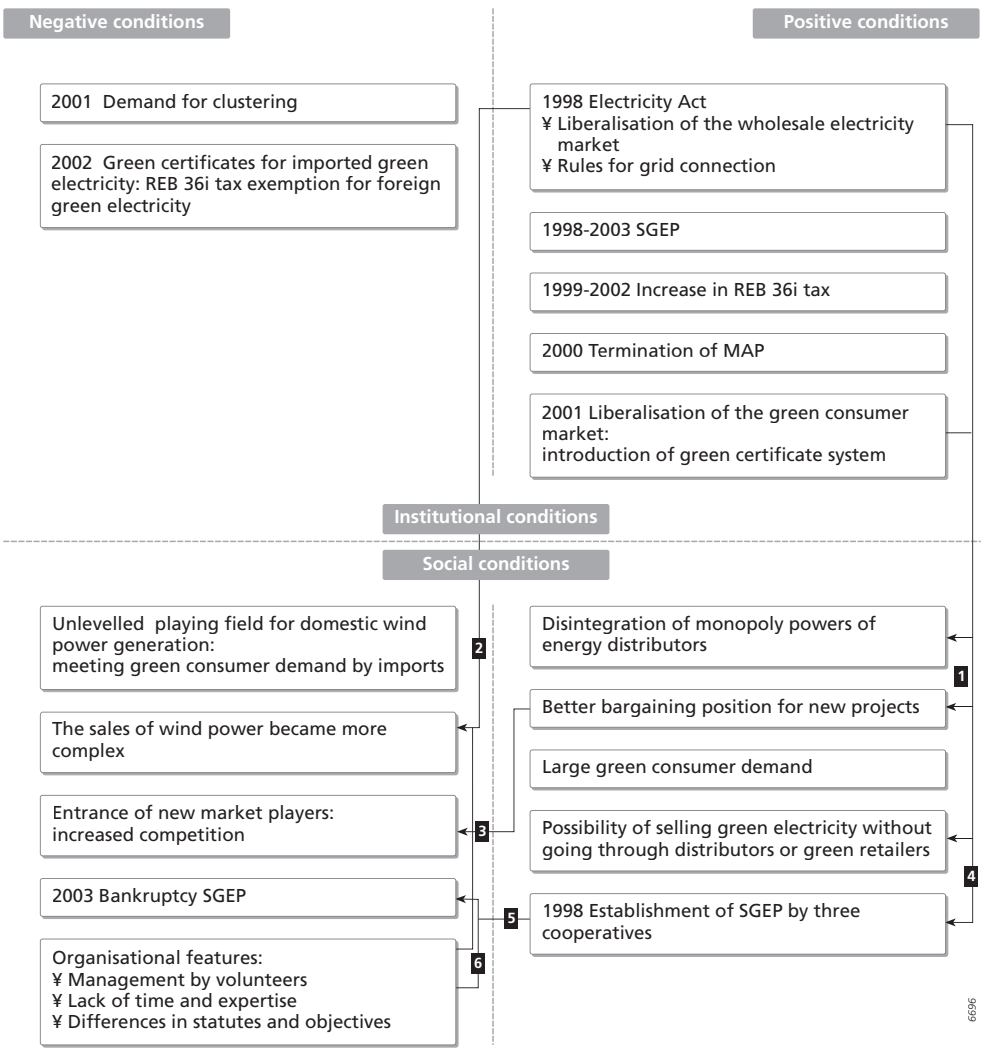


Figure 6.10 Constituent conditions of the implementation capacity for cooperatives in the Free Market (1998-2004)

6.8 Community owned wind turbines in Denmark and Germany

Before we step to the conclusions, this section compares Dutch wind cooperatives with community ownership in Denmark and Germany, i.e. countries in which joint ownership has played a major role in the successful deployment of wind power. These countries cover the majority of capacity growth in Europe over the last 15 years.

Cooperative arrangements in Denmark

The organisation of wind turbine development in Denmark is characterised by three types of ownership: wind turbines owned by wind cooperatives, wind turbines owned by single persons (such as farmers) and wind turbines owned by utilities[35]. From the 1980s until 1995, cooperatively owned turbines were dominant in Denmark. These turbines are owned and operated by about 2100 wind cooperatives, which range in size from 100 to 200 people. Over 5% of the Danish population owns a stake in a wind turbine, which increases public support for wind energy (Morthorst, 1999; Toke, 1999).

In 1978, about 40 wind turbine owners set up the 'Danish Windmill Owners Association'. This grassroots association negotiated collectively with electricity companies about the payback tariffs for private producers. In addition, this owners association and the 'Windturbine Manufacturing Association' coordinated lobbying efforts, and were able to influence national energy policy developments (Buen, 2006; Kamp, 2002: 152-153).

From the beginning of the 1980s, the national subsidy system in Denmark supported cooperative ownership, with a 30% subsidy for individual and cooperative investments in wind energy. The subsidy was based on residence criteria: only people living in the district where the turbine was located were allowed to invest. Moreover, there was a limit on the amount any one investor was allowed to invest in a cooperatively owned wind turbine. These institutional conditions kept large commercial investors out (Nielsen, 2002: 128).

A 10-year agreement in 1984, between the government, electricity companies and the Danish Windmill Owners Association additionally boosted community ownership of wind turbines: electricity companies had to pay 35% of grid connection costs and they had to buy wind electricity at 85% of consumer price[36]. In addition, an energy surcharge was introduced which was paid directly to independent energy producers (Buen, 2006: 3890; Kamp, 2002).

These policies and instruments to support community ownership matched the cooperative nature of the electricity supply system in Denmark. More than 100 power companies were responsible for the production and distribution of electricity at the time. Cooperative arrangements and municipalities owned these local power companies (Buen, 2006; Vleuten van der & Raven, 2006).

The dominance of cooperatively owned turbines remained until 1995. As of that year, single owned turbines (mainly farmers) have dominated the market. This shift in ownership concurred a relative decline in the internal rate of return for cooperatively owned turbines and a relative improvement of the internal rate of return of single owned turbines. Although, investments in wind power remained profitable for wind cooperatives, their market position declined due to competition by farmers (Morthorst, 1999).

Although idealism was the principal motivator for wind cooperatives at the beginning of the 1980s, this quickly changed. The motive to invest in jointly owned wind turbines became a hybrid one, with both environmental and economic incentives being important for an investment decision (Morthorst, 1999: 782). With revenues from cooperative investments being tax exempt, cooperative investments became extremely attractive for private individuals. The investments became tax driven (Buen, 2006: 3893-3894).

Cooperative arrangements in Germany

Wind power development in Germany started late compared to Denmark. Until the end of the 1980s, renewable energy faced a rather hostile electricity supply system and only a few idealistic enthusiasts implemented wind turbines in those years. The situation changed with the 1991 Electricity Feed Act. This act introduced guaranteed access to the grid and a proper remuneration price (90% of final consumer price) for private generators. Utilities were not entitled to receive any benefits under this act[37]. The act resulted in a market expansion of privately owned wind turbines, which, in turn, resulted in a growth of the political strength of the industry and owners association. This association was now able to add economic arguments to environmental arguments in favour of wind energy and had considerable influence on national energy policy developments (Breukers, 2005; Jacobsson & Lauber, 2006: 264-265).

The high and predictable income generation that resulted from the Electricity Feed Act motivated farmers, companies and individuals to invest in wind power. Three types of private ownership of wind turbines emerged: small independent wind power developers, farmer cooperatives and 'burgerwindparks':

Farmer cooperatives organised themselves into informal cooperatives and developed their schemes incrementally. They owned about 50% of Germany's wind power capacity in 2004.

Small independent wind power developers sold a high proportion of equity capital to local investors, mainly high-income earners. Individual investors could offset their marginal income taxes with wind power investments. In 2004, about 40% of wind power capacity was developed this way.

Burgerwindparks consisted of wind power projects owned and managed by consortia of local citizens. Burgerwindparks owned about 10% of Germany's wind power capacity in 2004 (Toke, 2005: 306-306). Only these burgerwindparks resemble the Dutch wind cooperatives, at least organisationally. They however differ in objectives. Burgerwindparks principally aim at generating sources of income by way of supplying and selling wind electricity. They emerged at a moment that investing in wind energy became financially attractive for private individuals.

Comparing Dutch, Danish and German developments

Comparing Dutch wind cooperatives with cooperatives in Denmark and Germany, we notice some remarkable differences.

First, in Denmark and in Germany wind cooperatives capitalized on governmental incentives targeted specifically at cooperative or private ownership. In the Netherlands, conversely, there were no incentives for wind cooperatives in the period when they originated.

Second, the driving force behind the Dutch wind cooperatives was and still is idealism. Although idealism played a role in the emergence of cooperative ownership in Denmark and Germany, monetary returns became a more important driving force. Wind cooperatives in

Denmark and Germany primarily aim at generating sources of income by supplying and selling wind electricity. They thus belong to the second type of cooperative arrangement as distinguished in section 6.2. Dutch wind cooperatives belong to the third variant.

Third, unlike in the Netherlands joint ownership of wind turbines in Denmark and Germany are a widely spread social phenomenon, supported by strong associations. These associations have been able to influence national level policymaking. Because community owned wind turbines were strongly represented within these associations, they have been more powerful in negotiations at national level than the wind cooperatives in the Netherlands.

6.9 Reflection on the main findings

This chapter started with describing different types of cooperative arrangements, followed by a description of Dutch wind cooperatives and their market performance. The strong ideological inclination and the grassroots and voluntary character are the most notable characteristics of these locally oriented organisations. The most striking features of their market performance are the limited number of projects and capacity installed, notwithstanding the on average moderate lead-times. Cooperatives continuously occupied a minor position on the market over the last 15 years.

Not economic, but ideological arguments were decisive in the origin of the Dutch wind cooperatives. There were no national incentives in place when these organisations were set up. On the contrary, national social and institutional conditions during the first market period were very much to their disadvantage. Despite these negative national conditions and despite limited organisational resources, such as finances and expertise, most cooperatives managed to implement one or a couple of wind turbines. This relative success depended on their own decisiveness and enthusiasm, combined with regional and local institutional regulatory and social conditions, such as willingness at the side of the regional energy distributor to pay a proper compensation per kWh. Local social relations and short communication lines added to the implementation capacity of particular cooperatives. However, differences in these local conditions were huge and laid the foundation of a partition in three different subgroups, which followed different development paths and performed different throughout the years.

The first group consists of 11 wind cooperatives, which have disbanded or have merged. The mergers took place in the first and the third market period. Mergers took place between small cooperatives from the same region. A lack of human capacity and a lack of success in implementation prompted these mergers.

The second group encompasses the wind cooperatives who continued to exist, but which are moderate in size and own just a limited number of turbines. The far majority of these cooperatives did not establish any turbines since 1995. Compared to other professional entrepreneurial groups, they were less well equipped to deal with the depersonalisation of the market, increased competition, and the increase in the scale of wind power projects. Their strong local roots and, in theory, large degree of public support turned out to be of less importance. The analysis of problems in planning and licensing of projects showed that, despite the explicit

idealistic background and the strategy of developing projects based on strong local support and public participation, wind cooperatives experienced more problems with social resistance than small private investors did. This contradicts their self-image of being organisations with a strong community commitment.

The third group encompasses the four larger cooperatives, who have more or less professionalized and who have established the majority of turbines installed by this entrepreneurial group. They work with a paid staff and continued to realise wind power projects in the second and third market period. It seems reasonable to conclude that the degree of professionalism influenced the success in the operational process of implementation and determined the concentration in ownership within this entrepreneurial group. Only cooperatives that moved from the third variant of cooperative arrangement to the second variant of cooperative arrangement (section 6.2) have been able to hold their own as an investor on the market. However, the locality of these more successful cooperatives correlates to areas with favourable payback agreements at the beginning of the 1990s. Moreover, two of the four cooperatives that worked with a paid staff did not establish any projects since 1996. They had to contend with difficulties in the area of local and regional policymaking. Clearly, the degree of professionalism is not the only condition that determines the success of a cooperative. Regional and local social and institutional conditions are just as important.

Wind cooperatives as a group did not follow an economic rationality. The implementation capacity for wind cooperatives was always low in comparison to that of energy distributors and small private investors. Nevertheless, they continued to strive for wind power implementation. Looking at the figures 6.8 and 6.9, we notice the absence of positive national social and institutional conditions in the first and second market period. In spite of this, it was during the first period that cooperatives put into place most of the turbines they would ever implement, which can be explained only by local and regional institutional regulatory and social developments. The third period is a different story. Looking at figure 6.10 and comparing it with figure 5.9 (same period in chapter 5) we notice the similarity of national social and institutional improvements for small private investors and wind cooperatives. However, while implementation by small private investors really expanded, it did not for wind cooperatives. Their amateurish and idealistic character kept them from seizing the opportunities provided by the broader process of liberalisation.

The comparison with Denmark and Germany put the performance of the Dutch wind cooperatives in a broader perspective. Dutch wind cooperatives belong to the third variant of cooperative arrangements as distinguished in section 6.2. This is the only variant, for which ideological incentives are the decisive driving force behind activities. Cooperatives in Germany and Denmark, in contrast, belong to the second variant, for which monetary returns are more important. In these countries, cooperative arrangements capitalized on governmental incentives targeted specifically at cooperative or private ownership. The main reason for the expansion of cooperatively owned wind turbines in these countries is that cooperative investments became extremely attractive for private citizens. Especially in Denmark, wind cooperatives became a widely spread social phenomenon, supported by a strong wind power association. In the Netherlands, wind cooperatives remained a marginal phenomenon, and the umbrella association ODE never became influential, i.e. able to determine national energy development.

Notes

1 Parts of this chapter are taken from an article published in Energy Policy © 2004 (Agterbosch, Vermeulen & Glasbergen, 2004).

2 Four wind cooperatives also support projects in the area of sustainable energy in developing countries.

3 Most quotations in this section are taken from a graduate paper supervised by Prof. Pieter Glasbergen and Susanne Agterbosch: Loenen van (2003) Vechten voor Windmolens; Over windcoöperaties in Nederland (Fighting for Windmills; about wind cooperatives in the Netherlands).

4 Middelbos, A. (Employee Deltawind) Personal communication 12 January 2004 and Tieleman, M. (Advisor of the board of Deltawind) Personal communication 6 January 2004.

5 Zeeuwind donated about €260.000 euro in 2002 and €386.000 euro in 2003 to these projects (Zeeuwind, 2004: 8).

6 Zeeuws Platform Sustainable Development (*Zeeuws Platform Duurzame Ontwikkeling*) is a partnership of several regional NGO´s and the regional energy distributor Delta.

7 The cooperative De Windvogel is an exception. The working area of this cooperative is not restricted to the locality of the organisation.

8 These wind cooperatives are Deltawind and Delft. Also the village associations in the province of Friesland employ a strict residence requirement. These associations are made up of people living in the own village.

9 As is been paid (on average) by banks.

10 Cooperative De Windvogel is the third cooperative in terms of membership figures. Also this cooperative kept on growing. However, four different mergers caused this growth.

11 Stoop, W.B. (Secretary Kennemerwind) Interview by Loes van Loenen 11 June 2002

12 These cooperatives are Delft, WWC and WDE.

13 Professionalized cooperatives: Zeeuwind (first employee hired in 1989, 4 employees in 2002), Noordenwind (first employee hired in 1994, 2 employees in 2002), Kennemerwind (one employee hired in 1998), and Deltawind (one employee hired in 2000) (Agterbosch et al., 2004: 2061).

14 Springer, J. (Employee Zeeuwind) Personal communication 20 March 2002.

15 Deltawind, De Windvogel, Kennemerwind, Meerwind, WDE, WWC, Zeeuwind, ZEK

16 Noordenwind, Uwind, Waterland

17 De Eendragt, Noord-Brabant, Delft

18 The number of projects in the survey was limited. We received 20 questionnaires, 12 about projects realised before 1998, six about projects that had been recently completed and two about projects that could not be implemented. Nevertheless, the survey covered 29% of all projects, 45% of all turbines and 67% of the capacity installed by wind cooperatives in the Netherlands. Moreover, all Dutch wind cooperatives participated so no cooperative was over represented. In view of these figures, it is reasonable to assume that the results of the survey are a representative assessment of experiences of this entrepreneurial group.

19 Minimum 16 months, maximum 87 months.

20 The period required for authorisation is 1,5 years (18 months) for the exemption of the municipal land use plan, the assignment of the Construction Permit and the assignment of the Environmental Permit, if each of these procedures is dealt with successively (apart from the terms required for appeal). This period required for authorisation is prolonged to 1.9 years (23 months) if the municipal land use plan must be revised.

21 (1) Moleferiening "Út é lyte" (Hitsum), (2) Stichting Wynturbine De Twa Doarpen (Wiuwert/Britswert), (3) Dorpsmolen Reahûs (Reahûs), (4) Stichting Wiek (Kûbaard), (5) Dorpsmolen Wyntsjesnijer (Tzum), (6) Feriening Skûster Doarpsmoune (Idsegahuizum) and (7) Dorpsmolen Wommels (Iens) http://www.duurzameenergie.org/odewindcoop.html viewed at 5 January 2005.

22 Uwind, the wind cooperative in the province of Utrecht, has not installed any wind turbine yet.

23 The option 'neutral' is not represented in the figure. Therefore, the sum of the categories shown does not necessarily equal 100%.

24 Langenbach, J. (Former employee ODE) Email communication 13 January 2006.

25 Kruize, E. (Member of the board of Noordenwind), Personal communication, 17 November 2004.

26 Tieleman, M. (Advisor of the board of Deltawind), Personal communication 6 January 2004 and Middelbos, A. (Employee Deltawind) Personal communication 12 January 2004.

27 Wind Service Holland http://home.wxs.nl/~windsh/windsteun.html viewed at 16 November 2005 and Gipe, P. http://www.wind-works.org/articles/Euro96TripReport.html viewed at 13 January 2006.

28 It took the national government two years to repair the gap in the fiscal scheme: in 1997, the EINP-Subsidy Scheme for the Non Non-Profit and Special Sectors was introduced.

29 Based on Springer, J. (Employee Zeeuwind) Personal communication 20 March 2002, Wiezer, F. (Representative ODE) Interview by Loes van Loenen 8 July 2002 and Stoop, W.B. (Secretary Kennemerwind) Interview by Loes van Loenen 11 June 2002.

30 Springer, J, (Employee Zeeuwind) Personal communication 20 March 2002.

31 SGEP was established by Meerwind, De Windvogel and WDE.

32 To get started, SGEP needed production capacity and members to deliver the electricity. Both were acquired by means of a merger between SGEP and the cooperative Betuwind. The members of the cooperatives De Windvogel and Meerwind were also offered membership of SGEP, which additionally enlarged membership figures. However, the transfer of additional production capacity turned out to be a problem because of long-term contracts with energy distributors (Meerwind 1999, Meerwind 2000).

33 Anonymous (Member of the board of one of the founding cooperatives), Personal communication, 4 June 2002.

34 Stoop, W.B. (Secretary Kennemerwind), Written communication, 20 December 2004.

35 Wind turbines owned by utilities were mainly erected on request of the government and played a minor role on the Danish wind power supply market (Morthorst, 1999: 781-782)

36 Local ownership, imposed by the subsidy rules, stimulated the Danish wind turbine manufacturing market. Danish wind turbine buyers, being private persons or cooperatives, cooperated with the manufacturers to improve the turbines (Kamp, 2002: 160).

37 In 2000, the Renewable Energy Sources Act replaced the Electricity Feed Act. Now utilities qualify for a feed-in payment as well.

7 New commercial independent wind power producers

7.1 Introduction[1]

This final chapter on entrepreneurial groups deals with the performance of new independent wind power producers (NIWPs)[2]. The question will be answered whether a new market has originated, characterised by competition and new types of entrepreneurs. The possibility of commercially attractive exploitation of wind turbines is a prerequisite for the emergence of this type of investor on the wind power project and green electricity market. When considering absolute numbers of total capacity installed by these new market players, one notices that they occupied a minor position on the market during the 1990s. Over the last four years, however, the market position of NIWPs changed. The relative importance of this entrepreneurial group increased considerably, and even surpassed energy distributors.

We will show that this increase in importance coheres with the emergence of a rather heterogeneous group of NIWPs at the moment of liberalisation. The liberalisation of the market, and the substantial increase in the REB tax between 1999 and 2002 with a corresponding increase in the profitability of projects, were crucial for the emergence of this entrepreneurial group. Until these institutional changes, only a very limited number of NIWPs had been active on the wind power supply market.

It was also at the end of the 1990s, that the possibility of investing in a new wind power market emerged, i.e. the offshore wind power supply market. Since the offshore market, the entrepreneurs and government authorities involved, differs significantly from the onshore market, it is only addressed to a limited extent. The primary focus of this chapter is the emergence and performance of onshore NIWPs.

7.2 Types of new independent wind power producers

Looking at the development of the Dutch wind power market, one can see new independent market players emerging at different points in time. These market players can be divided in different types of entrepreneurs with different activities and different products. The majority of new independent entrepreneurs were (and are) engaged only as consultants for third parties like landowners, utility companies or government authorities, both in the Netherlands and abroad. Among the very few consultancies at the beginning of the 1990s were the Association Wind Energy Noord Nederland (*Stichting Wind Energie Noord Nederland -SWNN*) and MEA-adviesburo[3]. These two one-person companies, situated in the province of Friesland, aimed for facilitating farmers in implementing wind turbines. Up to 1995, 248 turbines or 22 MW were established with help of SWNN and about 20 MW was established with help of MEA-

adviesburo. These figures equal to 73% of the capacity installed by farmers and 16.3% of total capacity installed up to 1995. Today, about 60 Dutch consultancies are specialised in one or more aspects (technical, legal, financial or local planning aspects) related to renewable energy project development. A few of these entrepreneurs also develop wind projects at their own expense and in the end own and operate the wind turbines themselves. In this chapter, the focus is on this last, relatively small, group of NIWPs.

Figure 7.1 gives an overview of the market division of total capacity installed by NIWPs in the first and second market period. Until the middle of the 1990s, only three NIWPs were either active on or emerged onto the wind power market. Two of them came from the (renewable) energy sector, and included a subsidiary company of a wind turbine manufacturer and an early innovative consultancy in the field of environmentally sound projects, particularly renewable energy projects. The third company was a steel company. Nowadays, they all are relatively small companies with no more than 10 to 20 employees working on wind energy. Besides these three early NIWPs, several wind turbine manufacturers implemented and exploited wind turbines on very small-scale.

At the end of the 1990s (1997- 2000), a rather heterogeneous group of about 15 NIWPs emerged onto the market, including both one-person companies and large holding companies with contracting work as their core business. Not all of these NIWPs still exist. Neither have they all succeeded in establishing wind turbines, though some of those, who have not succeeded so far, are close to implementation[4].

Four types of entrepreneurs can be distinguished among this heterogeneous group of companies, who develop wind projects at their own expense and in the end own and operate the wind turbines themselves. The distinction is based on the origin of these companies. Only the first three types are NIWPs as defined in chapter 2.

1. Experts: companies that emanate from the (renewable) energy sector, having founders, who formerly were employee from an energy distributor, from a consultancy in the area of (renewable) energy or a wind turbine manufacturer,

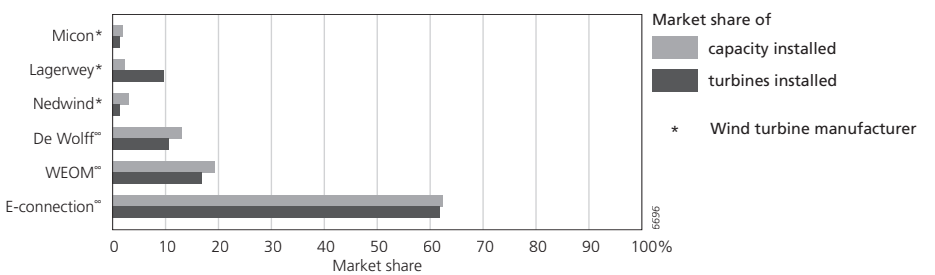


Figure 7.1 Market shares of total capacity and turbines installed by new independent wind power producers over the period 1989-1997.

2. Opportunity seekers: existing companies, who following from their own core-business see a new business opportunity in wind power project development: wind power exploitation becomes a new part of their core-business,
3. Outsiders: new companies, having no relationship to the (renewable) energy sector whatsoever. This type includes small private investors, who changed their core-business from agriculture to wind power project development (not on their own land).
4. The fourth and final type is not a NIWP as defined in chapter 2. These wind turbines operators are wind turbine manufacturers or wind turbine research institutes. These companies and institutes implement and exploit wind turbines with the aim to test turbines. Wind power exploitation is not a part of their core-business[5].

Table 7.1 gives an overview of NIWPs, active in the Netherlands in 2004. The table excludes the fourth type of wind turbine operator and consultants in the area of renewable energy project development, who do not intend to own and operate the turbines themselves. The table shows that the majority of NIWPs emanated from the (renewable) energy sector (type 1) and that the far majority emerged in the third market period, at the moment of liberalisation.

Figure 7.2 provides an overview of the market division of turbines installed and exploited by NIWPs over the period 1998-2004. Those companies that have not yet succeeded in establishing

Table 7.1 New independent wind power producers on the Dutch wind power market

New independent wind power producer	Origin	Start
1. E-Connection	Type 1: experts	Period 1 – 1986
2. De Wolff Nederland Windenergie	Type 2: opportunity seeker	Period 1 – 1991
3. WEOM*	Type 1: experts	Period 1 – 1993
4. Promill	Type 1: experts	Period 1 – 1994
5. Groenraedt	Type 2: opportunity seeker	Period 2 – 1996
6. Koop Duurzame Energie (Millenergy**)	Type 2: opportunity seeker	Period 3 – 1998
7. Wind Groep Holland	Type: unknown	Period 3 – 1998
8. GEP Nederland	Type: unknown	Period 3 – 1997/1998
9. GEN***	Type: unknown	Period 3 – 1997/1998
10. Maliepaard Windenergie	Type 3: outsider	Period 3 – 1998
11. De Wilde Wind	Type 3: outsider	Period 3 – 1999
12. Evelop	Type 1: experts	Period 3 – 1999
13. Wind Constructors International:		Period 3 – 2000
Wind Energie Nederland	Type 1: experts	
Ballast Nedam Infra Noord West	Type 2: opportunity seeker	
14. WinWind	Type 1: experts	Period 3 – 2000
15. Kemperman & Partners Projecten	Type 2: opportunity seeker	Period 3 – 2002
16. Ter Schuur Windturbines	Type 1: experts	Period 3 – 2003
17. Prodeon	Type 1: experts	Period 3 – 2004

* In 2000, WEOM became a 100% daughter company of Nuon NV.
** Koop Duurzame Energie BV (a 100% daughter company within Koop Holding) decided to cooperate with energy distributor Essent. Koop and Essent established a joint venture Milenergy at the end of the 1990s.
*** In 2002, ENECO bought GEN and all of its projects that were in an advanced phase of project development. The portfolio of GEN consisted of 20 projects that were in a rather advanced phase of development. For all of these projects, the formal authorisation trajectory could be started.

wind turbines are not included in this figure: the figure represents market shares in terms of ownership. Some of the companies in figure 7.2 were also engaged as consultant for third parties, like farmers and energy distributors. De Wolff, for instance, has been engaged in 168 projects with a total capacity of 203 MW up to 2004. This is a 17.6% market share of total capacity installed in the Netherlands up to that year. Although Groenraedt is market leader in terms of ownership figures, De Wolff is more important when these consultancy activities are reckoned in.

Comparing the figures 7.1 and 7.2, we notice that market shares became more even divided over a range of market players in the third market period. The early companies, who were already active on the wind power market in the first market period, were still important in the third period. In addition we notice that the two most successful NIWPs, in terms of capacity installed by the end of 2004, are companies that emanated from existing companies, who following from their own core-business saw a new business opportunity in wind power exploitation (type 2).

So far, we focused on onshore wind power entrepreneurs, investing in onshore wind power projects. At the end of the 1990s, however, a new wind power investment option presented itself: the offshore wind power supply market. This option was first announced in the Third White Paper on Energy in 1996, which set a target of 3000 MW wind energy in the year 2020, for 50% to be realised by offshore wind. These targets were developed further in the Action Programme for Renewable Energy in 1997, which announced a plan for the development of offshore wind energy. The offshore wind power industry and supply market differ significantly from the onshore wind power supply market. Offshore wind projects are large capital-intensive multi megawatt projects in marine locations bringing about technical, physical and environmental challenges

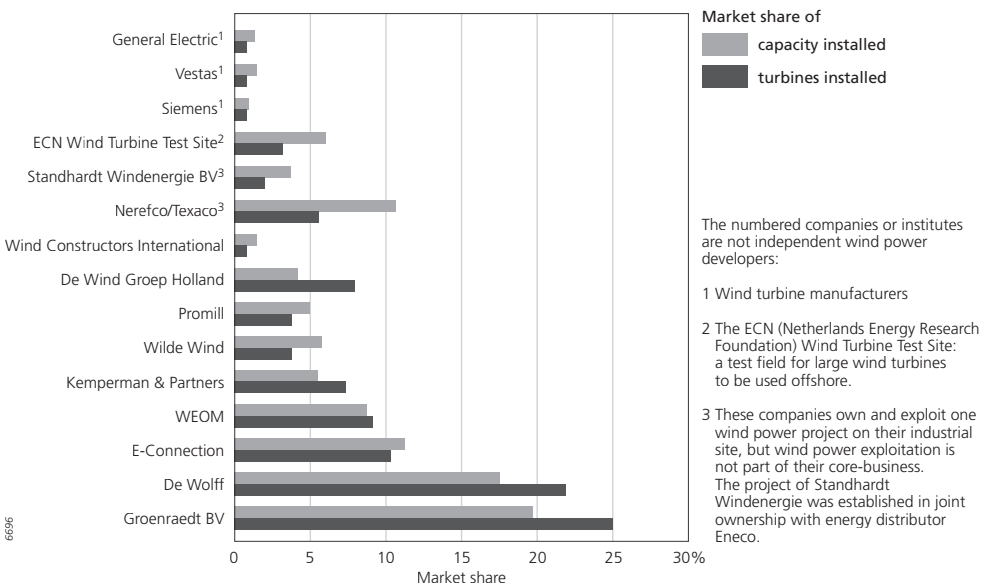


Figure 7.2 Market shares of total capacity and turbines installed by new independent wind power producers over the period 1998-2004.

not encountered onshore. Only joint ventures or consortia composed out of the international offshore and wind industries are able to meet these challenges. Since the offshore market is a different phenomenon, with different entrepreneurs and government authorities involved, we will not consider it at length in this thesis. Main lines will be addressed separately in section 7.7 at the end of this chapter.

7.3 Market performance

The performance of onshore new independent wind power producers in terms of capacity implemented in the different Dutch provinces over the last 15 years can be described on the basis of the following features:

1. a minor position on the market in terms of capacity installed during the 1990s, followed by a relative increase in importance since the year 2000,
2. an increase in the number of projects and in solitary installations in the third market period,
3. a very limited number of market players unto the end of the 1990s, followed by the emergence of a rather heterogeneous group of NIWPs in the third market period,
4. a geographical concentration of investments in the coastal provinces,
5. a strong decrease in the employment of the joint ownership strategy in the third market period.

The first feature, the position on the wind power supply market has been described in chapter 3 (see figures 3.1, 3.2 and 3.3). During the 1990s, new independent wind power producers were of minor importance. The annual contribution in terms of capacity installed, fluctuated between 0% and 9%, with some exceptional peaks in the years 1992, 1995 and 1997, when they respectively realised 23%, 15% and 16% of total capacity installed. Over the last 4 years (2001-2004), the market share of NIWPs increased to 23.6% on average. Market shares in these four years of energy distributors and small private investors were respectively 14.3 and 62.1 on average. Bearing in mind that almost 60% of total capacity installed in the Netherlands has been realised in the years 2001-2004, justifies the conclusion that the relative importance of NIWPs increased considerably over the last few years and even surpassed energy distributors.

The second feature of the performance of this entrepreneurial group is the increase in the number of projects, combined with an increase in the number of solitary installations (see table 7.2). Simultaneously, the share of large-scale projects (above six turbines) remained rather high (about 15%). The variances in project size combined with technological progress explain the simultaneous appearance of the decrease in the average number of turbines installed per project and the increase in the average capacity installed per project.

The third feature is the limited number of market players unto the end of the 1990s, followed by the emergence of a rather heterogeneous group of NIWPs in the third market period. This feature has been described in the former section.

Table 7.2 Project characteristics of projects realised by new independent wind power producers

Size of project	1989-1995		1996-1997		1998-2004	
	Number	%	Number	%	Number	%
Solitary	5	33.3	3	33.3	39	58.2
2 or 3 turbines	2	13.3	3	33.3	14	20.9
4 or 5 turbines	3	20.0	2	22.2	4	6.0
6 to10 turbines	3	20.0	1	11.1	9	13.4
11 and above	2	13.3	0	0	1	1.5
Average number of projects per year	2.1		4.5		9.6	
Average number of turbines per project	4.8		2.7		2.5	
Average capacity per project (MW)	1.7		1.2		3.2	

The fourth feature of the performance of this entrepreneurial group is the geographical concentration of investments in the coastal provinces (figures 7.4 and 7.5). Up to 1995, the province of Zeeland was frontrunner with a 63.4% market share of capacity installed by NIWPs. The provinces of Zuid Holland and Friesland followed at distance with market shares of respectively 13.4% and 12.8 %. The positions changed in the course of the years. The role of the province of Flevoland strongly grew with a market share of 38.7% of total capacity installed by NIWPs since 1995. Developments in Zeeland went in the opposite direction, with a 6.9 % market share of total capacity realised by this entrepreneurial group in this period.

The final feature of the performance of this entrepreneurial group is the strong decrease in the employment of the joint ownership strategy in the third market period. In total 57.9 MW or 23.1% of total capacity implemented by NIWPs has been realised in joint ownership with other types of entrepreneurs. In the first and second market period, about 70% to 75% of total capacity installed by NIWPs was implemented in joint ownership. This share has decreased to 14.3% of total capacity installed by this entrepreneurial group since 1998[6] (see figure 7.3). The importance of the joint ownership strategy in the first market period can be attributed to the company E-Connection who established 62% of total capacity installed by NIWPs up to 1998, almost entirely in joint ownership.

Looking at these five features and comparing them with the market performance of the other three entrepreneurial groups (as described in the chapter 4, 5 and 6), we observe that NIWPs, like wind cooperatives, are in between energy distributors and small private investors in terms

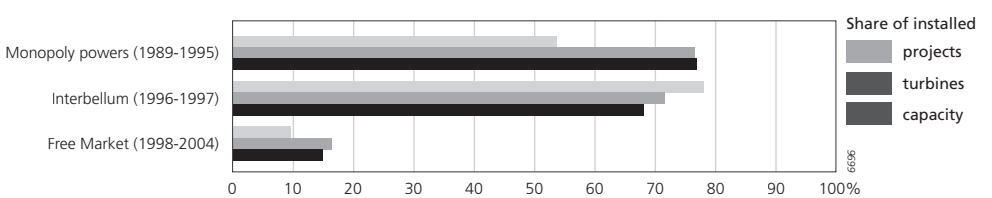


Figure 7.3 Joint ownership share of projects, turbines and capacity installed by NIWPs

of the average project scale. However, while the number of projects and capacity installed by wind cooperatives decreased, NIWPs managed to establish an increasing number of projects in the third market period. They even surpassed energy distributors in terms of capacity installed. This is remarkable, in view of the fact that the majority of NIWPs emerged relatively late on the wind power market. Despite this late start (compared to the other three entrepreneurial groups) they managed to occupy a rather important market position. Another remarkable feature is the employment of the joint ownership strategy in the third market period. Whereas the relative importance of this strategy increased for energy distributors and wind cooperatives, and remained limited for small private investors, NIWPs deviate on this aspect. The relative importance of the joint ownership strategy strongly decreased for this entrepreneurial group.

This chapter serves to explore to what extent the features of the performance of NIWPs can be explained by changing social and institutional conditions, such as changing legislation, changing financial incentive schemes, organisational features and strategies chosen by NIWPs and other stakeholders involved in implementation. In the next sections, we shift to a combined regional and national perspective to analyse the performance of the NIWPs. We will focus on how different NIWPs have reacted upon changes in social and institutional conditions in each of the three market periods.

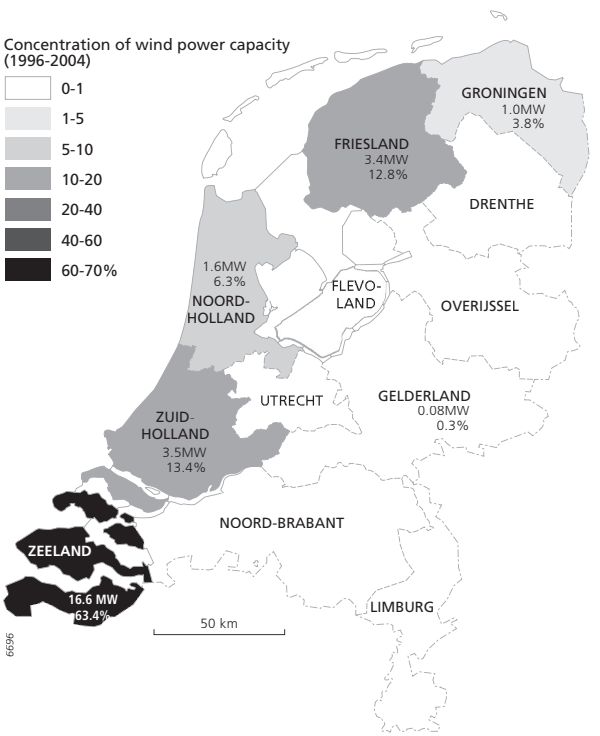


Figure 7.4 Geographical concentration of wind power capacity installed by new independent wind power producers (1989-1995).

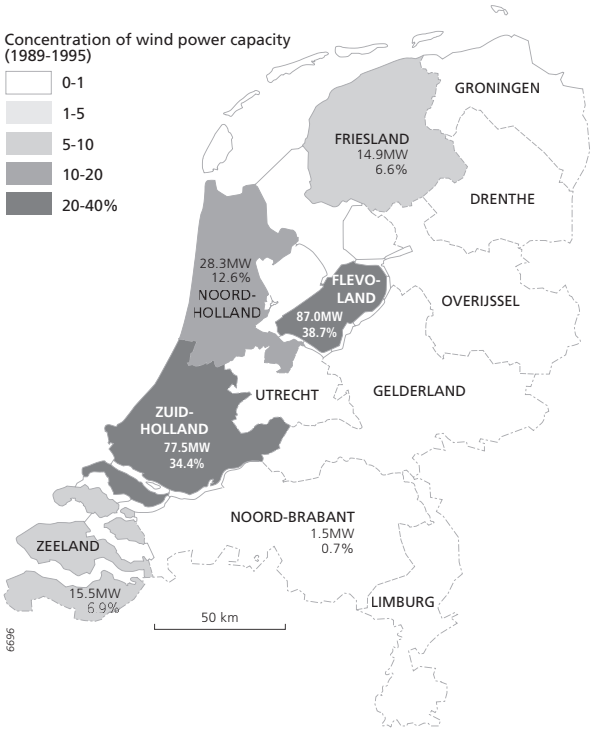


Figure 7.5 Geographical concentration of wind power capacity installed by new independent wind power producers (1996-2004).

7.4 Monopoly powers (1989-1995)

With respect to the configuration of national social and institutional conditions, the situation for new wind power producers was comparable to that of small private investors during this period, that of a rather weak implementation capacity in comparison to energy distributors. The payback tariffs consisted of an avoided costs component (SAR) and the MAP subsidies. All private investors were in the same disadvantaged position with regard to the assignment of these components (see chapter 3, section 3.3.2 for an explanation of SAR and MAP). The motivation of commercial investors to make wind power exploitation part of their core business was limited for that reason.

The small number of NIWPs, active in this period, performed similar to small private investors, at least in terms of capacity installed. In terms of the number of projects and turbines installed, their performance was less than any other type of wind power entrepreneur. To be able to explain this gap in the number of turbines installed, some important differences between NIWPs and small private investors need to be considered.

First, small private investors usually had a site location, which is a social condition that new wind power producers lack. Second, whereas for small private investors wind power exploitation was a supplementary source of income, for new wind power producers it was part of their core

business. New wind power producers needed a more promising commercially attractive market in order to emerge, so a better configuration of national conditions was required. A third difference was that small private investors by far outnumbered the NIWPs.

In fact, only three NIWPs were active on or emerged onto the wind power market in this first monopolistic market period. These companies were E-Connection, De Wolff and WEOM (see figure 7.1). How can we explain their early emergence?

The first NIWP, E-Connection started its activities in 1986. The founder of this type 1-NIWP was one of the founders of the Centre of Energy saving and Clean Technology (*Centrum voor Energiebesparing en Schone Technologie*). This independent research and consultancy centre was set up in 1978 and investigated energy saving options, and the potential of renewable energy[7]. Government authorities and business organisations commissioned these feasibility studies but, according to the founder of E-Connection, never applied the results. E-Connection started developing wind power projects to demonstrate the feasibility of these projects. Initially, these activities were financed with own money, complemented with earnings from small-scale consultancy activities[8].

The establishment of E-Connection coincided with the implementation of the Integral Program on Wind energy (IPW) in 1986. This first governmental programme, with an investment subsidy specifically for wind turbine buyers, provided subsidies in the range of up to 35 to 40% of total project costs. The availability of these subsidies made the purchase and exploitation of wind turbines financially much more interesting compared to the previous period. E-Connection used the IPW subsidies for the implementation of wind turbines. The first were implemented in 1989[9]. This coincided with the year that the energy distributors established Windplan. The establishment of this wind energy implementation scheme, which aimed for the installation of 250 MW of wind power in 1995, generated some large assignments for E-Connection. The company collaborated with energy distributor PGEM (later Nuon) and the ethical bank Triodos Ventures in the development of some large-scale projects in the province of Friesland and Flevoland[10]. PGEM intended to use these projects for meeting its share in the Windplan target.

The second NIWP in this period was a type 2-NIWP: De Wolff was a family company in the metal industry located in the province of Friesland. This province was forerunner in terms of turbines and capacity installed at the beginning of the 1990s. Most of these turbines (66%) were installed by small private investors, who mainly implemented the 80 kW Lagerwey windmill. The implementation of these turbines aroused De Wolff's interest because of the steel construction of the masts. The company decided to study the option of getting into wind turbine masts production and visited two wind turbine manufacturers (Nordtank and Bonus) in Denmark in 1991. The choice to visit Nordtank and Bonus was prompted by the fact that these two manufacturers were selected as foreign suppliers for Windplan[11]. Collaboration between De Wolff and Nordtank emanated from this visit and De Wolff started as agent of Nordtank by the name of De Wolff-Nordtank Windenergie[12].

Because Windplan was largely reserved for Dutch manufacturers, De Wolff-Nordtank decided to focus its sales activities on the agricultural market. However, the majority of the farmers in the province of Friesland were facilitated by the Association Wind Energy Noord

Nederland (*Stichting Wind Energie Noord Nederland -SWNN*). This association was founded by a retired social worker with roots in the anti-nuclear movement. SWNN settled the implementation trajectory for more than 80% of all turbines installed by farmers in this province up to 1995. This peculiar consultant enjoyed the farmers' confidence. He offered his services for very low prices and was actively involved in the regional umbrella association of wind turbine owners. The far majority of the turbines implemented with the help of SWNN were Lagerwey windmills, none were Nordtanks.

With the agricultural market covered by SWNN and the utilities market covered by Windplan, De Wolff-Nordtank got nowhere. After two years, not even one Nordtank wind turbine was sold. It was out of need that De Wolff decided to start developing wind power projects itself in 1993[13]. At that moment, the regional energy distributor PEB (later Nuon) had a fully licensed location available for De Wolff. It was a location for a solitary turbine, which did not fit with the preference for large-scale applications by the energy distributor. This location enabled De Wolff to install the first Nordtank wind turbine. The turbine demonstrated the quality of Nordtanks: it performed very well, which did not remain unobserved by the market.

In the mean time, the wind power implementation scheme of the energy distributors (Windplan) was dissolved. At the moment of this breakdown, the price-performance ratio of Dutch wind turbines[14], was poorer than the price-performance ratio of Danish turbines. This difference in performance was a result of the design of the IPW investment subsidy. Wind turbine buyers received an amount of money per kW installed, which made Dutch manufacturers to 'boost' the generators of the turbines in order to maximise the subsidies for customers (which were energy distributors within the framework of Windplan) (Johnson & Jacobsson, 2002; Kamp, 2002: 122-123). Now that Windplan was dissolved, De Wolff-Nordtank gained access to the utilities market. The good price-performance ratio of the Nordtank wind turbines motivated the energy distributor Nuon to buy Nordtanks for two large-scale wind power projects[15]. By the end of 1995, more than 60 Nordtank turbines were installed in the Netherlands. These turbines were owned by energy distributor Nuon (49), De Wolff (7) and farmers (7).

The third NIWP, WEOM, started its activities in 1993. WEOM was established by Nedwind, one of the Dutch turbine manufacturers who expected large orders from Windplan at the beginning of the 1990s. The breakdown of Windplan implicated that a considerable part of the already small domestic market evaporated. The establishment of WEOM was a strategy to compensate for the decrease in orders. In 1995, WEOM became an independent company and in the same year the first 3.5 MW wind power project was installed. Besides project development with the intention to own and exploit turbines, WEOM was actively engaged as consultant for third parties, especially for Novem (an agency of the Ministry of Economic Affairs) and energy distributors.

The three early NIWPs met with considerable problems with the financing and insuring of projects, which hampered their implementation capacity. Continuing technological developments led to the availability of larger turbines and a corresponding increase in investment costs in 1994 and 1995. Small private investors mainly used private finance, with farming assets and land as the loan guarantee[16]. Cooperatives used participation finance with money from the members of the cooperative. NIWPs, however, were unable to privately finance their projects and did not possess any non-project assets, such as land, as collateral. They, like all wind power entrepreneurs,

could use investment subsidies up to 35% of investment costs[17], but in addition needed project finance, which was hardly available at the time. A related problem was the lack of a proper insurance product for wind power projects. Insurances were unavailable or very expensive in the Netherlands, which was a consequence of the many technical problems with the large-scale pilot project of the SEP at the end of the 1980s (see chapter 3, section 3.3.1) and the bad track record of Dutch turbines ever since. De Wolff, being both supplier and operator of wind turbines, worked in close collaboration with Nordtank and a German insurance company on guarantee and insurance conditions, and managed to establish a proper insurance policy for its wind turbines. Despite this new insurance product that covered all risks for the first five years, attracting banks for financing wind power projects remained a problem[18].

The ending of the investment subsidies in 1995 also caused the number of projects, turbines, and total capacity installed by this small group of new wind power producers to peak. Like other types of professionalised entrepreneurs with a clear rational behaviour with respect to changes in conditions, they were able to force their projects through. In 1995, 67 turbines (32 MW) were installed by the three new wind power producers and some manufacturers (see figure 7.1). This is a considerable achievement for such a small number of entrepreneurs. They were clearly well equipped to be active in the field of wind energy project development, and they were able to cater to changing institutional and social conditions.

A final remark with regard to this first market period relates to the establishment of different branch organisations. E-Connection and the Association of Wind Turbine Owners in the Province of Friesland (*VWF – Vereniging van Windturbine eigenaren in Friesland*) were founders of the Union of Private Wind Turbine Operators (PAWEX) in 1989. PAWEX took an action for arbitration against the Federation of Energy Distributors in the Netherlands at the beginning of the 1990s[19]. PAWEX was clearly distinct from the Dutch Wind Energy Association (*Nederlandse Windenergie Vereniging* – NEWIN), which was also established in 1989. The original corporate members of NEWIN at the beginning of the 1990s were mainly energy distributors, and the Federation of Energy Companies in the Netherlands (*EnergieNed*). PAWEX and NEWIN served different interests; the wind power supply branch representation was fragmented of character.

7.5 Interbellum (1996-1997)

The switchover to the new fiscal system ushered in a new era for new wind power producers. The gradual introduction of fiscal instruments such as the VAMIL and EIA schemes, and in particular the REB tax scheme, combined with the introduction of the Green Funding scheme, would solve the problems with the financing of projects and contributed to the implementation capacity of NIWPs. Nevertheless, the performance of NIWPs in this intermediate period remained limited. The effects of the increase in implementation capacity became visible only in the third market period. The switchover to the new fiscal system also brought about a new independent wind power producer. This company, Groenraedt, adopted a whole new perspective on wind power exploitation.

Several banks anticipated the implementation of the Green Funding scheme early 1996 (see appendix 3.2) and created Wind Funds at the end of 1995[20]. These funds were created from the savings of private individuals (and companies), who were exempted from income tax on the interest received. The abundance and the popularity of the Green Funds and the increase in profitability of the wind projects caused a shift to project finance. The required financial contribution of wind power project developers to the total investment costs was reduced, and turbines and the wind power purchase contract were accepted as collaterals (Dinica 2003: 469). It mitigated the financing problems for NIWPs and contributed to the implementation capacity for this entrepreneurial group.

An interesting NIWP, Groenraedt, started its activities in 1996[21]. The company is a type 2-NIWP. The founder was a tax specialist, who owned a company in the area of financial services. This person had no technical background and employed a pure financial approach to wind power exploitation. Based on opportunities provided by the fiscal system, Groenraedt started developing wind power projects. The turbines that were fully licensed by the end of the year were bundled in one project and sold to individual investors, all high-income earners[22]. These investors could offset their marginal income taxes with the wind power investment. The application of this new participative investment approach was prompted by possibilities offered by the new fiscal system and led to a maximum net profit[23]. The approach was adopted from NIWPs in Germany and customised to the Dutch fiscal system. In the Netherlands, it was a new and unique strategy.

Because only a few NIWPs were active on the wind power market in these years, competition among NIWPs on the operational level of implementation was not really a problem. Moreover, the company profited from the positive institutional regulatory and social developments in the province where it begun (Flevoland). The first project was sold at the end of 1997. It was a solitary wind turbine of 600 kW in the municipality of Zeewolde. The project required the participation of 30 to 40 investors. Each partaking had to be sold on the basis of trust: Groenraedt had no reference. The founder of Groenraedt sold all shares personally[24].

Comparing the three NIWPs that were already active in the first period, on the number of turbines and projects installed in this intermediate period, we notice that especially E-Connection performed well. This NIWP owns a share of 56% of total capacity installed by this entrepreneurial group in this period; WEOM owns 23%[25] and De Wolff 15%.

Most projects installed by E-Connection were joint ventures with the energy distributor Delta in the province of Zeeland, the wind turbine manufacturer Lagerwey and/or Triodos Ventures. The strategy of developing wind power projects in joint ownership with an energy distributor fitted with national social and institutional conditions as valid in the previous period that continued to exist[26]. Collaborating with an energy distributor brought along access to the MAP-subsidies, which could contribute up to 25% of investments costs. Energy distributors decided on the distribution of these subsidies, which gave them a central position in financial support. It was also easier to agree on a payback tariff, when the energy distributor was co-owner of a project.

De Wolff-Nordtank increased the sales of wind turbines on the utilities and agricultural market in this intermediate period. In 1997, Nordtank and Micon merged into a new manufacturer Negmicon; a company which became quoted on the stock exchange. De Wolff and Micon-

Windkracht, the Dutch department of the Danish manufacturer Micon, tried to establish a Negmicon-Netherlands, but this attempt to collaborate ended in 1998. De Wolff about this decision: *´We, as a family company, did not fancy the idea of being a section of a large bureaucratically company quoted on the stock exchange. We decided to go on as an independent wind power project developer´.*[27]

In general, the total capacity owned by NIWPs remained limited compared to energy distributors and small private investors. Their limited number can explain this at large. This, however, was just about to change. The newly created favourable investment climate, in combination with the future free market, paved the way for the emergence of a new group of NIWPs during the third market period.

7.6 Free market (1998-2002)

During this period, national institutional conditions improved for NIWPs as for small private investors. The major institutional changes, which contributed to the implementation capacity for NIWPs, were (1) the liberalisation of the wholesale market and accompanying rules for grid connection, (2) the greening of the fiscal system and the introduction of market compatible financial instruments, (3) the liberalisation of the green consumer market and (4) the demand for clustering. These national institutional changes caused the emergence of a heterogeneous group of NIWPs, including both one-person and large companies. These new market players emerged in a rather turbulent period, characterised by a very profitable but insecure investment climate. Moreover, the entrance on the market of these new market players introduced a more competitive setting and an increase in institutional regulatory and social problems at the local level. The most successful NIWPs in this period were companies that were already active in the first and second market period (see figures 7.1 and 7.2). In addressing their performance, we will illustrate that these companies diverged in their strategies, which brought about some conflicts in the already fragmented wind power supply branch.

The 1998 Electricity Act, which created the legal framework for the liberalisation of the wholesale market, was the most important institutional change in this period. It caused the disintegration of the monopoly powers of energy distributors and it regulated the guaranteed and immediate access to the grid. In chapter 5 (section 5.6), we explained that it took some years of lobbying to repair the initial shortcomings in the rules for grid connection and the implementation of these rules. PAWEX[28] had a central role in affecting the policy making process with regard to these rules. The company E-Connection, one of the founders of PAWEX, was closely involved in this process and in the litigations of PAWEX against the independent Office of Energy Regulation (*Directie toezicht elektriciteit Dte*)[29]. The final results, the fixed tariffs since 2000 and the formal deadline for grid connection since 2004, contributed to the implementation capacity for all private investors and thus for NIWPs.

A second very important institutional change for NIWPs was the greening of the fiscal system and the introduction of market compatible financial instruments. NIWPs were able to make full use of the fiscal support schemes (the EIA and VAMIL schemes) as introduced in the previous

period, and profited from the increase in REB tax between 1999 and 2002 (see appendices 3.2 and 3.3). In addition, payback tariffs gradually improved due to the introduction of the Green Label system in 1998 and the replacement of this system by the green certificate system in 2001.

In the former chapter we saw that the transition to the green certificate system caused dissension between small private investors and energy distributors about contractual payback tariffs of existing projects. For most NIWPs, this was not the case, since they had no projects installed yet. The transition was only problematic for the few early NIWPs that had been active in the first and second market period. Some energy distributors went to court to obtain clarity about the interpretation of the payback tariffs in view of the new green certificate system. They won these lawsuits (Paardekooper, 2002)[30]. Nevertheless, the profitability of new projects increased considerably for NIWPs, which added to their implementation capacity.

The third institutional change was the liberalisation of the green consumer market in 2001. Like for small private investors, the liberalisation of the green consumer market brought about some advantages and some disadvantages for NIWPs. The unlevelled playing field that followed from the liberalisation of the green consumer market and the REB tax exemption for foreign green electricity, created a market based on cheap supply by imports. This negatively affected the implementation capacity of domestic wind power entrepreneurs. This negative effect was nullified, however, by the emergence of a large consumer demand, which increased the pressure on the market green electricity market. Due to the large consumer market, all energy distributors were eager to purchase green electricity. The overall effect was positive. The implementation capacity increased for NIWPs, despite the unlevelled playing field.

The liberalisation of the wholesale market, the increased profitability of projects, and the large customer demand caused the emergence of about 15 NIWPs around the turn of the century. These included both one-person companies and large companies like holding companies with contracting work as their core business. For the first time a few companies emerged with no connection to the electricity sector whatsoever (type 3). Moreover, the share of companies, who following from their own core-business saw a new business opportunity in wind power exploitation, increased (type 2). They all hoped to profit from the favourable fiscal incentive system. However, this system once again changed as a sudden in 2002.

At the end of that year, the Dutch government corrected an important deficiency of the fiscal system (REB tax revenues flying abroad without stimulating new domestic green production capacity[31]). The government announced that the exemption from the REB tax for renewable electricity would be reduced by 50% and the generic feed-in tariff of 2 €ct/kWh known as the REB energy tax Article 360 would be abolished. Simultaneously, the EIA and VAMIL schemes had been suspended in October 2002, because of an overrun of the budget. These sudden changes in institutional conditions caused a shock in the market. For almost half a year, the financing and building of projects that were fully licensed became impossible, and only started again after the revival of the EIA scheme in January 2003 and the implementation of the new 'Environmental Quality of Electricity Production' (MEP) feed in tariffs in July 2003. The implementation of this new MEP feed in tariffs system was accompanied by uncertainty, unfamiliarity and many initial shortcomings (Guldie & Kortenoever, 2003; Kortenoever, Jansen, & Schuur ter, 2004; Kortenoever & Schuur ter, 2004)[32]. *'These changes and the lack of clarity about the new system, we thought it might finish us*[33]*'*.

The changes in institutional conditions affected all types of wind power entrepreneurs in the Netherlands. However, compared to the other entrepreneurial groups, it especially stroke NIWPs. They were the only market players for which wind power exploitation was (part of) the core-business.

The emergence of many new market players led to a situation of increased competition. However, with payback tariffs largely determined by the REB (and later the MEP tariffs) competition on kWh prices hardly occurred: these prices were to a large degree determined by governmental financial support. Conversely, on the operational level of implementation competition increased. This increase in competition was additionally stimulated by the final important institutional change in this period: the demand for clustering turbines. As solitary installations were no longer allowed in most of the Dutch provinces, different entrepreneurs were more frequently competing for the same location. Projects not only got more complex because more landowners were involved, increased competition also caused an increase in prices for the land and to conflict situations. *'We met the same developers on the same locations. All were prepared to fetch a high price for the land in order to develop the project',* and '*An angry competitor complained that we pilfered the location right under their nose. We took it as a complement'*[34].

In addition, lead-times for project development increased. Following the release of the Action Programme for Renewable Energy and the establishment of the Project Office for Renewable Energy (1997), more than 100 municipal potential studies were conducted under the authority of the Ministry of Economic Affairs. These studies indicated possible locations for wind power generation within a municipality, and were used by NIWPs to initiate projects. Many municipalities were confronted with different initiatives at the same time and started, as a reaction, a municipal policy making processes on wind power. These local policy making processes, which included the informal local political debate on the necessity and possibility of wind power[35], could take years. During these processes of continuous deliberation, securing sites and permits was not possible. The consequently increase in lead-times and the insecurity due to the dynamic and inconsistent social and institutional setting necessitated the capacity to hold out long lead-times. *'Initiatives fail because developers don't have enough time and money to go through the whole planning and permitting processes'*[36].

To spread the risks NIWPs initiated a portfolio of projects, which, in turn, additionally intensified the competition for locations. These social constraints on the operational level of implementation hampered the implementation capacity of NIWPs. The more professional and wealthy competitors on the market seemed better equipped for this new situation of increased competition and long lasting local level policy making processes.

Now that we have addressed the emergence and the performance of NIWPs in general, we will focus on some NIWPs separately. Figure 7.2 shows that the NIWPs that were active already in the first market period performed best. This was to be expected, since new entrants to the market had no projects in the pipeline as they started, combined with the increase in lead-times in this third market period. Looking at the performance of the early NIWPs, we notice that Groenraedt owns a share of 19.5% of total capacity installed by this entrepreneurial group in this period; De Wolff owns 17.3 %, E-Connection owns 11% and WEOM 8.5%.

Groenraedt's participative investment approach turned out to be quite successful. The high-expected rate of return on participation (12.3% to 144%) attracted many private investors: almost 4000 high-income earners were participating in 14 projects with in total 58 turbines by the year 2004[37].

The company grew rather quickly and evolved in a holding company with specialised divisions[38], active in the whole of the Netherlands. Two former farmers were responsible for acquiring locations, mainly agricultural locations, also in areas where nothing was possible from a local institutional regulatory and social point of view.

The company developed its activities in relative isolation of the wind power branch. It became a member of PAWEX, but was never actively involved in this association. Groenraedt was rather unknown: *'Nobody knew Groenraedt; the company built wind turbines, but nobody knew the locations and numbers. Rumours often were rather negative*[39]*'*.

In 2004, a huge conflict arose when a committee member of the Dutch Wind Energy Association (NEWIN) together with a member of Dutch Parliament in a nationwide daily newspaper and in a current affairs television programme accused Groenraedt of misusing governmental incentive schemes[40] (Het Financieele Dagblad, 2004a). The 'Groenraedt participative investment approach' created wind power projects, which were twice as expensive as prevalent[41]. The committee member of NEWIN (director of competitor Evelop): *'I am worried about the 'method-Groenraedt'. It is very creative, but passes the boundaries of ethical entrepreneurship'(Energeia Energienieuws, 2004a)*. Groenraedt reacted by starting a legal proceeding against Evelop and by demanding a withdrawal of the imputations. The company stated that it sold each wind power project for a commercial price to a self-established partnership. Indirect overheads of other wind power projects (according to Groenraedt, 85% of all projects failed to be implemented) were included in the calculations of the prices. Consequently prices were high. The judge decided in Groenraedt's favour and demanded a rectification on the front page of the nationwide daily newspaper (Energeia Energienieuws, 2004b, 2004c; Het Financieele Dagblad, 2004b, 2004c). The affair brought along negative publicity for wind energy in general and caused strained relations within the already fragmented wind power branch. The negative publicity negatively affected the implementation capacity for wind power entrepreneurs in general and in particular for NIWPs. In addition, questions in Dutch Parliament about the apparent misuse of the EIA scheme led to an adaptation of this scheme as from 2005: the EIA would be levelled down to a maximum of subsidy per kW installed (Energie Verslag Nederland, 2004; State Secretary of Finance, 2004). An interesting remark with regard to this affair is that Evelop later would adopt the participative investment approach. Evelop applied the approach to finance a wind power project (two 2.5 MW wind turbines) in 2005[42].

The second NIWP, De Wolff, went on as a project developer, independent of the wind turbine manufacturer Negmicon. De Wolff, just as Groenraedt, focused on agricultural locations for project development. Contrary to Groenraedt, De Wolff mainly worked as a consultant for farmers. Only 20% of the projects were developed at the own expenses and for own exploitation[43].

Driven by the experiences as owner and operator of turbines, the company concentrated on creating a total package for its customers. Through the collaboration with Nordtank, De Wolff had been able to build up expert knowledge on the operation and maintenance of turbines. This enabled De Wolff to offer after sale services and maintenance for its customers. In addition,

it started a digital newsletter and a helpdesk to provide assistance with the many changes in the financial incentive system. '*We offer everything that the regional associations of wind turbine owners can offer, but in a more professional manner*[44]'. With the involvement in the implementation of 246 turbines or 203 MW by the end of 2004 (about 17.5% of total capacity installed in the Netherlands), De Wolff had a substantial reference list, which added to the implementation capacity of the company (De Wolff, 2005).

Like Groenraedt, De Wolff developed its activities in relative isolation of the wind power branch. '*We are not actively participating in the network. We are a member of PAWEX and NEWIN, just to keep our self-posted, but we don't aspire after an executive function. It takes too much time, too much botheration, it yields little*[45]'.

The third and fourth NIWPs in this period, E-Connection and WEOM, both changed focus. E-Connection decided to set out a new course after having contributed to a feasibility study for offshore wind energy by government order in 1997[46]. The company changed focus from onshore to offshore wind power project development (see also next section)[47]. Consequently, onshore implementation by E-Connection dropped since the year 2000.

WEOM, in this period, mainly worked as a consultant for third parties, especially energy distributors. The company did not focus on solitary locations and never worked under the authority of farmers (only if joint ownership was an option). Own initiatives remained limited: only three projects were implemented at the own expense. Uncertainty about continuation of the REB tax and unfamiliarity and distrust about the new MEP feed in tariffs system caused WEOM to set out a new course of developing wind power projects abroad. The company was able to materialise this new strategy as soon as it was taken over by energy distributor Nuon in the year 2000[48]. By developing wind power projects abroad (Germany, France and Ireland) and devoting less energy to expand onshore wind power projects in the Netherlands[49] the implementation capacity of WEOM declined. Moreover, WEOM also started developing offshore wind power activities in this third market period. The company worked as a consultant for the consortium Noordzeewind (an alliance between Shell and energy distributor Nuon).

7.7 Offshore wind power generation

Before we step to the conclusions, this section briefly addresses developments with regard to the offshore wind power industry and supply market in the Netherlands. The technical potential of wind offshore on the Dutch continental shelf, including the area within the near shore zone, is estimated to be between 10-56 GW. However, within the near-shore 12-mile zone, the Dutch national government has already decided that only one 100 MW_e experimental park will be built[50](Junginger et al., 2004). With regard to the area outside the 12-mile zone, the Dutch government pointed out some preferential areas, where future parks ought to be built. An interdepartmental commission worked at a concession system for these preferential areas. This policy making process at the national level with respect to the institutional framework for offshore wind power blocked the implementation capacity for offshore wind power entrepreneurs for years.

The first target of 3000 MW offshore wind, set in the Third White Paper on Energy in 1996, started the policy making process at the national governmental level[51]. After some studies on the feasibility of offshore wind power generation by government order (1997 and 1998), the new independent wind power producer E-Connection applied for a permit to build a 120 MW offshore wind power plant in the quadrant Q7 of the Noordzee. This Q7-project would become an exceptional case: until recently, it was the only offshore wind power project fully licensed in the Netherlands[52]. Other applications, applied for by several market players in 2001, were refused on the basis of a newly established moratorium announced in the Fifth National Policy document on Spatial Planning by the ministry of Housing, Spatial Planning and Environment (2001). The government aimed to create a new law for the assignment of permits for offshore wind projects. This law had to provide for a firm governmental grip on offshore wind power developments. Only for the Q7-project, an exception was made: refusal of this application was not possible because an Environmental Impact Assessment had already been completed for this project at the time that the moratorium was established.

An interdepartmental commission[23] started working at a concession system for the preferential areas as assigned in the Fifth National Policy document on Spatial Planning (2001). This new legal system ought to be used to grant locations to potential investors and to make initiatives comply with certain quality requirements. No permits would be issued until such time as this system was ready.

Offshore market players and Dutch parliament were not in favour of creating a new legal system for the permitting of offshore wind energy. They were of the opinion that existing legislation (the Waterways and Public Works Act) provided sufficient legal base to permit offshore wind power projects. Nevertheless, the interdepartmental commission held on to creating a new legal framework: a concession system with the possibility to pre-select market initiatives preceding the applications for permits. At several moments during this process of creating a new legal framework, the commission actively consulted offshore market players (the ones that applied for a permit in 2001).

In 2004, the new concession system was sent for approval to the Council of State, which, however, advised negatively on the bill. As of that moment, after four years of discussions with the market and with Dutch parliament, the government decided to give up the idea of creating a new concession system, and decided to apply the Waterways and Public Works Act for permitting offshore wind power projects.

The lack of an operational institutional structure for many years brought the Dutch offshore energy supply market to stand still: it had been impossible to apply for a permit up to 2004. Consequently, the implementation capacity was zero.

7.8 Reflection on the main findings

The chapter started with describing different types of NIWPs, followed by a description of their market performance. The majority of NIWPs are new companies that had their roots in the (renewable) energy sector or existing companies that following their own core-business saw

a new business opportunity in wind power project development. A clear economic rationality characterises this entrepreneurial group: economic arguments are decisive in their origin and strategies. Striking features of their market performance are the minor position on the market in terms of capacity installed during the 1990s, followed by an increase in importance in since the year 2000. This shift in performance corresponds to the limited number of NIWPs unto the end of the 1990s, followed by the emergence onto the market of a rather heterogeneous group NIWPs in the third market period. In this chapter, these features were related to changing social and institutional conditions.

National social and institutional conditions were far from ideal for NIWPs at the beginning of the 1990s. NIPWs found themselves in a peculiar market position of being chained to the regional energy distributor, who decided on the assignment of the SAR and the MAP-subsidies (SAR and MAP together constituted the payback tariffs for wind power). This monopolistic situation implied a rather weak implementation capacity for private producers. Moreover, problems with the financing and insuring of projects additionally hampered the implementation capacity for NIWPs. As a rule, this constellation of social and institutional conditions did not motivate commercial investors to enter the wind power supply market in this period. Three NIWPs were an exemption to this rule. Their emergence on the wind power supply market can be explained by specific social conditions (strategies) at company level, related to some specific changes in national social or institutional conditions (such as the establishment and breakdown of Windplan). Specific interests, such as the steel construction of the masts for a steel-company, and an attempt to compensate for a decrease in turbine orders for a wind turbine manufacturer, were decisive in their origin.

The switchover to a new fiscal incentive system in the middle of the 1990s added to the implementation capacity of NIWPs, although some unfavourable institutional conditions (SAR and MAP) of the previous period continued to impede the possibilities for private producers. Due to the new fiscal system, problems with the financing of projects were solved and a new company emerged. The company adopted an entirely new financial perspective on wind power exploitation. The emergence of this NIWP can be fully explained by possibilities created by changes in national institutional conditions, i.e. by the greening of the fiscal system. However, these new possibilities, and the increased profitability of projects, were insufficient conditions to boost the market as whole. The emergence of a competitive group of NIWPs only took place after the liberalisation of the market at the end of the 1990s, which removed the final institutional thresholds at the national level.

Overlooking the third market period, we notice two contrary developments. Major institutional changes at national level, such as liberalisation of the wholesale market and accompanying rules for grid connection, the greening of the fiscal system and the liberalisation of the green consumer market, considerably added to the implementation capacity of NIWPs, which caused the emergence of a heterogeneous group of new companies. Simultaneously, increased competition and social constraints on the operational level of implementation led to an increase in lead-times and hampered the implementation capacity for these new entrants. The increased competitive setting, and strategic entrepreneurial behaviour, brought about conflicting situations within this entrepreneurial group, that (compared to the other entrepreneurial groups) emerged

rather late onto the market. These conflicting situations, both on the national level (conflict about the apparent misuse of incentive schemes) and the operational level of implementation (competition for sites) hampered the implementation capacity for this entrepreneurial group as a whole. Nevertheless, the driving forces of positive institutional conditions on national level were strong enough to increase the relative performance of this entrepreneurial group to a considerable extent. In general, the implementation capacity improved for this type of wind power entrepreneur, and their market share of 39% in 2004, a record year, is in accordance with this.

This success in terms of the number of turbines and capacity installed must be ascribed to a limited number of market players. These market players were professional entrepreneurs who strategically sought opportunities as provided by the changing constellation of social and institutional conditions. This strategic application of the rules brought about some conflicts within this young entrepreneurial group, which caused negative publicity about the costs for wind power generation in general. The two most successful NIWPs were companies that were already active in the previous market periods. Although these NIWPs employed totally different financing strategies, they both focused on agricultural locations for project initiatives, and they both worked in relative isolation from the wind power and (renewable) electricity branch.

Is it fair to conclude that a real market has come into being in the third market period? A free market implies greater competition for companies, if the market functions properly, with few barriers for new entrants. Overlooking the development of the onshore wind power supply market, we observe that competition on the operational level of implementation increased with the emergence of NIWPs. While energy distributors for long stuck to their originally monopoly of supply areas, small private investors only established wind turbines on their own land, and wind cooperatives mutually agreed on the working area of each cooperative, were NIWPs the first entrepreneurs who competed on this aspect. NIWPs, moreover, showed more fierce competitive and strategic behaviour. These companies, for instance, tried to spread risks by initiating a portfolio of projects or by shifting focus to wind power project development abroad and offshore. On the other hand, the market and the initiatives fully depended on the availability of governmental financial incentive schemes, and competition on kWh prices hardly occurred due to existence of these schemes. Moreover, the increased problems on the operational level of implementation and the long-lead times as a result were important barriers for new entrants. New companies need sufficient resources to hold out long-lead times. This makes the onshore wind power market less attractive for newcomers.

A final remark regards the temporary character of the implementation capacity. This chapter once again shows that positive national social and institutional conditions must be complemented with entrepreneurial capacities, such expertise and financial resources, and positive local capacities, such as a cooperative approach by local authorities. In the next chapter, we will focus on these local conditions.

Notes

1 Parts of this chapter are taken from an article published in Energy Policy © 2004 (Agterbosch, Vermeulen & Glasbergen, 2004).

2 Wind power exploitation is a (new) part of their core-business.

3 MEA was an early consultant in the area of Environment, Energy and Waste.

4 WinWind, for instance, has implemented a 10 MW wind power project in joint ownership with the energy distributor Delta in the province of Zuid Holland in 2005 and a 22 MW project in the province of Zeeland in 2006 (WSH, 2005/2006). Koop Duurzame Energie BV (a 100% daughter company within Koop Holding) and energy distributor Essent established a joint venture Milenergy. Milenergy implemented 6 turbines (12 MW) in the municipality Delfzijl in the province of Groningen. These turbines are of a 45 MW project. This project started in 1997, the remaining 32 MW still need to be implemented (Wind Service Holland 2005/2006).

5 These companies or institutes are Lagerwey, Nedwind, Micon, Vestas, General Electrics, Siemens and the ECN-Wind Turbine Test Site. Together, they have a market share of 8.5% of total capacity installed by NIWPs and a market share of 1.9% of total capacity installed in the Netherlands up to 2004 (KEMA 2002/2003, Wind Service Holland 2003/2004).

6 In the third market period, the NIWP Wind Groep Holland established wind turbines in collaboration with energy distributor Nuon. The NIWP Koop Duurzame Energie established a joint venture with energy distributor Essent. This joint venture Milenergy develops some large-scale initiatives in the province of Groningen (this province originally was the monopoly of supply area of Essent). These initiatives still have to be realised (the operational process of implementation started in 1998).

7 The first initiative of the centre in 1978 was to elaborate an alternative, green energy scenario for the Netherlands.

8 Kortenoever, M. Email communication 14 February 2006.

9 The first two wind turbines were connected to the grid in November 1989. A relatively large-scale project consisting of six turbines or 1.5 MW followed in December 1989. This latter project in the province of Noord Holland was sold to the energy distributor PEN, who would use it as part of the Windplan target.

10 One of the co-owners of E-Connection was a former employee of PGEM, hence communication lines were short.

11 The Ministry of Economic Affairs granted an investment subsidy to Windplan, provided that it would purchase a large number of the turbines from Dutch manufacturers. Only a small share of 5 MW would be contracted out to foreign manufacturers. Wolff de, C. Personal communication 8 March 2005.

12 Wolff de, C. (Director De Wolff) Personal communication 8 March 2005

13 Wolff de, C. (Director De Wolff) Personal communication 8 March 2005.

14 At the beginning of the 1990s, there were three Dutch manufacturers: Lagerwey, Nedwind and Windmaster.

15 De Wolff was lucky to receive a building permit for 11 wind turbine at a location nearby one of the locations of Nuon. It enabled De Wolff to combine the projects and to offer turbines at a very competitive price.

16 Loans were given by the Rabobank for 10 years debt maturity at interest rates of 7-8% on average (Dinica 2003: 467).

17 The level of MAP investment subsidies were up to 25% of investment costs, which especially favoured energy distributors.

18 Wolff de, C. (Director De Wolff) Personal communication 8 March 2005

19 Concerning the meaning of 'the most stimulating compensation' for renewable electricity as defined in the 1989 Electricity Act (see chapter 5, section 5.4).

20 In early 1996, the following banks had Green Funds: Triodos, ASN, ING Bank, Rabobank, Credit Lyonaiss and Mees Pierson (Etsu 1996 in Dinica 2003: 469).

21 Although project development started in 1996, Groenraedt as a company was set up officially in February 1997.

22 Projects were financed with a high proportion of equity capital and a bank loan. The individual investors formed a Limited Partnership, which formally owned the project. After five years of operation, Groenreadt repurchased the wind power projects.

23 The return on participation in the 1997-project was 16.4% ((Raedthuys & Partners B.V., 2003)).

24 Vermeulen, A. (Director Groenraedt) 11 March 2005.

25 One project of 2.5 MW consisting of 5 wind turbines in the province of Zuid Holland.

26 The unfavourable national institutional conditions (SAR and MAP) of the previous period still existed

27 Wolff de, C. (Director De Wolff) Personal communication 8 March 2005

28 In cooperation with the other representative associations, which since 2002 cooperated in the so-called Windkoepel (see section 3.5.2).

29 Based on judgment LJN: AE 8313, College van Beroep voor het bedrijfsleven, AWN 00/681and 00/682.

30 Based on judgment LJN: AB2747, Rechtbank Utrecht, 132389/KGZA 01-669/BA.

31 See chapter 3, section 3.5.1 for an explanation of this deficiency.

32 The payment of the MEP was postponed and considerably delayed due to initial shortcomings in rules and the implementation of these rules. A major problem was that grid operators exceeded the term for submitting data about kWh produced by wind turbines. As a result, the new organisation 'CertiQ' was unable to pay 'Guarantees of Origin' (green certificates). On the basis of these 'Guarantees of Origin', the MEP had to be paid. Another problem was the lack of clarity about continuance of the MEP in case of a transfer of ownership of a project, which was required to finance the project. Also disputes about the height of the MEP were problematic.

33 Anonymous (Employee WEOM) Personal communication 15 February 2006.

34 Both quotations are based on Borch van der, R.A.D. (Employee Econcern) Personal communication 23 September 2002, Wolff de C. (Director De Wolff) Personal communication 8 March 2005 and Vermeulen, A. (Director Groenraedt) Personal communication 11 March 2005.

35 It is not advisable to apply for permits if the municipal land use plan (MLUP) does not indicate areas for wind turbines: the permits will be denied because the MLUP is not providing for wind power (see section 3.6.1).

36 Based on Steege van der, A. (Employee WEOM) 21 June 2002 and Borch van der, R.A.D. (Employee Econcern) Personal communication 23 September 2002.

37 The expected return on participation in the projects that were realised in the period 1998-2004 varies between 12.3% and 144%: (Raedthuys & Partners B.V., 2003)

38 Groenraedt BV developes wind power projects, Groenraedt Projecten BV operates the projects, Raedthuys & Partners provides for the financing of the projects, Paulowski, Muller & Partners is a specialist in insurances and Raedthuys Energie BV is an energy trading company, which sells wind power on the electricity market. Paulowski, Muller & Partners is a 50% joint venture with the German Paulowski, Muller & Partners, which is one of the biggest wind turbine insurers (Vermeulen, A. Personal communication 11 March 2005).

39 Vermeulen, A. (Director Groenraedt) Personal communication 11 March 2005.

40 Television programme NOVA, Den Haag Vandaag 8 June 2004.

41 Groenraedt maximised the use of the EIA scheme by selling projects to self-established partnerships of private high-income earners. These private investors could offset their income taxes for a 52% tariff with these wind power investments. This, together with the REB tax exemption and the MEP feed-inn tariffs brings the

total amount of subsidy to € 23 million for a project of 15 MW (total investment 28.3 million). A common rule of the thumb is 1.125 million per MW for onshore wind power projects (Energeia Energienieuws, 2004a).

42 The expected return on participation in this project was 9.3%, dependent on the tax bracket.

43 Wolff de C. (Director De Wolff) Personal communication 8 March 2005.

44 See footnote 43.

45 See footnote 43.

46 A feasibility study for a 100 MW experimental wind power project within the 12-mile zone was carried out, within the framework of the research and subsidy programme TWIN II (1996-2000).

47 In 1997, E-Connection sold 9 wind power projects in the UK to British companies to reserve human capacity and resources for offshore developments (Kortenoever, M. (Director E-Connection) Email communication 14 February 2006.

48 In 2000, WEOM became a 100% daughter company of energy distributor Nuon.

49 Steege van der, A. (Employee WEOM) 21 June 2002 and Anonymous (Employee WEOM) Personal communication 15 February 2006.

50 As a pilot project for the exploitation of offshore wind power plants, the Dutch government has taken the initiative for a 100 MW wind farm off the coast at Egmond aan Zee. After a tender procedure, the consortium NoordzeeWind, an alliance between Shell and energy company Nuon, was regarded as most qualified to build the farm.

51 New targets were set in the course of the years. In the 2001 Energy Report, an official policy goal was formulated of 6000 MW offshore in 2020 (Ministry of Economic Affairs, 2001).

52 Q7 is a 120 MW offshore project initiated by an alliance led by a new independent wind power producer E-Connection Project BV, which was fully licensed on 18 February 2002.

53 Three ministries were represented in this commission: Ministry of Economic Affairs, Ministry of Housing, Spatial Planning and Environment and the Ministry of Transport, Public Works and Water Management. A fourth ministry, the Ministry of Agriculture, Nature Conservation and Fisheries, became involved in 2003, when the preferential locations were abolished (Hulst van der, 2004: 66).

8 Perceptions of wind power entrepreneurs and local civil servants of social and institutional conditions in realising wind power projects

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8.1 Introduction

Substantial changes, such as the liberalisation of the electricity sector and the introduction of new policies to stimulate renewable electricity generation, characterise the electricity policy field in the Netherlands over the last decade. The Ministry of Economic Affairs has been the dominant player with regard to these national level changes in policy. The former chapters illustrated that the shaping of policies and planning of the electricity sector at the national level has affected the development of the wind power supply market. New wind power entrepreneurs emerged and shifts occurred in market shares of different entrepreneurial groups. However, we also saw that wind power entrepreneurs come across a multitude of institutional conditions when fulfilling activities that are required for the implementation of wind turbines, such as spatial planning, permitting activities, grid connection and selling electricity on the power supply market. Not only national level strategic electricity policies and instruments, which are developed to stimulate wind power production, are relevant for wind power implementation, but also policies and instruments in other fields such as land use policy and law, environmental policy and law and nature conservation policy and law. These policies and instruments from different policy fields converge on the operational level of implementation, and constitute the institutional framework in which wind power entrepreneurs and other stakeholders involved in wind power implementation operate. Securing sites and permits for wind turbines are conceived to be main challenges for wind power market development (IEA, 2004; Ministry of Economic Affairs et al., 2004).

This chapter aims to explore these challenges. We analysed perceptions of wind power entrepreneurs and local civil servants about their experience with social and institutional conditions in the operational process of wind power implementation, and their perceptions of policy implications. We conducted workshops in an Electronic Board Room to analyse the perceptions and to generate new ideas for future wind power policy. The workshops covered the degree to which social and institutional conditions in the operational process of wind power

implementation affected the development of the market. The workshops furthermore served to reveal different perceptions between wind power entrepreneurs and local governmental authorities.

From the analysis it was concluded that the entrepreneurial groups and local civil servants share the opinion that the institutionally embedded power position of local politicians and the sensitiveness of the local political debate for the popular opinion are most critical for project realisation. With regard to the proposed solutions, both groups differ in their approach. Entrepreneurs stress procedural solutions, such as limiting the possibilities to appeal, reducing the complexity of the formal authorisation trajectory and using a top down planning approach. Civil servants stress more strategic solutions, such as providing more public information on the necessity of wind power for local politicians and citizens, and community involvement in planning processes. Finally, the analysis explains that steering strategies that have been developed at the national level to solve planning problems at the local level do not address the right problems.

8.2 The Electronic Board Room

An Electronic Board Room (EBR) (hardware) with a Group Support System (GSS) (software) is an interactive, computer-based system that facilitates participants to communicate on unstructured and semi-structured problems. Dependent on the character and aim of a workshop, communication is directed at problem analysis, brainstorming, decision making or data gathering. A system of linked computers allows participants to provide input anonymously by giving examples and by voting on statements. Advantages of a GSS in an EBR are the anonymity of participants and the possibility of providing input simultaneously. The advantage of anonymity is that ideas will be assessed independent of the particular person that provided the idea. The advantage of providing input simultaneously is that 'speaking time' of each participant is widened. A GSS sees to a comparable contribution of dominant and silent participants (Bongers, 2000).

A GSS can contribute to the analysis of complex problems and to consultation between different actors involved in the problem. Both aspects are complementary. Generally speaking, a GSS may positively affect the following aspects of problem analysis (Herik van de, 1998; Vreede & Krans, 2001: 70-77):

- GSS increases insight in the complexity of a problem: the involvement of different actors can lead to a clustering of information and insights, that together have a surplus value;
- GSS enables testing and evaluating: a group of stakeholders is, compared to individuals, in a better position to assess results or solutions for a problem on the sense of reality;
- GSS increases acceptance: involvement of a variety of interests may broaden the insight in the needs and point of views of different participants; which may contribute to the acceptance of solutions;
- GSS stimulates synergy and creativity; the involvement of different interests in the analysis of a problem can stimulate creativity because participants build on ideas from each other; using insights and knowledge from different angles.

However, using a GSS in a fruitful way requires awareness of the following practical points:

- Though practise shows that participants, irrespective of their experience with computers, are able to work with the system within 20 minutes, participants need some experience with computers;
- The workshops are very intensive for participants. Sufficient variety in tools and regular breaks are a necessity;
- The workshops may deliver such a large amount of information, that participants risk to lose track of the situation;
- The electronic way of communicating offers limited possibilities for participants to get acquainted with each other and for informal bilateral deliberation.

Broadly speaking, applications of GSS in research can be divided in two categories: GSS as a research object and GSS as a tool for research (Bongers, Wiering, Glasbergen, & Smits, 2001). In our study we used the GSS to discuss the importance of social and institutional conditions in the operational process of realising wind power and to vote on statements on the importance of these conditions. We, thus, used the GSS as a tool to study a complex societal phenomenon, i.e. wind power implementation.

8.3 Workshops to analyse perceptions

We organised two workshops with different types of entrepreneurs and one workshop with civil servants from provincial and local authorities. We invited 55 entrepreneurs, evenly divided over the four different entrepreneurial groups. In total 27 entrepreneurs registered for participation[1]. We also invited 57 provincial or local level civil servants[2]. The signs of interest amid civil servants were limited. Only 3 civil servants had registered for participation after the term of registration went by. Contacting the others by telephone finally led to 12 participants. These telephone conversations provided insight in the considerations about participation (see table 8.1): 12 civil servant (27%) were prepared to participate, 8 (17%) were interested but unable to participate at the

Table 8.1 Considerations about participation of civil servants who were invited for a workshop

Considerations about participation		Provincial civil servants	Local civil servants
Interested/prepared to participate		1 (8%)	11 (24%)
Interested/not at the particular date		2 (17%)	8 (18%)
Wind energy is not a priority/no time available			2 (4%)
Research is not a priority/no time available		4 (33%)	
City council opposes wind power	Formal		3 (7%)
	Informal		7 (16%)
City council is not against wind power, but the topic is problematic and demands to much time already			2 (4%)
Civil servant has left/other job/is ill		2 (17%)	2 (4%)
Problem with the use of a electronic boardroom			1 (2%)
Civil servant cooperated with an other study recently			1 (2%)
Unknown		3 (25%)	1 (18%)
Total		12 (100%)	45 (100%)

particular date of the workshop, 12 civil servants (27%) indicated that they were not prepared to participate because the city council opposes wind power, or because '*wind power is a problematic topic that already takes too much time*'.

The workshops did not form a representative assessment, because the number of participants was necessarily limited. Nevertheless, the participants together have practical knowledge of a large number of wind power planning processes nationwide. The 27 entrepreneurs that participated have been involved in the majority of capacity installed in the Netherlands. We asked the participants to take their own practical experiences in wind power planning as a point of departure in their response on social and institutional conditions in the operational process of realising wind power. Reviewing this makes it reasonable to assume that the results of the workshops are representative for the experiences and perceptions of wind power entrepreneurs in the Netherlands. We cannot make this assumption for local civil servants. While the Netherlands is divided in 12 provinces and 500 municipalities, only 12 local and regional civil servants participated. By inviting civil servants from municipalities spread over the Netherlands, we tried to overcome the limited possibility to generalise. None of the provinces was over represented. In addition, we sent the results for comment to all civil servants who were interested but unable to participate at the particular date.

Though statistical generalisation is not possible, analytical generalisation is. The results can be generalised in qualitative terms. They provide information about experiences and perceptions of entrepreneurs and local civil servants with respect to social and institutional conditions in the operational process of realising wind power and about processes that underlie the relationships between these conditions. It may be argued that similar processes will take place under similar circumstances.

We asked participants to reflect on statements with respect to social and institutional conditions in this operational process. The statements were derived from results of a literature study, from stakeholder's analyses of wind power planning processes[3] and from results of surveys conducted amongst different types of entrepreneurs[4]. We propounded 15 statements on institutional conditions, and 15 statements on social conditions. As a special category of social conditions we propounded 10 statements on social resistance and the effects of social resistance.

The workshops involved systemic voting procedures on the following aspects:
- whether the participants recognised the statements as being general applicable,
- whether the participants saw the statements as being recognisable for their own situation as well,
- whether the participants were of the opinion that social and institutional conditions on the operational level of implementation influenced the development and composition of the market.

Besides voting, we asked each participant to provide practical examples of situations in which they experienced statements. In this way we aimed to gather a variety of empirical situations, which together would support or refute a statement. We also asked each participant to put the various statements on institutional conditions and social conditions in a ranking order of

importance with regard to project realisation and market development, thus revealing critical social and institutional conditions (see table 8.2)[5]. A brainstorm on solutions for critical social and institutional conditions was also part of the workshops.

GSS enabled us to improve and complement 'traditional' methods for data gathering, such as conducting a survey or carrying out interviews. An important advantage of GSS is that results are calculated and presented immediately, which made it possible to reflect with participants on voting results and on the ranking order of importance of social and institutional conditions. For those conditions that were perceived to be most critical for wind power implementation, a brainstorm was carried out on possible solutions. The system enabled us to use both quantitative tools (voting procedures and ranking order) and qualitative tools (providing empirical examples and brainstorm on solutions). In one session, we discussed and voted on statements, we provided feedback on the results and we carried out a brainstorm on solutions for critical social and institutional conditions.

Table 8.2 A selection of the statements by participants: critical social and institutional conditions for project development

Institutional conditions
An ambitious attitude of the municipal executives and the local civil service towards wind energy are necessities for wind power implementation.
The fragmented character of policies and instruments from different policy fields and different government levels is an important cause of delay in project development.
The insecurity of the financial support system leads to uncertainty with regard to the financial viability of projects.
Height restrictions lead to inefficient use of locations for wind power.
The administrative agreement BLOW added to regional and local administrative élan; it however does not improve local planning problems and possibilities for wind power entrepreneurs.
Social conditions
Sensitiveness of the local political attitude for the local popular opinion with regard to wind power.
Projects reach a deadlock on not formally recognised arguments in the local political debate.
Projects get highly delayed by appellants; but don't fail on formal grounds in the permitting procedures.
Lack of local scope and structure of knowledge with regard to wind power: limited administrative capacity.
Local entrepreneurs may depend on more administrative support, than 'foreign' entrepreneurs.
Social resistance
Social resistance arises from prevalence for the interest of the local landscape above the global environmental interest.
Resistance is not a widely supported phenomenon, but has its origin in a limited number of people.
Hearings on concrete locations stimulate social resistance.
Hearings on potential locations stimulate social resistance.
Participation of nearby citizens lessens social resistance.
Local entrepreneurs may depend on more social support, than 'foreign' entrepreneurs.

8.4 Wind power entrepreneurs framing social and institutional conditions

The perceptions of wind power entrepreneurs about the influence of social and institutional conditions in the operational process of realising wind power projects, can be divided in four coherent clusters regarding different aspects of the process. These clusters are derived from qualitative data (practical examples provided by the participants) and quantitative data (voting procedures and ranking order: see appendixes 8.1 and 8.2).

1. *The city council possesses a veto position in spatial planning. Simultaneously, local politics is experienced to be very sensitive for the local popular opinion. Projects reach a deadlock in consequence of the force of not formally recognised arguments in the local political debate. Entrepreneurs cannot bank on the decisiveness of formal standards in decision-making.*
2. *The quality of permitting is under pressure, due to the complex legal framework and limited administrative capacity. Implementation requires an ambitious local administrative attitude towards wind power.*
3. *The insecurity of the financial support system leads to uncertainty with regard to the financial viability of projects, but has not been a bottleneck for market development since the end of the 1990s.*
4. *Some institutional conditions, such as the dominance of fiscal arrangements, are experienced to be discriminating in the market. Simultaneously, all entrepreneurs indicate that these conditions are relatively unimportant for market development.*

In the following subsections we will elaborate on these four clusters. We will show that only the 'power position of local authorities and the force of not formally recognised arguments is experienced to be a bottleneck, which frequently leads to failures in implementation: local level politics blocks market development. The other categories of institutional and social conditions slow down but don't block project realisation. These conditions make implementation a difficult -but not impossible- undertaking. In the last subsection, we finish with a reflection on the solutions proposed by the entrepreneurs for the most critical social and institutional conditions.

1. *The city council possesses a veto position in spatial planning. Simultaneously, local politics is experienced to be very sensitive for the local popular opinion. Projects reach a deadlock in consequence of the force of not formally recognised arguments in the local political debate. Entrepreneurs cannot bank on the decisiveness of formal standards in decision-making.*

It is not advisable to apply for permits if the municipal land use plan (MLUP) does not indicate areas for wind turbines: the permits will be denied because the MLUP is not providing for wind power. If local authorities are not intended to cooperate in adjusting the MLUP, a wind power entrepreneur is empty handed. There are no legal instruments to force municipal authorities to cooperate and they consequently have a veto position in planning. The influence of local politics is large. This institutional embedded power position of local authorities is reflected in the experience of wind power entrepreneurs. They conceive it to be the most critical condition for project realisation: a positive attitude and an ambitious attitude of the city council and the municipal executive towards wind energy are necessities for implementation. However, the local political attitude with regard to wind power is perceived to be sensitive for the local popular opinion and not formally recognised arguments in the local political debate are said to be critical for the local political attitude. Entrepreneurial groups conceive these social conditions as critical

for the possibility to implement turbines and indicate that these conditions play an important role in almost every project.

Simultaneously, national and provincial governmental communication on the necessity of wind power is perceived to be limited. Too little attention has been paid at improving the local popular opinion. In addition, news coverage on wind power is perceived to be poor: one-sided negative reporting by the press is another critical social bottleneck for wind power implementation. '*News on wind power by the national and local press is often negative. Local civil servants and politicians use this information to make up their mind on wind power issues, without bothering to gain more in-depth knowledge*'.

2. *The quality of permitting is under pressure, due to the complex legal framework and limited administrative capacity. Implementation requires an ambitious local administrative attitude towards wind power.*

The fragmented character of policies and instruments from different policy fields such as environmental policy, nature conservation policy and the planning system is viewed to be an important cause of delay. Though improved national level conditions in the electricity policy field, i.e. favourable economic conditions since the end of the 1990s, a better bargaining position on the electricity market for private wind power entrepreneurs and a large consumer demand for green electricity, combined with willingness at the side of municipal authorities to cooperate in planning are necessities to start the permitting process, they are, in themselves insufficient for rapid implementation. Before installing a wind power project, permits and exemptions from several authorities on different levels of government must be secured (see appendix 3.4). This requires a sufficient knowledge base at the side of competent authorities to manage the different permitting processes in a consistent way and to assess wind power projects on legally fixed norms on complex matters, such as noise hindrance. Entrepreneurial groups often encounter shortcomings in administrative capacity (a lack of human resources and of knowledge on wind power procedures). The fragmented and complex character of the authorisation trajectory in combination with this lack of (local) administrative capacity is conceived to be an important bottleneck for market development.

Also the low threshold for appeal ended up high in the order of ranking in institutional bottlenecks. The authorisation trajectory offers the opportunity to make protest for everyone who feels affected with the project against limited costs (EURO 68.07 for appeal against revision or exemption of the municipal land use plan in 2002). Most of the appellants use a wide array of arguments to oppose to wind power projects, such as inefficiency and unreliability of wind turbines, landscape pollution, noise and shadow hindrance, bird collision, safety risks and the negative effect on neighbouring property values. However, the most cited argument that is perceived to be lying at the bottom of opposition is the negative effect on the landscape. Besides these arguments with respect to wind energy or a wind power project, appellants use arguments with respect to the followed procedures to make a stand for their interests: arguments concerning inconsistency in policy or incorrect implementation of legal norms. Projects can be highly delayed by these arguments; especially appeal at the litigation section of the Council of State prolongs the authorisation trajectory considerably, with at least a year[6] (Buuren, Backes, & Gier de, 2002). Consequently, the authorisation trajectory needs to be executed highly conscientiously, which is in view of its complex character and the limited local scope and structure of knowledge

not an easy job to perform. Though, all entrepreneurs indicate that social resistance is not a broadly supported local phenomenon, but a phenomenon that has its origin in a limited number of active opponents, they also stress that these appellants are an important source of delay. Simultaneously, entrepreneurs confirmed that 'projects don't fail on formal grounds in the procedures'. So, appellants don't stop wind power projects to be implemented, once the formal planning and permitting procedures have started.

All entrepreneurial groups -except energy distributors- assign importance to delays in permitting procedures. The burden of proof with regard to arguments raised by opponents rests on the competent authority or the wind power entrepreneur, which increases pre-investment costs. A potential explanation for the deviating opinion of energy distributors is that these companies are relatively wealthy, able to bear high-pre investment costs and to hold out long lead times.

3. *Insecurity of the financial support system leads to insecurity with regard to the financial viability of projects, but has not been a bottleneck for market development since the end of the 1990s.*

Frequent adaptations of the financial support system lead to uncertainty with regard to the financial viability of projects, which make entrepreneurs reluctant to invest. The Dutch financial support system is notorious for its complex and unstable character. Insecure economic financial support ended up third in order of ranking in institutional bottlenecks. At the same time, however, entrepreneurial groups made clear that economic profitability has not been a bottleneck for market development since 1997/1998. Changes in fiscal arrangements and subsidy regimes led to disturbance and delay in project realisation, but did not stop the market to evolve.

To adapt to changes in financial regulations and to make full use of financial possibilities, entrepreneurs need a sufficient knowledge base. Changing financial support systems in a liberalising market, which is characterised by increased competition, ask for professional types of entrepreneurs. If we compare the four entrepreneurial groups on their opinion on this theme, than we notice that small private investors and new independent wind power entrepreneurs assign less importance to insecurity of the financial support system, compared to wind cooperatives and energy distributors. Wind cooperatives are due to their voluntary character less well equipped to deal with changing financial circumstances in a liberalised market. The position of energy distributors is more surprising. Wind power exploitation is a small business component in these companies. Their core business is producing and selling a portfolio of electricity sources and wind power generation needs to compete with profit margins on these other sources. This might explain their deviating position. Whereas, wind power generation is core business for new wind power producers and an additional income for small private investors, energy distributors seem to switch to other more profitable options or import when profits threaten to fall.

4. *Some institutional conditions are experienced to be discriminating conditions in the market. Simultaneously, all entrepreneurs indicate that these conditions are relatively unimportant for market development.*

We provided three statements that consider potential discriminating effects of institutional conditions. These statements relate to, first discriminating effects of demands in provincial spatial policy, such as the requirement to install wind turbines in large clusters in a restricted number of industrial areas. This spatial requirement leads to a limited number of large-scale wind projects with high (pre)-investment costs, favouring large wealthy investors. The second statement

relates to the dominance of fiscal arrangements in the financial incentive system, which favours entrepreneurs with high profit margins above entrepreneurs with lower profit margins. And the third statements relates to the limited possibilities for decentralised producers in an oligopolistic market with a limited number of electricity suppliers. If we compare the entrepreneurial groups on their perceptions with regard to these conditions than we notice that experiences strongly diverge. The number of participants that strongly confirmed these statements equalled the number of participants that strongly refuted these statements. Two frames can be distinguished from the practical examples provided by the participants:

1. Liberalisation of the market, scale enlargement and increased competition requires a professional and market driven approach. These developments lead to increased technical and financial risks. Controlling those risks is hardly possible for small-scale private investors. Moreover, the fiscal incentive system additionally strengthens the tendency to wealthy professional types of entrepreneurs. They profit more from these schemes. Consequently, commercial new independent wind power producers and energy distributors will dominate the Dutch market.
2. Small private investors increasingly manage to strengthen their position on the liberalising market. Liberalisation for instance enabled them to establish Windunie. Windunie is a co-operative that represents the owners of approximately 300 MW of wind power, including some small-scale community and small private investors, as well as some new independent wind power producers (the biggest company owner has 45 MW of wind generation). Windunie aims to jointly sell their green electricity on the market, and negotiates prices for the basic buyback rates with three dominant energy companies in the Netherlands. Though small private investors are put at a disadvantage by spatial requirements in some provinces and by the fiscal incentive system, they are able to seize the opportunities provided by the liberalised market and they adapt to requirements set by increased competition. Moreover, most small private investors have a land location, something that energy distributors lack.

We notice that all entrepreneurs experience these conditions as relatively unimportant for market development. Energy distributors and new independent wind power producers assign no importance at all to these discriminating conditions. Small private producers and wind cooperatives assign some importance to discriminating effects of fiscal arrangements and demands in provincial spatial policy.

Solutions for critical social and institutional conditions

The various solutions for critical social and institutional conditions as proposed by entrepreneurs are not mutually exclusive. We clustered the solutions with respect to the content and kept the order of ranking of the entrepreneurs:

1. Creating a municipal interest in wind power by financially compensating municipalities;
2. Limitation of possibilities of appeal and reducing the complexity of the formal authorisation trajectory;
3. Abolishing investment and production subsidies; replacing these subsidies with a obligation for suppliers to buy renewable electricity against a sufficient price per kWh (feed-inn tariff);

4. Improvement of cooperation within the wind sector to better refute the arguments of opponents; and to increase positive PR;
5. Implementation of sanctions for administrative authorities for failing to realise wind power targets;
6. More information for (local) governments and politicians;
7. Community involvement in planning processes.

Entrepreneurs see the necessity of creating a municipal interest in wind power. By creating such an interest, they hope to secure the required local political support. The entrepreneurs propose to financially compensate municipalities for each kWh produced by wind energy. Who should pay for this compensation is a question that has been left aside.

Entrepreneurs stress the importance of limiting the possibilities of appeal and reducing the complexity of the formal authorisation trajectory. Both are procedural solutions, which aim at formal procedural bottlenecks in project realisation. In Dutch planning processes and environmental permitting procedures, access to official procedural stages is open for all. Entrepreneurs propose to end this 'actio popularis' in Dutch law. To be granted access in the procedures one should show a direct interest. In addition, they propose to integrate permits and moments for appeal in one single procedure and to transfer the burden of proof to the appellant. These procedural solutions get a high ranking. They reach a higher score than more strategic solutions, such as increased information for local governments and politicians and community involvement in planning processes. These latter solutions focus on creating social and political support by improved communication.

Remarkably, all entrepreneurs plea for abolishment of investment and production subsidies, and replacement of these subsidies by an obligation for suppliers to buy wind power against guaranteed price levels. In this manner entrepreneurs are no longer dependent on the changing governmental financial incentive schemes.

8.5 Local government authorities framing social and institutional conditions

The perceptions of local civil servants about the influence of social and institutional conditions in the operational process of realising wind power projects, can be divided in four coherent clusters regarding different aspects of the process. These clusters are derived from qualitative data (practical examples provided by the participants) and quantitative data (voting procedures and ranking order: see appendixes 8.1 and 8.2).

1. *The quality of planning and permitting is under pressure, due to the complex legal framework and limited administrative capacity. Implementation requires an ambitious local administrative attitude towards wind power.*
2. *The local political attitude towards wind power is vulnerable to the local popular opinion. Consequently, the phase of informal pre-deliberation on the possibility of wind power, i.e. the local political decision making process, is critical for projects to succeed. Local entrepreneurs seem to have a somewhat better change to successfully pass this phase.*

3. *The administrative agreement BLOW, which was introduced by the national government in 2001, is a praiseworthy communicative instrument for attempting to eliminate political and administrative bottlenecks for wind power implementation; it however does not solve local planning problems and possibilities for wind power entrepreneurs.*
4. *Nationally induced spatial planning requirements add new problems to implementation and sometimes unnecessarily block market development. Height restrictions lead for instance to the inefficient use of a location.*

In the following subsections we will elaborate on these categories of social and institutional conditions. In the last subsection, we finish with a reflection on solutions proposed by the civil servants for the most critical social and institutional conditions.

1. *The quality of planning and permitting is under pressure, due to the complex legal framework and limited administrative capacity. Implementation requires an ambitious local administrative attitude towards wind power.*

The fragmented character of policies and instruments from different policy fields and the involvement in the permitting process of different authorities on different levels of government are conceived to be critical conditions for wind power market development. Changing legislation, lack in intergovernmental coordination and incorrect implementation of policies, cause social and administrative resistance and corresponding delays. Opponents (both civic and administrative) use arguments concerning inconsistencies in the authorisation trajectory, such as inconsistencies in spatial planning on provincial and municipal level or incorrect implementation of EU legislation. A local civil servant: '*It is not clear to us how far different policies, such as the EU Habitats Directive, influence the planning of wind turbines in our municipality',* and *'It is impossible to run faultless through the authorisation trajectory, especially because different authorities and sections are involved. Opponents seize every opportunity provided by the legal system to make a stand for their interest. The burden of proof rests with the competent authority or the entrepreneur. This is, in view of the limited scope and structure of knowledge, a difficult institutional construct.'* Though all civil servants stress that overlap in, and complexity of, procedures lead to delays in implementation and hamper market development; they did not recognize it for their own situation. This is remarkable: lack in (local) administrative capacity to manage the authorisation trajectory properly is acknowledged as problem in general, but not for the own municipality.

2. *The local political attitude towards wind power is vulnerable for the local popular opinion. Consequently, the phase of informal pre-deliberation on the possibility of wind power, i.e. the local political decision making process, is critical for projects to succeed. Local entrepreneurs seem to have a somewhat better change to successfully pass this phase.*

Local civil servants hold the view that the chance for project realisation increases considerably when the city council and the municipal executives are ambitious towards wind power implementation. In that case, projects may be delayed, but they don't reach a deadlock on formal grounds in the procedures. Simultaneously, civil servants stress that the required local political ambition depends on the local popular opinion and that not formally recognised arguments play an important role in the local political debate on wind power. '*Wind turbines always evoke strong emotions. These emotions set the tone in hearings on wind power'.* In view of the required local political support for spatial planning, the conclusion seems justified that the phase of informal

local political debate on the necessity and possibility of a wind power project is most critical for the project to succeed. *'Ambitions towards wind power implementation disappear quickly if the city council gets confronted with fierce social resistance. This holds especially when council elections are on the way'.*

According to the participating local civil servants, projects of local entrepreneurs may depend on more administrative and local political support than projects of 'foreign' entrepreneurs. Participants recognised this view both as being general applicable and for their own situation. If we consider this in coherence with the importance of the phase of informal pre deliberation in spatial planning, we can carefully conclude that projects in which local entrepreneurs are involved, have a better change to successfully pass the local political phase, than projects initiated by 'foreign' entrepreneurs. A local civil servant: *'Local entrepreneurs (farmers) initiate wind power projects in our municipality. Those entrepreneurs are the grassroots support of the main local political parties. These local political parties support the initiatives in the city council'.*

3. *The administrative agreement BLOW, which was introduced by the national government in 2001, is a praiseworthy communicative instrument for attempting to eliminate political and administrative bottlenecks for wind power implementation; it however does not improve local planning problems and possibilities for wind power entrepreneurs.*

In 2001, a wind power administrative agreement known as 'Governmental Agreement on the National Development of Wind Energy' or BLOW (Bestuursovereenkomst Landelijke Ontwikkeling Windenergie) was introduced. It incorporates six ministries of the national government, all of the twelve Dutch provinces and the association of Dutch local authorities. The aim of this covenant is 1500 MW of capacity onshore in 2010. Under this administrative agreement each province has a target to designate locations for wind turbines. Central to BLOW is that all government parties together should realise these provincial targets, taking the relative balance and powers into consideration. In the framework of BLOW, provinces developed steering strategies to guide municipalities in wind power implementation[7]. If by the year 2005 municipalities do not intend to cooperate, the provinces have the right to dictate areas for wind energy in any municipality (Duyn van, 2005).

The civil servants unanimously value the existence of BLOW: the statement regarding BLOW ended up third in order of ranking in institutional conditions. Simultaneously, they indicated that BLOW has not improved possibilities for wind power entrepreneurs. Though the instrument increases administrative élan, it does not solve local level planning problems. '*BLOW is a praiseworthy instrument, but reality is stubborn. Municipalities don't feel obliged to BLOW: they see the target as a central governmental and provincial problem. Moreover, BLOW doesn't solve local level problems such as social resistance'.* Most civil servants hold the view that national policies on wind energy, which often refer to global climate change to justify targets and instruments, pass over regional and local level planning praxis. Local level planning praxis is characterised by local resistance against wind power arising from local interests, such as the local landscape. BLOW is a nationally induced administrative agreement that stimulates communication between provincial and municipal authorities on wind power implementation. It aims for increased local administrative support, which however, seems to be determined more by the local popular opinion.

4. *Nationally induced spatial planning requirements add new problems to implementation and sometimes unnecessarily block market development. Height restrictions lead for instance to the inefficient use of a location.*

The Fifth National Policy Document on Spatial Planning (*Vijfde Nota Ruimtelijke Ordening*) (2001) gives instructions on wind energy sites. Wind turbines should be concentrated on lines and clusters, if possible they should be build in business parks or close to highways, railways and canals. Solitary installation and placement in open landscape is not allowed any longer, unless the turbines can blend well into the landscape. Most provinces have adopted the demand for clustering in their regional land use plans and also at the local level a continued effect can be seen[8]. This demand for clustering is perceived as a complicating factor in project development. Projects get more complex because more landowners and municipalities are involved. Also the demand to build turbines in business parks or close to highways adds new problems to implementation. On these locations, more functions and people are present near the turbines, which ask for new types of risks assessments and standards. Besides the nationally induced demand for clustering turbines at certain appropriate areas, height restrictions are inserted in almost every regional and municipal land use plan. According to local civil servants, these height restrictions lead to inefficient use of locations and they unnecessarily slow down market development. *'The difference between a turbine with a mast height of 70 meter or a mast height of 100 meter is hardly visible. Whenever the question about the appropriateness of wind power within a municipality is answered positively; no further height restrictions should be imposed'.*

Solutions for critical social and institutional conditions

The solutions as proposed by the participating civil servants are not mutually exclusive. We clustered the solutions with respect to the content and kept the order of ranking on feasibility and desirability of the civil servants:

1. More (public) information for citizens and governments
2. Measurable quality requirements in spatial planning; and a more explicit testing framework
3. A bottom-up approach in planning: community involvement in planning
4. Limitation of possibilities to appeal against a project and reducing the complexity of the formal authorisation trajectory
5. Top down planning by higher governments

The importance of providing more and better (public) information is emphasised. Providing information is considered to be highly feasible and desirable. In addition, participants mention the importance of using a bottom up approach in planning. Though they stress the importance of community involvement, it is not considered to be very practicable within the complex local political praxis. The aim of bottom up planning is increased social support. However, social resistance hampers the political support that is required to start such planning processes. In addition, these processes take time and entrepreneurs want to fasten planning.

Limitations of possibilities to appeal, reducing the complexity of the formal authorisation trajectory and a top down planning approach are also mentioned as solutions. However, the feasibility of these procedural solutions is considered to be limited: these solutions do not prevent social resistance.

Finally, all participating civil servants mentioned the option of switching to offshore wind energy to spare onshore locations. Though this option is considered to be highly desirable, they are very sceptical about the feasibility of offshore wind power in the short run.

8.6 Comparing wind power entrepreneurs and local civil servants

Though entrepreneurs and local civil servants stress different aspects of the operational process of realising wind power, their perceptions about social and institutional conditions are largely identical. However, with regard to the proposed solutions both groups differ in their approach.

Both groups stress the importance of the institutionally embedded power position of local politicians and the sensitiveness of the local political debate for the popular opinion and not formally recognised arguments. Social resistance is not a broadly supported local phenomenon, but has its origin in a limited number of active opponents, which are able to dominate the local political debate. The phase of informal deliberation, on the question whether or not the municipal land use plan should be adjusted for wind power, is the most critical phase in project development. Entrepreneurs cannot bank on the decisiveness of formal standards in this phase; the local popular opinion is decisive. Entrepreneurs furthermore hold the view that too little attention has been paid by the national government at improving this opinion. Local entrepreneurs seem to have a somewhat better chance to successfully pass this phase, at least according to the experiences of the local civil servants.

A second aspect is the complex legal framework and the shortcoming in administrative capacity to manage the authorisation trajectory properly. Appellants use a broad array of arguments, amongst them arguments concerning inconsistency in policy or incorrect implementation of legal norms. Judicial appeal based on these arguments strongly delays project realisation. Consequently, the authorisation trajectory needs to be executed highly conscientiously, which is a difficult job to perform in view of the limited administrative capacity. Implementation therefore requires an ambitious local administrative and political attitude, which is sensitive for the local popular opinion that in turn is dominated by a limited number of opponents. Both, entrepreneurs and civil servants stress that appeals in the permitting procedures strongly delay projects, but don't lead to deadlocks in implementation: the permitting phase is a less critical phase than the phase of informal deliberation on spatial planning.

Entrepreneurs stress conditions that relate to the financial feasibility of projects. They indicate that changes in fiscal arrangements and subsidy schemes lead to disturbance and delay in project realisation. These changes however did not stop market development. A side effect of changing financial conditions is increased professionalism in the market: entrepreneurs need a sufficient knowledge base to be able to adapt to changing conditions.

Conditions that relate to the financial feasibility of projects are outside the competences of local civil servants. Consequently, they focus on different conditions, such as national level governmental steering strategies that do affect their tasks and competences. The administrative agreement BLOW is a nationally induced instrument, which according to civil servants passes over a crucial aspect of the local planning problem. BLOW aims for local administrative and

political support by increased communication between provincial and municipal authorities. However, local political support is determined more by the local popular opinion. Civil servants also mentioned problems that result from new nationally induced spatial planning requirements, such as clustering the turbines on certain appropriate areas, which make the planning process (both procedural and socially) more complex.

With regard to the proposed solutions, both groups differ in their approach. In general terms, two types of solutions can be distinguished. The first types of solutions are procedural solutions, such as limiting the possibilities to appeal, reducing the complexity of the formal authorisation trajectory and using a top down planning approach. These solutions aim at formal procedural bottlenecks. The second types of solutions are strategic solutions, such as providing more information on the necessity of wind power for local governments, politicians and citizens, and community involvement in planning processes. Though both groups explicitly mention both types of solutions, entrepreneurs stress procedural solutions above strategic solutions and civil servants stress strategic solutions above procedural solutions.

Entrepreneurs hope to secure the required political support by creating a financial interest for municipalities. In addition, they propose to integrate permits and moments for appeal and to transfer the burden of proof to appellants. These procedural solutions are tangible. If these solutions become implemented, they become part of the formal institutional framework. This means that entrepreneurs can bank on them formally. Moreover, the primary aim of these solutions is fastening of planning and permitting procedures.

Civil servants consider the feasibility of procedural solutions to be limited because these solutions do not prevent social resistance. Social resistance is perceived to be lying at the bottom of procedural problems. They stress the necessity of providing more and better information and community involvement in planning processes for creating the required local social and political support. At the same time they acknowledge that strategic solutions take time and that results are insecure within the complex local political process.

8.7 Reflection on the main findings

The subsequent steps that need to be taken to bring a wind power project on line are not only determined by national level electricity policies, but also by policies and instruments in other fields, such as land use policy, environmental policy and nature conservation policy. Electricity policies, developed to stimulate wind power mainly focus at reducing the differences between generation costs for wind power and fossil fuel based electricity, thus stimulating wind power investments. Actual implementation however takes place within the whole of restrictions set by other policy fields. These policy fields aim at securing qualities that are not secured by the free market, such as scenic qualities, wild life values and noise levels. These policies converge on the operational level of implementation and constitute the institutional framework in which wind power entrepreneurs and other stakeholders involved operate. Procedural and societal problems exist at this operational level of wind power implementation.

Reducing procedural and administrative bottlenecks in the operational process of implementation has been mentioned as an important aspect of wind power policy support in various national memorials and letters to Dutch Parliament. The first Energy Report (Ministry

of Economic Affairs, 1999) explicitly mentioned that preference should be given to streamlining planning and permitting procedures. The second Energy Report (Ministry of Economic Affairs, 2002) concluded that the development of wind power was lagging behind the governmental target. Main problems identified were problems with spatial planning and an insecure investment climate. However, following the results of the workshops, the absence of a stable investment climate has led to disturbance and delay in project realisation, but economic profitability has not been a problem for market development since 1998. In other words, financial schemes that were available to make onshore wind power projects attractive to market parties have not blocked market development. Problems with spatial planning, on the contrary, have. Some steering strategies have been developed at the national level to solve these planning problems. However, on the basis of our research findings one might doubt if these incentives are strong enough and address the right problems.

First of all, the national government has introduced the administrative agreement BLOW in 2001, with the aim to ensure the installation of 1500 MW of wind power capacity in 2010. This nationally induced instrument stimulates communication between provincial and municipal authorities on wind power. Aiming at improved communication between provincial and municipal authorities, BLOW does not address social resistance, which seems to underlie the required local administrative or political support.

Second, in 2002, the state secretary of Economic Affairs set up an interdepartmental taskforce 'Bottlenecks for gas extraction and wind energy'[9]. This taskforce was charged to draw up an inventory of the formal rules and procedures applicable to wind power projects. The aim of the inventory was to offer proposals to lessen the authorisation trajectory by half. Most of the recommendations of the taskforce were in line with the solutions proposed by wind power entrepreneurs; they aim at reducing procedural bottlenecks related to the formal institutional framework. Though addressing institutional bottlenecks is important, procedural solutions pass over more fundamental problems situated in the setting of social conditions. In a certain sense, the formal institutional framework (formal rules, procedures and instruments) is neutral. Social conditions put meaning into this institutional framework. Exactly these social conditions, such as social resistance or a negative popular opinion on wind power are experienced to be highly problematic. Most national policies on wind energy refer to global climate change to justify targets and instruments. Many opposition groups question this contribution of wind power to the reduction of climate change[10]. Public communication on this point has been limited. Consequently, the necessity and importance of wind power in relation to costs on the local level are insufficient clear[11]. Too little attention has been paid at clarifying the cost-benefit discussions on the local level and at improving the local popular and administrative opinion, which are, paradoxically, the main solutions for reducing procedural bottlenecks. Local civil servants seem to acknowledge this paradox. They consider the feasibility of procedural solutions to be limited and stress the necessity of strategic solutions, such as providing more public information on the necessity of wind power and community involvement in planning. However, these strategic solutions take time and they are perceived to give less security for investors since they're no part of the formal institutional framework. Unfortunately, time is limited resource in a liberalised setting and investors prefer institutionalised securities.

Use of the Electronic Board Room

A Group Support System (GSS) in an Electronic Board Room (EBR) can be used in two different ways in policy analysis. It can be used to explore complex problems to identify those aspects that require attention in further research. It can also be used for testing and evaluating results. The advantage of bringing a group of stakeholders together in an EBR is that they together possess practical knowledge and insights from different angles. Interaction between those stakeholders, the sharing of knowledge and points of views, gives a good base for testing results on the sense of reality. In an EBR it is the researcher who creates the framework for reflection (statements), thus steering the results. Consequently, the framework must be carefully constructed, based on insights into the policy field under scrutiny. Moreover, the framework must be flexible: participants should be given the opportunity to add statements of their own. Use of the EBR proved to be fruitful in our study of the operational process of realising wind power implementation. It enabled us to test insights derived from earlier studies (literature study, stakeholders' analyses and surveys), thus increasing the robustness of the results of those studies. The workshops delivered a large amount of data, giving a good base for analytical generalisation.

Notes

1 4 representatives of energy distributors, 11 representatives of new independent wind power developers, 9 representatives of small private investors and 3 wind cooperatives)

2 12 provincial wind coordinators and 45 municipal civil servant in the fields of spatial planning, environment and/or energy

3 Results of the following two cases were used: 'solitary installations by small private investors in the municipality Zeewolde' (see chapter 5) and 'large-scale implementation by the energy distributor in the municipality Zeewolde' (see chapter 4).

4 We conducted a survey amongst energy distributors and new independent wind power entrepreneurs, amongst members of the 'Association of Wind Turbine Owners in North Holland' (*Vereniging van Wind turbine eigenaren in Noord Holland*), and amongst Dutch wind cooperatives.

5 We invited each participant to put the institutional and social conditions in order of importance with regard to project realisation and market development. Each participant was asked to allocate a total of 100 points, to be divided over the various conditions.

6 The formal trajectory for a large-scale wind power project of more than 15 MW in the neighbourhood of a Nature Reserve consists of at least 6 different procedures, and provides for formal deliberation at 8 different moments. In addition, judicial appeal at the Litigation Section is possible at another 7 moments.

7 Provinces use different steering strategies to guide municipalities: top down, interactive and bottom up strategies (Duyn van, 2005).

8 The MLUP is the only legally binding plan in the whole Dutch planning system. Although, the Spatial Planning Act contains consistency requirements for local and regional land use plans (planning hierarchy), the Dutch land use planning system is characterized by 'the absence of the obligation to bring spatial plans in line with the strategic plans (or key decisions) of a 'higher' government' (Hajer & Zonneveld, 2000: 337-355).

9 This taskforce was set up within the framework of the national B-4 project: Beter Bestuur voor Burger en Bedrijf 'Better Government for Citizens and Companies'. The aim of this project is to reduce the burden of rules and procedures for the corporate sector and to increase the quality of government performance for citizens and companies.

10 One of the most important opposition groups at the national level is the National Critical Platform of Wind energy (NCPF). More than 50 local opposition groups are represented in this organisation. It effectively feeds local social resistance and provides procedural and judicial information on how to delay or block wind power projects. This ever-better organised social opposition makes wind energy a sensitive local political dossier.

11 Currently, the Netherlands Bureau for Economic Policy Analysis (CPB) and the Energy Research Centre of the Netherlands (ECN) carry out a societal costs and benefits analysis for different renewable electricity options by order of the Ministry of Economic Affairs.

9 Discussion, conclusions and lessons learned

9.1 Introduction

This dissertation focuses on wind energy for electricity generation, analysing the evolution of the wind power supply market in the Netherlands. We analysed different kind of wind power entrepreneurs, their capacity to implement wind energy and the social and institutional conditions that affected their investments over the period 1989-2004. Central in the analyses are the institutional regulatory dimension and the social context as explanatory variables for the emergence and performance of these wind power entrepreneurs. Special attention is given to the liberalisation of the electricity market. The following core research question has been addressed in this study:

How and to what extent have social and institutional conditions affected the emergence and performance of wind power entrepreneurs in the wind power supply market in the Netherlands, and what lessons can be learned for future wind power policy?

In this final chapter we will reflect on the main findings with regard to the development of the wind power market, and the effects of social and institutional conditions and their interdependencies over the years. We discuss the role of governance in these developments and provide several recommendations for future wind power policy. Finally, we will reflect on our analytical perspective and the use of the implementation capacity concept.

9.2 The wind power supply market

As a first characteristic we have seen that the emergence of a wind power supply market in the Netherlands has been the work of four different types of wind power entrepreneurs: energy distributors, small private investors, wind cooperatives and new independent wind power producers. Each of these types of entrepreneurs has been active since the end of the 1980s, but they followed very different development paths and performed differently throughout the years. Energy distributors represent the former monopolistic electricity sector, and have been the original market players on the (renewable) electricity market. The other three types of investors are newcomers.

A second characteristic of the wind power supply market is the shift in the relative importance of these four entrepreneurial groups. Energy distributors dominated the market at the beginning of the 1990s, but their role has declined in importance in the course of the years. Since the end of the 1990s, small private investors have caught up with – and in 2002 even surpassed – energy distributors in terms of capacity installed over the last 15 years. Also new independent wind power producers have become more important over the last four years (2001-

2004) and surpassed energy distributors in the amount of wind energy produced. Only wind cooperatives were and remained less important.

Third, entrepreneurial groups, that restricted their activities to a certain region, have dominated the market until the end of the 1990s. In fact, new independent wind power producers were the first entrepreneurs who competed for locations in the entire country. While energy distributors stuck to their original monopoly of supply areas for long, small private investors only established wind turbines on their own land, and wind cooperatives mutually agreed on the selected working areas of each cooperative, new independent wind power entrepreneurs were footloose with regard to this aspect.

A final characteristic is the fragmented character of the wind power supply branch representation. Three different branch organisations were created in the 1980s: a branch organisation for wind turbines manufacturers, a wind energy association for energy distributors and a wind union for private wind power producers. These associations had different types of members and served different and competing interests. This fragmented and antagonistic character of the market prevented a homogeneous protection of their common interests. The wind sector never developed a strong countervailing power towards national policies. It would be 2002 before this fragmentation in the protection of the interests started to decrease.

The development of the wind power supply market was a wavering and hesitating process towards a liberalised market. The start of this process was dominated by the lengthy tradition of interrelatedness between the Ministry of Economic Affairs and the state-owned electricity sector (energy distributors), which set the tone in electricity policy developments in the first half of the 1990s. There was not a freely accessible wind power market and energy distributors dominated in terms of total capacity installed annually. This monopolistic situation changed with the liberalisation process that started in 1998 and that led to a better bargaining position of private wind power producers.

At the end of the 1990s, the wind power supply market started to show a relatively large number of new entrants and increased competition. The liberalisation of the market and a substantial improvement in the profitability of projects, due to changes in financial incentive schemes, has been crucial for this growing entrance and competition. The increasing number of market players (especially new independent wind power producers) led to stronger competition at the operational level of implementation. Simultaneously, competition on kWh prices hardly occurred. Governmental financial incentive schemes determined kWh prices.

While strategic energy policies stimulated new market players to emerge, problems at the operational level of implementation and the resulting long-lead times hampered new market players in implementing projects. It normally takes 4 to 6 years to implement a project and the risk of failure is considerable. This makes the onshore wind power market a difficult market for new investors. The absolute number of new market players remained very limited for that reason. Especially new market players without roots in the (renewable) energy sector are still rare.

Our study illustrates that the wind power supply market is a government made market, in which social and institutional conditions facilitate different types of entrepreneurs to a more or lesser degree. The case studies on the entrepreneurial groups show that the shifts in importance between entrepreneurial groups, the differences in development paths and performances, have

to do with differences in entrepreneurial characteristics and with changes in national and local social and institutional conditions.

9.3 Analysing the wind power supply market: analytical perspective

To realise a shift towards renewable electricity in an electricity market dominated by fossil fuel electricity generation, it is vital to understand the conditions that prompt entrepreneurs to invest in wind power projects and the conditions that determine the chance of success if these entrepreneurs do implement and exploit their projects. Our analytical perspective to study investment behaviour of wind power entrepreneurs and their capacity to implement wind energy can be referred to as the 'new institutional perspective'. This analytical perspective focuses on the interaction between the behaviour and preferences of the individual actors on the one hand and the opportunities and constraints embedded in the institutional context in which they operate on the other hand. Precisely this interplay is at the heart of our analysis. We used this new institutional perspective to develop an operational research design that enabled us to analyse the dynamics of the wind power supply market, the role of wind power entrepreneurs, their characteristics and performance and the role of governmental steering.

The actual results of investment behaviour, in terms of the amount of wind power capacity actually implemented, has been analysed using the concept of *implementation capacity* (IC). The concept of IC is used as a qualitative variable, which enabled us to describe and explain differences over time in the performances of different types of entrepreneurs. We assumed that the IC is determined by the sum of the relevant economic, technical, institutional and social conditions and mutual interdependencies. These conditions affect the decisions made by entrepreneurs on investments in wind power and determine the opportunities for entrepreneurs to actually implement wind power projects.

To analyse (changes in) implementation capacity, our research specifically focused on two groups of conditions and their interdependencies (shaded in grey in figure 2.1).

The first group of conditions is the group of social conditions: the interactive nature of the preferences and behaviour of wind power entrepreneurs and other stakeholders involved in wind power implementation.

The second group of conditions is the group of institutional conditions: the constellation of rules that structure the interactive behaviour of actors and determine the opportunities and constraints for wind power entrepreneurs.

Third, our research focuses on the interdependencies between these institutional and social conditions. We focused on changes in institutional conditions and on the consequences of these changes for investment behaviour and the possibility to implement wind turbines.

Technical and economic conditions seem to be particularly important with respect to the creation of a market. They are threshold conditions: a technology needs to be viable and commercially attractive exploitation must be possible in order for investors to appear and for a market to emerge. However, being preconditions, technical and economic conditions are not the end of the story. How the market develops proofs to be especially dictated by developments in social

and institutional conditions. Looking at regional and local level developments, we found that implementation rates and the entrepreneurial groups involved differ significantly between the 12 Dutch provinces. These differences cannot be explained by differences in wind regime or other technical and economic conditions.

In our perspective we assume that the effects of the wider societal context and the economic and technical context become visible in the social and institutional conditions. The wider societal context and the economic and technical conditions are reflected in the knowledge base and perceptions of the investors in the market and in this way indirectly influence their behaviour. Moreover, improvements in technical and economic conditions do not necessarily add to the implementation capacity of entrepreneurs, because these improvements might have institutional and/or social repercussions. A simplified example concerns technological developments. Twenty years ago, turbines had a capacity of just 25 kW. Today, large multi-megawatt turbines placed on 100 metre high towers are commercially available. One of the consequences of this change in technical conditions is that provincial and local authorities increasingly demand that turbines are clustered. Installation of solitary turbines is no longer allowed. This change in institutional conditions implies a change in social conditions: the demand for clustering almost automatically signifies the involvement of more than one landowner in wind power projects. Cooperation between landowners becomes a prerequisite.

The dimension of time as a theoretical concept is also important in our analysis of the market and implementation processes. Ex ante potential studies or market analyses often take a snapshot. They miss the continuous dynamics in social and institutional conditions affecting the implementation capacity for entrepreneurs. The evolution of the market can be understood only by analysing these dynamics in social and institutional conditions over the long-term.

9.4 Institutional conditions over the years

With regard to institutional conditions, we analysed the constellation of rules structuring the interactive behaviour of actors and determining the opportunities and constraints for wind power. The formal institutional framework (formal rules, procedures and instruments) comprises (1) the rules that determine positions of actors on the electricity market or the market structure, (2) financial preconditions and (3) preconditions for implementation or planning and permitting procedures. We will elaborate on each of these clusters of institutional conditions.

The first cluster consists of rules structuring the market. The wind power supply market in the first half of the 1990s was a monopolistic market. Private wind power producers were obliged (1989 Electricity Act) to sell their electricity output to the regional energy distributor. Energy distributors were in turn obliged to purchase all the electricity generated by private wind power producers located in the area in which they had a monopoly on supply.

In this context the central government addressed the public companies with a collaborative approach applying voluntary agreements. These voluntary agreements, such as the Environmental Action Plan covenant and the Governmental Agreement on Planning Problems Wind Energy,

contained renewable electricity targets. In line with the monopolistic market structure, energy distributors were regarded as the actors that should meet those targets.

The institutional structure of the electricity market started to change away from being monopolistic with the publication of the third White Paper on Energy in 1996, which prepared the Netherlands for the liberalisation of the electricity market at the European level with EU Directive 96/92/EC. It outlined the essentials of Dutch future electricity policy: liberalisation of the sector and the promotion of a sustainable electricity supply. The 1998 Electricity Act created the institutional framework for the broader process of liberalisation, which disintegrated the monopoly powers of energy distributors. Private wind power producers were no longer obliged to sell their electricity to the regional energy distributors which implicated that their bargaining power increased. Moreover, the 1998 Electricity Act regulated the guaranteed and immediate access to the grid for private producers. Although it took some years to repair the shortcoming in these rules for grid connection and the implementation of these rules, these institutional changes contributed to the implementation capacity for private investors.

In July 2001 the green electricity market was the first segment of the market to be fully opened up to competition. Since then, all consumers have been free to choose their green electricity company. The emergence of a large consumer demand in following years positively affected the implementation capacity of all entrepreneurial groups.

The second cluster of institutional conditions deals with the creation of prices. The wind power supply market is an artificial market; the creation of prices fully depends on the availability of financial incentive schemes. Consequently, the market is very sensitive for changes in these schemes.

The 1989 Electricity Act contained a method (Standard Arrangement for Redeliveries (SAR)) for calculating the tariffs for wind power. This Standard Arrangement for Redeliveries and the MAP levy were important institutional conditions for the financial feasibility of wind power exploitation. Both were conditions with a strong element of self regulation, giving energy distributors a special power position in financial support: energy distributors decided on the distribution of the MAP subsidies, and the actual conditions for the payback tariffs had to be agreed on a case by case basis by a regional energy distributor and a potential wind power generator. These two institutional conditions gave energy distributors a special power position in financial support for wind power. Besides these two institutional conditions, the Dutch financial incentive system consisted of various forms of direct financial support designed to stimulate the market.

The start of 1996 (after the publication of the third White Paper on Energy) saw an important turning point: the emphasis on subsidies shifted with the greening of the fiscal system. Investment subsidies were considered to be unfeasible under free market conditions. They were abandoned at once and fiscal instruments were gradually introduced. These fiscal instruments created a favourable investments climate for wind power producers in general, and were crucial for the emergence of new independent wind power producers.

A green certificate system managed by the government came into effect simultaneous to the liberalisation of the green electricity consumer market. It replaced the informal and voluntary Green Label system that was implemented by energy distributors in 1998. The replacement of the Green Label system, combined with the termination of the voluntary MAP agreement in 2000 implicated that energy distributors lost their central position in financial support for wind power.

The result was a decrease in implementation capacity for energy distributors in comparison to the implementation capacity for private power producers.

A relatively large number of new market players emerged at the end of the 1990s (they all hoped to profit from the favourable fiscal incentive system). They emerged in a turbulent period characterised by a very profitable but insecure investment climate. Many sudden changes in incentive schemes caused insecurity in the market.

The third cluster of institutional conditions contains planning and permitting procedures. The successive steps to be taken to bring a wind power project on line (such as acquiring land ownership, spatial planning, and securing permits) are not only determined by strategic energy policies and financial instruments developed to stimulate wind power production, but also by policies and instruments in other fields such as land use, the environment and nature conservation. These policies aim at securing qualities that are not secured by the free market, such as scenic qualities, wild life values and noise levels. Various competent authorities at different levels of government are involved in the authorisation trajectory for wind power projects, which is rather complex and fragmented of character. The trajectory consists of between three and seven different procedures (dependent on the size and location of a project) and provides for formal deliberation and participation by administrative authorities, organised social interests, market agencies and individuals.

Comparing changes in planning and permitting procedures with changes in strategic energy policies and financial instruments, we notice that planning and permitting procedures have been relatively stable over the years. A few procedures have been relaxed somewhat, such as the abolishment of the environmental permit for projects below 15 MW in 2001[1], and some new procedures have been implemented, such as the Dispensation under the Law on the protection of Wild Fauna (2002). The impact of these changes has been limited however. The most important institutional condition in this cluster, the municipal land use plan, remained unchanged. This institutional condition is a very important deviance of the concept of the free market. If the municipal land use plan does not stipulate areas for turbines it is inadvisable to apply for permits: they will be denied because the land use plan does not provide for wind power. Consequently, an exemption or revision of the plan is required first. If local authorities do not intend to cooperate by revising the municipal land use plan a wind power entrepreneur will be left empty-handed. There are no legal instruments entrepreneurs can use to force municipal authorities to cooperate, which means they have a veto: the influence of local politics is large.

The only important institutional change in planning and permitting procedures over the last 15 years arose from national land use policy: the demand for clustering turbines in 2001. As solitary installations were no longer allowed, different entrepreneurs were more frequently competing for the same location. Projects became more complex because more landowners were involved, and increased competition caused increasing prices for land. Moreover, the demand for clustering led to increasing scales of wind power projects with corresponding higher (pre) investment costs. Typically, the demand for clustering worked out differently for the four entrepreneurial groups. This new requirement was diametrically opposed to the fact that the far majority of turbines that were installed by small private investors were solitary installations. Although, small private investors at least had a land location, they were compared to the other three types of entrepreneurs less flexible with regard to the exact location of the site. Moreover, large investors, such as energy distributors were more flexible with regard to the

required capital needed. Comparatively speaking, clustering was more of a disadvantage for small private investors and wind cooperatives than for energy distributors and new independent wind power producers. New independent wind power producers were professional entrepreneurs who strategically sought for opportunities. They initiated a portfolio of projects, acquiring a variety of locations in order to spread the risks.

In short, the major institutional changes in each of the three clusters have been:

1. A transition from a monopolistic market structure, in which strategic energy policies facilitated energy distributors, to a liberalised market structure, in which the bargaining powers of private producers increased.
2. A transition from a subsidy incentive system with a central role for energy distributors in financial support, to a fiscal incentive system, characterised by a very profitable investment climate just as accessible for private power producers as for energy distributors.
3. Though the authorisation trajectory is fragmented and complex of character, the planning and permitting procedures remained relatively stable throughout the years. The only important institutional change was the demand for clustering, which was comparatively speaking more of a disadvantage for small private investors and wind cooperatives than for energy distributors and new independent wind power producers.

9.5 Social conditions over the years

With regard to social conditions, we analysed the interactive nature of the preferences and behaviour of wind power entrepreneurs and other stakeholders involved in wind power implementation. The constellation of social conditions comprises (1) characteristics of the entrepreneurial groups, (2) the social constellation of stakeholders and their perceptions and (3) the interaction between wind power entrepreneurs and other stakeholders involved. We discuss the main findings on these clusters of social conditions.

The first cluster consists of the characteristics of the four entrepreneurial groups. Specific entrepreneurial characteristics have proven to be part of the explanation for the differences in paths and performances. The most important distinctive characteristics are the motivation to invest in wind energy, the degree of professionalism and the position of wind energy as investment option.

The limited intrinsic motivation of energy distributors to invest in wind energy at the beginning of the 1990s is illustrative. Energy distributors have their roots in the electricity sector, which never was in favour of decentralised generation and where concerns about diversification and reducing environmental degradation traditionally were of minor significance. This limited priority of wind power weakened the implementation capacity for energy distributors.

New independent wind power producers are the only market players for whom wind power exploitation is a core-business. These professional wind power entrepreneurs emerged rather late onto the market. They needed a more commercially attractive market in order to invest in comparison to the other entrepreneurial groups. Wind cooperatives, on the contrary, were idealistic organisations with a voluntary and amateurish character. Ideological arguments have been decisive in their behaviour. For small private investors wind power exploitation it is an

additional income, and for energy distributors wind power exploitation is just a small component of their business. Their core business is producing and selling a portfolio of electricity sources and wind power generation needs to compete with profit margins on these other sources.

The second cluster of social conditions has to do with the social constellation of stakeholders and their perceptions. Policy making processes and the authorisation trajectory for wind power projects bring numerous players into the equation, such as government authorities at different levels, land owners, environmental organisations and local residents. Who exactly will be involved depends on the precise location and the technical characteristics of a project and the local social constellation. The institutionally embedded power position of local politicians and the sensitiveness of the local political debate for the popular opinion and not formally recognised arguments are important social conditions at the operational level of implementation. The phase of informal deliberation, on the question whether or not the municipal land use plan should be adjusted for wind power, is the most critical phase in project development (due to the veto position of municipal authorities). In this phase, we see a confrontation of ideas about wind energy. The local political debate is dominated by a questioning of the contribution of wind power to the reduction of climate change, and by diverging ideas about necessity and importance of wind power in relation to costs on the local level. Entrepreneurs cannot bank on the decisiveness of formal standards in this phase; the local popular opinion is decisive. This opinion, in turn, can be dominated by a limited number of active opponents.

The third cluster of social conditions concerns the interactions between wind power entrepreneurs and other relevant stakeholders. An example of interaction at national level is the collaborative policymaking with voluntary agreements of the Ministry of Economic Affairs and energy distributors at the beginning of the 1990s. It created strategic energy policies that improved the implementation capacity of this entrepreneurial group and it stimulated large-scale initiatives by the energy distributors, but it ignored the other types of entrepreneurs.

An example of interaction at the local level relates to the performance of small private investors in the municipality Zeewolde, as has been analysed in chapter 5. These small private investors focused on solitary installation and were able to implement projects with relatively short lead times. These short lead times can be explained by a self-strengthening process of local capacity building, in which the importance of social conditions prevailed and in which the shared economic interest was a main driver. Local interactions, such as authority relations and relations of trust, facilitated coordinated actions and improved the bargaining position of these small private investors on the liberalising market. Social coherence at the local level contributed to their implementation capacity. This process of local capacity building for small private investors is not representative for all Dutch provinces over the last 15 years.

Another but opposite example of interaction at the local level is provided by the inside look into a typical project for energy distributors in chapter 4. The strategy of frequent and informal contact between the energy distributor and the competent authorities with the aim to increase administrative commitment and to reduce the insecurity on the course of procedures turned out to be counter-productive. Although this strategy of informal and closed top-down decision making was important for solving problems with procedures, it simultaneously brought about a loss of support from other (local) interests. Residents were not actively involved in planning and licensing, which strengthened their opinion that the authorities passed over the interests of the

local community. The mismatch between the local common interests and the external private or global environmental interests caused local social resistance, and hampered the implementation capacity for energy distributors.

In short, three clusters of social conditions proof to be relevant:

1. Entrepreneurial characteristics partly explain the differences in performance. The most important distinctive characteristics are the motivation to invest, the degree of professionalism and the position of wind energy as investment option.
2. The social constellation of stakeholders with free access to the local decision making process brings about barriers in the local political process. A confrontation of ideas about the necessity and (local) costs of wind power dominates the local political debate. There is no unity in the conceptualisation of wind energy and this confrontation of ideas is slippery for entrepreneurs. Moreover, social resistance has become more professional throughout the years.
3. Interactions between wind power entrepreneurs and other stakeholders involved, both on the local and national level, determine their opportunities. Positive local capacities, such as a collaborative approach by local authorities, collaborative arrangements between local entrepreneurs and social coherence with regard to wind energy, are important social conditions for the implementation capacity.

In the sections 9.4 and 9.5, we isolated social conditions and institutional conditions. This isolation, however, does not do justice to the empirical observations as described in each of the chapters. We continuously saw interplay between social and institutional conditions. In the next section we will discuss this interplay.

9.6 Interdependencies between social and institutional conditions

With regard to the interdependencies between social and institutional conditions, we focused on changes in institutional conditions and on the consequences for investment behaviour and the possibility to implement wind turbines. Three important observations can be drawn from our study:

1. The mix of institutional conditions can stimulate or constrain the implementation capacity. However, what would be a good mix of conditions relates to the characteristics of an entrepreneurial group.
2. Social conditions can weaken, strengthen, or neutralise negative or positive institutional conditions, and vice versa.
3. There is a continuous dynamic in social and institutional conditions at the local, provincial and national level. This dynamic for the larger part proofs to be an undirected process.

Starting with the first observation, we showed that the performance and position of different types of entrepreneurs can be explained by the mix of institutional and social conditions at national and local level. However, a change in this mix may create an opportunity for one type of entrepreneur, while at the same time creating a barrier for another type of entrepreneur. This is shown in the broader process of liberalisation, which disintegrated the monopoly powers of

energy distributors and simultaneously improved the bargaining position of private power producers. Different implementation capacities for different entrepreneurial groups coexist (there exists no overall implementation capacity). The mix of conditions must be coupled to entrepreneurial characteristics. The question whether institutional conditions are facilitating conditions depends on these characteristics.

Looking at the second observation, we observed that social conditions could weaken, strengthen or even neutralise negative or positive institutional conditions, and vice versa. Weakening of the implementation capacity for energy distributors in the first market period resulted solely from priorities and strategies adopted by energy distributors themselves, and this weakening was strongly related to the problems they encountered in securing sites and permits. These local social conditions neutralised the positive implementation capacity as one might expect in view of the national social and institutional conditions, which were very positive for energy distributors at the time.

The importance of a social setting for the exact working out of institutional conditions is shown in the implementation of the Windmill Axes Plan (a local spatial plan for the implementation of solitary turbines) in the municipality of Zeewolde (as been analysed in chapter 5). Implementation of WAP on a hoc basis and the role in this of the regional Inspector of Housing, Spatial Planning and the Environment illustrates that an institutional condition or structure is not a bottleneck in itself. It is the way stakeholders deal with this institutional structure that clarifies implementation.

As third observation, we have demonstrated the existence of a continuous dynamic in social and institutional conditions at the local, provincial and national level. On the longer term, this dynamic in conditions is an undirected process. Different governments pursue policies, but these are not unambiguous.

We have seen this in the implementation of a favourable fiscal incentive schemes by the Ministry of Economic Affairs around the turn of the century, when simultaneously the Ministry of Housing, Spatial planning and Environment implemented new national planning requirements. The availability of financial incentives stimulated the market, while at the same time the new planning requirements were complicating institutional conditions in project development. The demand to build turbines in business parks or close to highways added new problems to implementation affecting the social conditions. On these locations, more functions and people are present near the turbines, which ask for new types or risk assessments and standards. Moreover, the entrance on the market of new market players as a result of the broader process of liberalisation introduced a more competitive setting. Thus new institutional regulatory and social obstacles at the local level resulted in longer lead-times, being an important barrier for new entrants on the market. New companies needed sufficient resources to hold out long lead-times, which made the onshore wind power market less attractive for newcomers.

9.7 Governance of wind power

In chapter 1, we started with the observation that ex-ante potential studies are a common method used for addressing questions about which conditions trigger investments in renewable (wind)

electricity and which conditions determine the implementation of renewable (wind) electricity projects. These studies are used as input to formulate new policies and they predominantly stress economic and technical conditions to forecast market development. Consequently, priority is given to instruments that improve technical and economic conditions and alter the relative costs of wind power generation and fossil fuel power generation. In our study, we took a different approach: we focussed on the role of social and institutional conditions in determining investment behaviour for different types of investors. We illustrated that the changing mix of social and institutional conditions dictated the degree to which the wind power market emerged and especially the way it developed in terms of entrepreneurial groups. In this section attention is paid to the role of governance in these developments.

Looking at the development of social and institutional conditions and the role of governmental steering over the last 15 years, we notice that governmental policy making has always been based on a very specific interpretation of reality. The renewable energy policy theory mainly comprised (a) ideas about the market structure and the proper type of investor and (b) about the proper type of financial incentive system. This governmental policy theory has resulted in a specific mix of interventions aiming at steering the development of the wind power market and its entrepreneurs.

With regard to steering at the formal institutional framework, policymakers for long focused one-sidedly at strategic energy policies (the broader process of liberalisation) and at changing the financial incentive system, which led to a favourable but variable investment climate towards the end of the 1990s. This favourable investment climate stimulated the market and led to the emergence of new types of wind power entrepreneurs, but the market did not really expand. Institutional regulatory and social problems at the operational level of implementation hampered new market players in implementing projects. Compared to steering at strategic energy policies and financial preconditions, however, steering at problems in planning and permitting procedures has been far less successful. The most important institutional condition (and bottleneck) in the cluster of planning and permitting procedures, the municipal land use plan, remained unchanged. This institutional condition is a very important deviance of the concept of the free market.

Compared to steering at institutional conditions, little attention has been paid to steering at social conditions. We might even say that elaborated ideas about social conditions never occupied an important place in the renewable energy policy theory.

The lengthy tradition of interrelatedness between the Ministry of Economic Affairs and the state-owned electricity sector (energy distributors) set the tone in wind power policy developments in the first half of the 1990s. The focus of central and provincial authorities on large scale applications and the tendency to cooperate with regional energy distributors passed over the limited intrinsic motivation to invest in wind energy by this entrepreneurial group. This governmental focus also disregarded the institutional regulatory and social problems that energy distributors encountered at the local level, i.e. they met with considerably adversary in securing sites and permits.

The interrelatedness between the Ministry of Economic Affairs and distributors became visible in the problem analysis that the government employed halfway the 1990s: securing sites and permits for wind power projects were identified as main problems for wind power market

development. This problem analysis correlated with the problems encountered by distributors (the actor that according to the central authorities should be the main implementer of wind turbines). However, the analysis did not apply to small private investors at the time (the other important entrepreneurial group in terms of projects and capacity installed). Small private investors, compared to energy distributors, met few problems at the operational level of implementation, i.e. the average period required for authorisation of solitary installations by small private investors was relatively short.

Clearly, the government did not go deeply into the question which type of entrepreneur could become a driving force in the market. This, however, was an important question to address, since the market did not comprise a homogeneous set of actors or entrepreneurs. There were different entrepreneurial groups with different mainsprings. It, for instance, might have been fruitful to assess which of these entrepreneurs had the strongest motivation to invest. By mainly focusing on one known entrepreneurial group and facilitating this group institutionally, the government ignored other potential target groups of policy. This mismatch hampered the development of the market, which illustrates the importance of incorporating social conditions in effective policy making on the implementation of wind power.

For long the renewable energy policy theory predominantly focused at strategic energy policies and the financial incentive system, which facilitated only one type of investor: the energy distributors. This was completely at odds with the renewable energy policy theories in Denmark and in Germany at the time, which especially focused at facilitating cooperative or private ownership. In both countries, joint ownership of wind turbines has become a widely spread social phenomenon, supported by strong associations, which have been able to influence national level policymaking.

In the Netherlands, on the contrary, it would be the end of the 1990s before the bargaining power on the market became more balanced between different types of entrepreneurs. This change in power positions occurred due to the broader process of liberalisation, which was induced externally by European developments. The process of liberalisation and the subsequent changes in the wind power market were completely opposite to the original renewable energy policy theory.

Reducing political and administrative bottlenecks by streamlining planning and permitting procedures became an important aspect of wind power policy according to various national memorials at the end of the 1990s. A few interdepartmental steering strategies have been developed at the national level to solve these bottlenecks at the operational level of implementation. Despite these interdepartmental attempts to simplify the authorisation trajectory for wind power projects, planning and permitting procedures remained relatively stable and problems with the implementation of wind energy remained largely unsolved. This brings us to an important observation concerning national governmental commitment. Substantial institutional changes, such as the liberalisation of the electricity market and the introduction of financial instruments, were all induced by the Ministry of Economic Affairs, which is primary responsible for the promotion of a sustainable energy supply and for the development of wind power. We saw, however, that not only national strategic energy policies are relevant for wind power implementation and market development, but also policies and instruments in other policy field, such as land use, environmental policy and nature conservation policy. Other

ministries, with different main interests and targets, are responsible for changes in land use policy and procedures, environmental policy and procedures and nature conservation policy and procedures. These ministries need to solve or remove procedural bottlenecks for wind energy, but removing these bottlenecks interferes with their own main interests. These ministries have been committed to wind energy to a limited extent only. In fact, only the Ministry of Economic Affairs has been committed to the development of wind energy and the renewable energy policy theory can be fully ascribed to this ministry and its steering possibilities.

In addition to this, also a strong countervailing power failed to arise in the Netherlands. We just explained that the government was only partial committed to the development of a strong wind power supply market. The wind sector itself also failed to become a strong countervailing power, able to add new (economic) arguments to environmental arguments in favour of wind energy and to considerably influence national energy policy developments. The different branch organisations for energy distributors on the one hand, and private wind power producers on the other prevented a homogeneous protection of interests.

Lessons for future wind power policy

We conclude this section with a reflection on issues to be considered in the design of future wind power policy, translating our main findings into five basic recommendations.

- The wind power supply market is characterised by a subdivision in different types of wind power entrepreneurs. Our *first recommendation* is to always take the heterogeneity of the market (or the target group of a policy) as the central point of departure in the renewable energy policy theory. By restricting the focus of the renewable energy policy theory to one selected entrepreneurial group, composed of a limited number of large firms, the potential of new, more flexible and creative market players is ignored. Effective policy making on the implementation of wind power should start with identifying the potential of different market players and their characteristics and use this analysis to design strategies that accommodate the potentials of the most motivated groups. This recommendation is especially significant given the growing importance of small private investors and new independent wind power producers on the wind power supply market, which contradicts the emergence of strong business concentrations in the liberalising electricity markets at the European level. Securing the possibilities of these small, flexible and creative market players, within the setting of a liberalised electricity market should be an important policy point of departure.
- The *second recommendation* relates to the observation that the renewable energy policy theory should include explicit trade-offs with regard to institutional and social conditions. A specific institutional instrument or a specific argumentation at the national level proofs to be useless if it contradicts local social conditions. Congruence between the national renewable energy policy theory and local interests, motivations and initiatives is a vital pre-condition for effective implementation. Our second recommendation therefore is to explicitly test the renewable energy policy theory with regard to gaps or tensions in steering at different levels of government.
- Our *third recommendation* is that at the national level a clearly communicated and broadly supported commitment to wind power implementation should be established. The renewable energy policy theory should be a co-product of different ministries and other government authorities, and a coherent view in line with this policy theory should be actively shown to the public, the market and to other authorities.

- Our fourth recommendation is that the use of ex ante potential studies stressing economic and technical conditions should be supplemented with *social potential studies* in order to design 'smart policies'. Smart policies explicitly include ideas about social and institutional conditions on different levels of government. Designing smart policies, systematically incorporating social and institutional conditions and heterogeneity in the market in the policy making process, requires further methodology development. This study is a first attempt to systematically typify important social and institutional conditions in order to create a gross list of variables to be used in social potential studies. Future studies, using the implementation capacity concept, should examine market developments of other renewable energy technologies in the Netherlands and abroad.
- Finally, our *fifth recommendation* refers to the creation of stable conditions. Our study illustrates that a stable investment climate and positive national conditions must be complemented with entrepreneurial capacities, such as knowledge and resources, and positive local capacities, such as a cooperative approach by local authorities. Long lasting local level policy making processes and long lead-times as a result are important risks for (new) market players. Insecurity of the financial support system at the national level as an additional risk is therefore unacceptable. Our recommendation therefore is to secure a stable investment climate for the target groups of wind power policy as identified by social potential studies.

9.8 Using the implementation capacity concept

Coming nearly to the end of this thesis we will now reflect on our analytical perspective and the use of the concept of implementation capacity. A clear distinction exists between utilising this concept in research and utilising the concept for policy making. Apparently troublesome about using the concept for policy recommendations is its dynamic character. To reach an accelerated implementation of renewable energy sources, a continuous high level of implementation capacity is required; i.e. government policy needs to facilitate a high level of implementation capacity over the long term. Consequently, a contradiction exists between using the concept in research and using the concept in (short term) policymaking. This study stresses the dynamic character of the concept, while policymakers would want to create a permanent high implementation capacity. This tension arises from the character of our research object. As scientists, we cannot study investment behaviour and the performance of entrepreneurs within an experimental setting with controlled conditions. We also cannot create a market situation with all relevant conditions being controlled.

For researching a complex and dynamic reality, the concept turned out to be useful. A standard recipe for analysing dynamic processes is difficult, because of the continuous change in circumstances. We therefore adopted a mix of methods to establish the implementation capacity for different types of investors over the long term. This long-term perspective enabled us to analyse long-term dynamics in the market. We effectively showed that a continuous focus on implementation in its social and institutional context is essential for coping with the challenges for an accelerated implementation of renewable energy sources. We demonstrated that the changing mix of social and institutional conditions dictated the degree to which the wind power market emerged and especially the way it developed in terms of entrepreneurial

groups. On the basis of these findings we recommend the use of our analytical perspective and the implementation capacity concept in a variety of social potential studies. The implementation capacity concept may be used for cross-national comparison between markets, and for analysing market developments of other renewable energy technologies. It might for instance be fruitful to analyse the implementation capacities for different types of investors in biomass or solar panels. Analysing the renewable energy policy theory with regard to the stimulation of biomass electricity generation may reveal gaps or tensions in steering at different levels of government, which hamper the implementation capacity for (potential) entrepreneurs. These social potential studies can serve to systematically typify important social and institutional conditions on different levels of government in order to design smart policies.

Such smart policies will be needed to achieve the substantial goal of a transition to a non fossil fuel based energy infrastructure, which is required for addressing the climate impacts of fossil fuel based economies and addressing the geo-political impacts of depleting resources. A social science perspective will be indispensable in this.

Note

1 The environmental permit was replaced by the PIEMD-registration (registration according the Provisions and Installations Environmental Management Decree).

Appendixes

Appendix 2.1

List of persons interviewed: table 1

Policymakers/civil servants at different levels of authority			
Personal communication or telephone communication			
1.	Bakker, P.	Province of Noord Holland	2002
2.	Boomsma, H.W.	Ministry of Economic Affairs	2002
3.	Broertjes, J.	City councillor municipality Zeewolde Farmer municipality Zeewolde	2004
4.	Dicke, J.J.	Province of Flevoland	2004
5.	Heuvel van der, R.	Ministry of Transport, Public Works and Water Management	2002
6.	Hondebrink, P.	Ministry of Economic Affairs	2002
7.	Horst ter, W.	Province of Groningen	2005
8.	Littel, A.	Ministry of Housing, Spatial Planning and the Environment	2002
9.	Loo van der, A.	Novem	2002
10.	Matthijsse, D.J.	Municpality Zeewolde	2002
11.	Muijlwijk van, M.	Municipality Veendam	2005
12.	Steijaert,	Municipality Terneuzen	2005
Email communication			
13.	Arnoldie, M.	Municipality Noordoostpolder	2003
14.	Katipana, G.	Municipality Zeewolde	2003
15.	Neger, E.	Municipality Zeewolde	2003
16.	Vos, C.	Municipality Zeewolde	2003
Energy distributors			
Personal communication or telephone communication			
17.	Bakema, G.F.	Essent	2002/2005
18.	Dingemans, J.	Eneco	2005
19.	Steen van der, G.	Nuon	2003
20.	Pater, J.	Nuon	2002
Small private investors			
Personal communication or telephone communication			
21.	Beije, P.	Farmer municipality Lelystad -Province of Flevoland	2004
22.	Bus-Raymakers, W.	Association of Wind Turbine Owners in Noord Holland	2002
23.	Ghysels, H.	WLTO Committee Renewable Energy	2005
24.	Hempenius, Y.	Association of Wind Turbine Owners in Friesland	2005
25.	Maliepaard	Association Wind Turbine Owners IJsselmeergebied Farmer municipality Zeewolde -Province of Flevoland	2002
26.	Middelkamp, J	Farmer municipality Zeewolde	2003
27.	Schuur, J.	Association Wind Turbine Owners in Groningen Representative PAWEX	2005

Wind cooperatives (see also table 2)

Personal communication or telephone communication

28.	Kruize, E.	Cooperative Noordenwind	2004
29.	Middelbos, A.	Cooperative Deltawind	2004
30.	Tieleman, M.	Cooperative Deltawind	2004
31.	Springer, J.	Cooperative Zeeuwind	2003
32.	Vliet van, F.	Cooperative De Windvogel	2004

New Independent Wind Power Producers and consultants

Personal communication or telephone communication

33.	Bosch, G.	Geert Bosch Management & Advies	2005
34.	Borch van der, R.	Ecofys	2002
35.	Brügeman, D.I.	Joule Consult	2002
36.	Ham van der, D.	Stichting Wind Energie Nederland	2003
37.	Herrmann, A.	Prodeon	2005
38.	Langenbach, J.	Wind Service Holland	2005
39.	Meerkerk, W.	Wilde Wind	2002
40.	Nijenhuis, H.	E-Connection	2002
41.	Steeg van der, A.	WEOM	2002
42.	Timmer, P.	WEB/MEA	
43.	Vermeulen, A.	Groenraedt	2005
44.	Wolff de, C.	De Wolff Nederland Windenergie	2005
45.	Zwol van der, A.	Koop Duurzame Energie	2002

Email communication

46.	Maat, H.	Groenraedt	2003
47.	Pueper, M.	Groenreadt	2003

National wind associations

Personal communication and/or email communication

48.	Kortenoever, M.	PAWEX	2005
49.	Ogg, F.	ODE	2006

Anti associations

Personal communication

50.	Jongedijk, A.	Gjin Romte Foar Wynhannel	2005
51.	Mollet, J.	National Critical Platform Windenergy	
52.	Nauta, H.	Gjin Romte Foar Wynhannel	2005
53.	Swerver, S.	Anti committee 'A2 windmolens Nee'	2004
54.	Zwarberg, H.	Windhoek	2002

Remaining

Personal communication

55.	Backes, Ch. W.	Professor Faculty of Law, (European) Environmental Law	2004
56.	Vries de, E.	Wind technology correspondent 'Duurzame Energie'	2003

List of persons interviewed: table 2
Interviews within the framework of the Master's thesis of Loes van Loenen

Personal communication			
1.	Haan de, mr.	Municipality Woenseradiel	2002
2.	Paasman, mr.	Municipality Zijpe	2002
3.	Beets, D.	ZEK Zaanse Energie Koöperatie	2002
4.	Coelingh, J.	Uwind	2002
5.	Kap, G.	Noordenwind	2002
6.	Kersten, W.	Cooperative Noord Brabant	2002
7.	Schouten, K.	West Friese Windcoöperatie	2002
8.	Stoop, W.B.	Kennemerwind	2002
9.	Tieleman, M.	Deltawind	2002
10.	Verhulst, A.	De Windvogel	2002
11.	Vliet van, F.	De Eendragt	2002
12.	Wiezer, F.	ODE	2002

List of persons interviewed: table 3
Interviews within the framework of the Master's thesis of Marieke van Duyn

Personal communication			
1.	Deen van der, I.	SenterNovem	2004
2.	Hallie, F.	Ministry of Transport, Public Works and Water Management	2004
3.	Ham, van der, T.	LSOW National Steering committee Development Wind power	2004
4.	Hondebrink, P.	Ministry of Economic Affairs	2004
5.	Klep, P.	Municipality Etten-Leur	2004
6.	Kraaier, R.	Province of Utrecht	2004
7.	Littel, A.	Ministry of Housing, Spatial Planning and the Environment	2004
8.	Pluym van der, M.	Eneco	2004
9.	Roode, T.	Municipality Abcoude	2004
10.	Samson, D.	Member of Dutch Parliament for the Social Democrats	2004
11.	Sennema, J.	Ministry of Defence	2004
12.	Steen van, C.	Municipality Schijndel	2004
13.	Vaandrager, A.	Ministry of Agriculture, Nature and Food Quality	2004
14.	Vis, J.	The Netherlands Society for Nature and Environment	2004
15.	Vliet van R.	Association of Netherlands Municipalities	2004
16.	Vlot, J.	Municipality Houten	2004

List of persons interviewed: table 4
Interviews within the framework of the Master's thesis of Muriel van der Hulst

Personal communication			
1.	Akker van den, S.	Stichting de Noordzee	2004
2.	Baretta, M.	Stichting de Noordzee	2004
3.	Bruijne de, R.	Novem	2004
4.	Dekkers, J.	WEOM	2004
5.	Gool van, S.	RWS Directie Noordzee	2004
6.	Kortenoever, M/	E-Connection	2004
7.	Leeuwen van, R.	Greenpeace	2004
8.	Littel, A.	Ministry of Housing, Spatial Planning and the Environment	2004
9.	Olthoff, J.	Nuon	2004
10.	Remmels, W.	Ministry of Agriculture, Nature and Food Quality	2004
11.	Samson, D.	Member of Dutch Parliament for the Social Democrats	2004
12.	Tonneijck, S.	Ministry of Economic Affairs	2004
13.	Vis, J.	The Netherlands Society for Nature and Environment	2004
14.	Westra, C.	We@sea	2004
15.	Wittenboer van den, W.	SenterNovem	2004
16.	Zuylen van, E.	Evelop	2004

Appendix 2.2

Exploratory survey among energy distributors (1), new independent wind power producers (2) and consultants in the field of renewable energy (3).

Name company		Respondent	
1.	CEA (3)	Tieleman, M.	2001
2.	Ecofys (2) (3)	Sluijs, Q.	2001
3.	E-Connection (2) (3)	Anonymous	2001
4.	ECN (3)	Kooijman, H.J.	2001
5.	Eneco (1)	Dingemans, J.	2001
6.	Essent (1)	Bakema, G.	2001
7.	Eurowind (3)	Tweel van der, W.	2001
8.	GEN Renewable Energy Projects (1) (2)	Kloet, R.	2001
9.	Grontmij (2)	Meer van der, H.	2001
10.	Joule Consult BV (3)	Brügeman, D.I.	2001
11.	KEMA Power Generation & Sustainables (3)	Verheij, F.	2001
12.	Koop Duurzame Energie (2)	Zwol van, A.	2001
13.	kWind BV (2) (3)	Jans, R.	2001
14.	Maliepaard Windenergie BV (2)	Maliepaard, K.M.	2001
15.	MEA (3)	Timmer, P.	2001
16.	Nuon (1)	Pater, J.	2001
17.	Shell WindEnergy BV	Rooijen den, H.P.	2001
18.	Siemens Nederland NV (2) (3)	Luijendijk, R.	2001
19.	WEOM BV (2) (3)	Steege ter, A.	2001
20.	WNW De Wolff (2) (3)	Wolff de, C.	2001

Appendix 2.3

Survey among wind cooperatives

Name wind cooperative		Respondent	
1.	Coöperatieve Windmolen Vereniging *Delft*	Stam, I. and Veerman, K.	2004
2.	Coöperatie *Deltawind* u.a.	Middelbos, A.	2004
3.	Heldersche Coöperatieve Windmolen Vereniging *De Eendragt* u.a.	Vliet van, F.	2004
4.	Coöperatieve Windenergie Vereniging *Kennemerwind* u.a.	Stoop, W.B.	2004
5.	Coöperatieve Windenergie Vereniging *Meerwind* u.a.	Marsman, A.	2004
6.	CVCW *Noord-Brabant* u.a.	Kersten, W.	2004
7.	*Noordenwind*, Vereniging tot collectief windmolenbezit Noord Nederland	Kruize, E.	2004
8.	*Uwind* u.a.	Coelingh, J.	2004
9.	Coöperatieve Windmolenvereniging *Waterland*	Visser, P.	2004
10.	Wind Duurzame Energie *WDE*	Lee van der, W.	2004
11.	Westfriese Windmolen Coöperatie u.a. *WWC*	Anonymous	2004
12.	Coöperatieve Vereniging *De Windvogel*	Hoogendoorn, J.	2004
13.	Coöperatieve Windmolenvereniging *Zeeuwind*	Springer, J.	2004
14.	Zaanse Energie Koöperatie u.a. *ZEK*	Anonymous	2004

* *Italic* = nickname

Appendix 3.1

Governmental financial support measures applicable for wind energy (implemented before 1996).
All amounts are nominal, i.e. not adjusted for inflation

Period	Authority	Instrument	Description
1978-1987	Ministry of Economic Affairs	Investment subsidy	*WIR Investment Regulation Act;* a general investment subsidy of 30-35% on investment costs. WIR aimed at reducing negative environmental consequences of economic growth.
1986-1990	Ministry of Economic Affairs	Investment subsidy	*IPW Integral Program on Wind energy*; the first governmental programme with an investment subsidy specifically for wind turbine buyers. The IPW subsidy came into effect in 1986 and had a term of five years. The IPW subsidy was based on installed capacity realised: about 300 per kW in '86 and '87. Subsidies were in the range of up to 35-40% of total project costs, and were allocated according to the first come-first serve principle. IPW aimed at 100-150 MW of wind power capacity installed in 1990.
1991-2000	Ministry of Economic Affairs and energy distributors	Investment subsidy	*MAP Environmental Action Plan Subsidies*; the practical result of a covenant signed in 1990 between the national government and the energy industry to comply with its CO_2-reduction targets. A MAP levy was made available for investments in renewable energy projects.
1991-1993	Ministry of Housing, Spatial Planning and the Environment	Investment subsidy	A relatively small investment subsidy of 21 €//kW for selected locations and for low noise turbines
1991-1994	Ministry of Economic Affairs	Investment subsidy	*Wind Energy Subsidy Decree (WESD)*; an investment subsidy within the framework of the broader research and subsidy program TWIN I 'Application of Wind energy in the Netherlands'. The subsidy was based on swept rotor area and capacity installed: a maximum of 35% on investment costs. Subsidies were allocated according to the first come- first serve principle. In 1993, the limited budget led to a queue of applicants at the door of Novem. Since 1993, a building permit and grid connection agreements must be obtained before applying for the subsidy.
1994 -2005	Ministry of Economic Affairs	Investment subsidy	WESD merged into the *Decree on subsidies for Energy Programs (BSE);* a broad energy investment support programme, which included a variety of renewable energy technologies

Sources: (Dinica & Arentsen, 2001, 2003; Junginger et al., 2004; Kwant & Ruijgrok, 2001; Ministry of Economic Affairs, 2001a, 2001c; Novem, 1996; Wind Service Holland, 2002/2003).

Appendix 3.2

Governmental financial support measures applicable for wind energy (implemented 1996-1997). All amounts are nominal, i.e. not adjusted for inflation

Period	Authority	Instrument	Description
1996-2004	Ministries of Economic Affairs & Finance	Fiscal incentive	*Green Funds*; investors in 'green projects' can obtain financing at lower interest (1.5% lower) from Green Funds. These funds are created from savings of private individuals who are exempted from income tax on the interest received.
1996 -2002	Ministries of Economic Affairs & Finance	Fiscal incentive	*VAMIL scheme*; this scheme offered entrepreneurs a financial advantage because accelerated depreciation was permitted on equipment that was included in the VAMIL list. The accelerated depreciation reduced tax payments on company profits. All energy-related technologies were removed from the VAMIL list in 2003[a].
1996-2005	Ministries of Economic Affairs & Finance	Fiscal incentive; production support	*REB Regulatory Energy Tax (known as eco-tax) (Art. 36o of the Environmental Tax Act*); households and small and medium-sized enterprises (SMEs) pay an energy tax on electricity and natural gas. This tax is paid to energy distributors who pass it on to the tax authorities. Energy distributors are exempted from paying tax on energy generated from renewable energy sources.
1999-2005			Over the period 1998-2002, producers of renewable electricity received 2 €ct/kWh from the revenues of the REB. *REB Regulatory Energy Tax (Art 36i of the Environmental Tax Act);* since January 1999, households and SMEs are exempted from paying the energy tax for electricity from renewable energy sources (both domestic and imported renewable electricity). Tariffs (€ct/kWh, value added tax included): 1999: 2.6; 2000: 4.4; 2001:6.9; 2002: 7.1; 2003: 3.45[b]; 01-01-2004: 3.0; 01-07-2004: 1.5; 2005: -
1997-2003	Ministries of Economic Affairs & Finance	Fiscal incentive	*MIA scheme ' Environmental Investment Scheme'*; this scheme makes it possible to offset investment in technologies against taxable profit. The tax credit offered varies from 52.5% to 40% (depending on the size of investment). In 2003, the MIA was abolished for energy-related technologies
1997-2004	Ministries of Economic Affairs & Finance	Fiscal incentive	*EIA scheme 'Energy Investment Deduction'*; similar to the MIA scheme. Since 2003, in order to apply the EIA the assignment of a building permit for onshore turbines (and a Waterways and Public Works Act Permit for offshore turbines) must be irrevocable first. Since 2005 the EIA has been levelled down for wind energy to a maximum subsidy per kW installed (1100 €/kW for turbines > 25 kW/5000 €/kW for turbines < 25 kW/2250 €/kW for offshore turbines)
1997 -2002	Ministry of Economic Affairs	Investment subsidy	*EINP scheme Subsidy scheme for the Non-Profit Sector*; a subsidy of 14.5-18.5% on investment costs for the non-profit sector (private persons, association, denominations, etc.) [a]

a Because of an overrun on the budget, the VAMIL and the EIA were suspended in early October 2002. The suspension took effect at once. The EIA became available again in January 2003.
b In July 2002, over one million households used renewable electricity. On the basis of an average consumption of 3200 kWh/yr, this amounts to 227 M€ of lost tax income per year, and another 65 M€ of production support. The REB tax exemption was therefore cut by 50% in 2003.
Sources: (Dinica & Arentsen, 2001, 2003; HR House of Representatives, 2004/2005; Junginger et al., 2004; Kwant & Ruijgrok, 2001; Ministry of Economic Affairs, 2001b, 2002; Novem, 2001; PDE, 2001).

Appendix 3.3

Governmental financial support measures applicable for wind energy (implemented 1998-2004). All amounts are nominal, i.e. not adjusted for inflation

Period	Authority	Instrument	Description
1998 -2001	Ministry of Economic Affairs; Energy distributors	Tradable certificate system	*Green labels*; voluntary green label system implemented by the electricity sector. A Greenlabel was issued for each unit of 10.000 kWh of renewable energy delivered to the grid. The system created a free market for green labels between distribution companies, which had to sell a quantified amount renewable electricity of 1700 Gwhe by the end of the year 2000 (MAP -target).
1998 -2004	Ministry of Economic Affairs; Ministry of Housing Spatial Planning and Environment; Ministry of Agriculture, Nature Conservation and Fisheries; Ministry of Transport, Public Works and Water Management	Investment subsidy	*CO_2 Reductionplan*; a special kind of subsidy scheme. Subsidies are distributed on the basis of a tender system. The maximum amount of subsidy is 45% on the investment costs of renewable energy projects.
2001 -2005	Ministry of Economic Affairs	Tradable certificate system	*Green Certificate Trade System*; a voluntary green certificate system based on articles 16 and 31 of the 1998 Electricity Law. The Green Certificates Body – a daughter company of national system operator TenneT- coordinates the system. Green certificates can various sizes, but should be a multitude of 1 MWh. As long as the REB energy tax is maintained, it can be expected that the average price will be around the level of REB36i.
2003-2005	Ministry of Economic Affairs	Production subsidy	MEP Environmental quality of power production; feed-inn tariffs, which are differentiated by RE technology. A fixed surcharge is granted for a period of 10 years or 18.000 full load hours. The MEP is only applicable to electricity produced within the Netherlands.

Tariffs (€ct/kWh)

	1-7-'03	1-1-'04	1-7-'04	1-1-'05	1-5-'5
Onshore	4.9	4.8	6.3	7.7	
Offshore	6.8	6.7	8.2	9.7	moratorium[a]

a The revenues turned out to be 7% less than estimated, due to a miss assessment of the number of electricity connections and the number of connections that were actually leviable (HR 28665, nr. 56, 2005). Consequently, the MEP for offshore wind energy was postponed on 9 May 2005. The postponement took effect at once.
Sources: (Dinica & Arentsen, 2001, 2003; HR House of Representatives, 2004/2005; Junginger et al., 2004; Kwant & Ruijgrok, 2001; Ministry of Economic Affairs, 2001b, 2002; Novem, 2001; PDE, 2001).

Appendix 3.4

Box 1 Procedures applicable to onshore wind turbines in the Netherlands

1. Spatial planning -Municipal Land Use Plan (MLUP)
The MLUP must comply with the Regional Land Use Plan (RLUP) and regulates the precise location, the number of turbines, the maximum height including rotor blades and the ratio of mast height and rotor diameter.
If a project does not fit in with the MLUP, an exemption or revision of that plan is required.

2. Environmental Impact Assessment (EIA)
Until 1999 an EIA was required for projects > 20 MW or > 20 turbines.
Since 1999 projects > 10 MW or 10 turbines must be examined by the competent authorities to establish whether an EIA is required.
Since 2004 projects > 15 MW must be examined by the competent authorities to establish whether an EIA is required.

3. Construction Permit (CP)
The Housing Act requires a CP for wind turbines, which may only and must be refused whenever the project deviates from the conditions of the MLUP, the Buildings Decree and the Building Code.
No decision is taken on the CP until such time as the Environmental Permit (EP) is issued.

4a. Environmental Permit (EP)
Until 2001the Environmental Management Act required an EP for projects with a rotor diameter > 2 meters and/or > 4 kW.
Since 2001 an EP has been required for projects > 15 MW.
Pre-deliberation with the municipality takes place before application. This pre-deliberation is not legally fixed, but is an important instrument for entrepreneurs to assess the prospects of being granted the EP. An application has to be accompanied by data on legally specified environmental and nuisance aspects, such as noise, blade shadow on dwellings, hindrance for birds and safety aspects. In addition, copies of the application for a building permit (if applied for) and technical data on the wind turbines are required.
The EP becomes effective only after a positive decision on the Construction Permit.

4b. Provisions and Installations Environmental Management Decree (PIEMD)
Since 2001 projects < 15 MW with a distance to the nearest dwelling of at least 4 times the mast height no longer need an EP. Registration of such projects at the municipal administrative office is sufficient. This registration must be accompanied by an acoustic report, and the project must comply with legally prescribed standards for safety, blade shadow on dwellings, trembling and glittering. Municipal authorities are allowed to formulate additional requirements for the benefit of the environment

5. Nature Conservation Permit (NCP)
The Nature Conservation Act requires a NCP for actions that may cause damage within or in the direct vicinity of nature reserves.

6. Dispensation under the Law on the protection of Wild Fauna (LWF)
Since 2002 this law requires a dispensation to disturb species, regardless of the specific area they live in.
The LWF is a translation of the species conservation component of the EU Habitats and Bird Directives in Dutch law with regard to all areas that are designated as special protection zones.

7. The EU Birds Directive (79/409/EEC) and the EU Habitats Directive (92/43/EEC)
Because Art. 6 of the Habitats Directive has not been properly transposed into national legislation*, spatial developments can be tested for compliance directly against the directives. Wind turbines cannot be installed within areas designated as protection areas according to the directives and the installation of turbines in the immediate neighbourhood of these areas must be tested against Art. 6 of the Habitats Directive. The situation is unclear with regard to the decisions that have to be tested: for instance at the level of a RLUP or at the level of a CP.

* In May 1998, the European Court condemned the Netherlands for this failure. Until 1997 little attention was paid to the implementation of either directive. Though it was not conform the EU legal framework, observance of the directives was possible through the NCL or through the MLUP. Observance through the application of the NCL with corresponding permit prevailed (Backes, Ch.J. (Professor Environmental Law Utrecht University) Personal communication 24 March 2004.

Box 2 Characteristics of procedures that are applicable to onshore wind turbines in the Netherlands.

Procedure*	Competent authority	Authorisation period	Administrative participation or appeal	Access to procedural stages	Judicial appeal and period
1a. MLUP revision	Determination: Municipal Council Approval: Provincial executives	~ 60 weeks	1x Municipal Council 1x Provincial executive	Open to all**	1x Litigation section of the Council of State 52 weeks
1b. MLUP exemption	Determination: Municipal council Declaration of no objection: Provincial executive	~ 32 weeks	1x Municipal Council	Interested parties	-
2. EIA	Municipal council/ Municipal executive	~ 48 weeks	2 x at competent authority	Open to all	-
3. CP	Municipal executive	~ 12 weeks	1 Municipal executive	Interested parties	1x District Court 1x Litigation section of the Council of State Period: undefined
4a. EP	Municipal executive***	~ 26 weeks	1x Municipal executive	Open to all	1x Litigation section of the Council of State 52 weeks
4b. PIEMD	Municipal executive	~	-	-	-
5. NCP	Determination: Minister of Agriculture, Nature Conservation and Fisheries Assessment by: Municipal executive Provincial executive	~ 3 to 9 months	1 x Minister of Agriculture, Nature Conservation and Fisheries	Interested parties	1x Litigation section of the Council of State 52 weeks
6. LWF	Minister of Agriculture, Nature Conservation and Fisheries	Reasonable period ~ 8 weeks according to the General Administrative Law Act	1 x Minister of Agriculture, Nature Conservation and Fisheries	Interested parties	1x District Court 1x Litigation section of the Council of State Period: undefined

* For abbreviations see Box 1

** In the SPA and the Environmental Management Act, the so-called 'staged actio popularis' has a long-standing tradition, which means that access to official procedural stages is open to everyone. The term 'interested party' in the General Administrative Law Act requires a party to have an interest, but this term needs to be interpreted in a broad sense (Lange de 2003).

*** The municipality is the competent authority, but the provincial executives or the Ministry of Housing Spatial Panning and the Environment are allowed to give a binding indication whenever that is necessary in the public interest.

Appendix 4.1

Projects realised in joint ownership in which energy distributors were involved

Year	Province	Turbines	Capacity (kW)	Ownership	
1990	Zeeland	8	2000	Delta 40%	E-Connection/Triodos 60%
1990	Zeeland	5	1250	Nuon 50%	Delta 50%
1990	Zeeland	2	500	Delta 40%	E-Connection/Triodos 60%
1993	Friesland	1	150	Nuon 50%	De Wolff Nederland Windenergie 50%
1993	Zeeland	8	2000	Delta 40%	E-Connection/Triodos 60%
1995	Friesland	10	5000	Nuon 70%	Farmers 30%
1995	Zeeland	26	13000	Delta 30%	E-Connection/Triodos 70%
1996	Noord Holland	5	3000	Nuon 25%	Farmers 50% Micon 25%
1997	Zeeland	2	450	Delta 40%	E-Connection/Triodos 60%
1997	Zeeland	5	1125	Delta 40%	E-Connection/Triodos 60%
1997	Zeeland	7	1575	Delta 40%	E-Connection/Triodos 60%
1998	Zeeland	7	1120	Delta 50%	Farmers 50%
1999	Zeeland	8	6000	Delta 50%	Farmers 50%
2001	Noord Holland	20	13200	Nuon 40%	De Windgroep Holland BV 60%
2001	Zeeland	3	750	Delta	Wind cooperative Zeeuwind
2002	Noord Holland	12	22000	Nuon 50%	Farmers 50%
2003	Noord Holland	8	14000	Nuon 50%	Farmers 50%
2004	Zuid Holland	9	22500	Eneco 66%	Stanhardt Windenergie BV 33%
Total		146	109620	54000	55620

Appendix 6.1

	Name wind cooperative	Establishment	Province	Current situation
1	Alkmaarse Windmolen Coöperatie	1986	Noord Holland	Merged in 1989 with Kennemerland into Kennemerwind u.a. (11*)
2	Kennemerland	1986	Noord Holland	Merged in 1989 with Alkmaarse Windmolen Coöperatie into Kennemerwind u.a. (11*)
3	Vereniging tot Collectief bezit Windmolens	1986	Friesland	Merged with Noorderwind into Noordenwind (5*)
4	Noorderwind	1986	Groningen	Merged with Vereniging tot Collectief bezit Windmolens into Noordenwind (5*)
5	Noordenwind, Vereniging tot collectief windmolenbezit Noord Nederland	1986	Groningen/ Friesland	In operation
6	Coöperatieve Windmolen Vereniging Delft	1986	Zuid Holland	In operation
7	Westfriese Windmolen Coöperatie u.a.	1986	Noord Holland	In operation
8	Coöperatieve Vereniging tot Collectief bezit Windmolens Noord-Brabant u.a.	1987	Noord Brabant	In operation
9	Coöperatieve Windmolenvereniging Zeeuwind	1987	Zeeland	In operation
10	Coöperatieve Windmolenvereniging Waterland	1987	Noord Holland	In operation
11	Coöperatieve Windenergie Vereniging Kennemerwind u.a.	1989	Noord Holland	In operation
12	Zaanse Energie Koöperatie u.a.	1988	Noord Holland	In operation
13	Coöperatie Deltawind u.a.	1989	Zuid Holland	In operation
14	Coöperatieve Windenergie Vereniging Meerwind u.a.	1989	Noord Holland	In operation
15	Heldersche Coöperatieve Windmolen Vereniging De Eendragt u.a.	1989	Noord Holland	In operation
16	Uwind u.a.	1989	Utrecht	In operation
17	Wind Duurzame Energie	1990	Zuid Holland	In operation
18	Coöperatieve Vereniging De Windvogel	1991	Zuid Holland	In operation
19	Frisse Wind	1991-2001	Noord Holland	Merged with De Windvogel (18)
20	Windenergievereniging De Amstelmolen	1991-2002	Noord Holland	Merged with De Windvogel (18)
21	Hof van Heden	1992-1000	Utrecht	Ceased
22	Schoonstroom	Unknown	Zuid Holland	Merged with De Windvogel (18)
23	Haagse Windmolenvereniging	Unknown	Zuid Holland	Merged with De Windvogel (18)
24	Vereniging voor Duurzame Energie Betuwind	1989-2001	Gelderland	Changed into SGEP[1]
25	Zuidwester	Unknown	Utrecht	Merged with Uwind u.a. (16)

1 The Cooperative of Green Energy Producers (*Samenwerkende Groene Energie Producenten – SGEP*) with the aim to supply their members with green electricity without going through distribution companies or green retailers. SGEP failed however due a diversity of objectives and statutes of the founding cooperatives. Bankruptcy followed in 2003.

Appendix 6.2

Projects realised in joint ownership in which wind cooperatives were involved

Year	Province	Turbines	Capacity (kW)	Ownership	
1995	Noord Holland	15	1200	De Eendragt 13.3%	Farmers 40% Lagerwey BV 46,7%
2000	Zeeland	3	1980	Zeeuwind 66.7%	Delta NV 33,3%
2003	Zuid Holland	12	21000	Deltawind 50%	Promill BV 50%
2004	Zeeland	10	9000	Zeeuwin 20%	Farmers WEOM BV
Total			31950 kW	13780 kW	18170 kW

Appendix 8.1

Familiarity and relative importance of institutional conditions

Wind power entrepreneurs			Local civil servants		
Conditions	**%**	**Fam.**	**Conditions**	**%**	**Fam.**
Ambitious attitude of Municipal Executives and local civil service	27.0	++	Fragmented character of policies and instruments from different policy fields and different governmental levels	16.11	++
Fragmented character of policies and instruments from different policy fields and different governmental levels	17.6	++	Ambitious attitude of Municipal Executives and local civil service	11.67	++
Changes in the financial support system -insecure investment climate	14.3	++	BLOW: adds to administrative élan; does not create new possibilities for wind power entrepreneurs	10.67	++
Height restrictions: inefficient use of locations	9.4	++	Overlap in, and complexity of, procedures and regulation lead to administrative errors	9.78	-
Nationally induced demand for clustering the turbines: involvement of more landowners in project realisation	6.6	+	Height restrictions: inefficient use of locations	9.22	++
BLOW: adds to administrative élan; does not create new possibilities for wind power entrepreneurs	5.2	+/-	New nationally induced requirements from different policy domains add new problems to implementation	7.67	+
Recommendation to locate windturbines on bussiness parks	4.5	+	Nationally induced recommendation to build turbines on business parks	7.56	+/-
Implementation of dualism on the local administrative level	5.0	+/-	Entrepreneurs make sure that projects remain beneath the 15 MW level in the PIEMD.	7.00	+
Discriminating effects of fiscal support system	2.7		Local authorities are guided by expertise and information provided by wind power entrepreneurs	6.89	+/-
Demands in provincial planning policy lead to discriminating effects in the market	3.1	+/-	Nationally induced demand for clustering the turbines: involvement of more landowners in project realisation	6.78	+
Implementation of Provisions and Installations Environmental Management Decree (PIEMD)	3.0	+/-	Demands in provincial planning policy lead to discriminating effects in the market	3.22	-
	1.5	+/-	Implementation of dualism on the local administrative level	2.11	-
	100		The quick scan wind energy provides a surplus of locations	1.33	–

(Appendix 8.1 continued)

Wind power entrepreneurs			Local civil servants		
Conditions	**%**	**Fam.**	**Conditions**	**%**	**Fam.**
Workshop 26 April				100	
The quick scan wind energy provides a surplus of locations	1.0	+/-			
Workshops 12 May					
Entrepreneurs make sure that projects remain beneath the 15 MW level in the PIEMD.	4.5	+/-			
The formal regulation of tariffs and terms for grid connection removes an important barrier for market development	1.4	+			
Statement added by participants of the workshop on 12 May					
Low thresholds for appeal	21.8	++			

Fam. = Familiarity: ++: Strongly corroborated ; +: Mostly corroborated +/-: Diverging experiences -: Mostly refuted –: Strongly refuted

% = We invited each participant to put the institutional and social conditions in order of importance with regard to project realisation and market development. Each participant was asked to allocate a total of 100 points, to be divided over the various conditions. A percentage of 27,0% indicates that 27,0% of all points allocated by the participants have been allocated to that particular condition.

* Participants of the workshop on 12 May used the opportunity to add a statement on institutional conditions. This statement has been taken along in the ranking order of importance of institutional conditions. Relatively, participants attached great value to this statement. In addition, some statements are taken along only in one of the two workshops for entrepreneurs. To keep the results of workshops comparable we corrected for the points allocated to these statements

Appendix 8.2

Familiarity and relative importance of social conditions

Market			Local civil servants		
Conditions	**%**	**Fam.**	**Conditions**	**%**	**Fam.**
The local political attitude is sensitive for the local popular opinion with regard to wind power.	20.7	++	Projects get highly delayed by appellants; but don't fail on formal arguments in the permitting procedures	23.7	++
Projects reach a deadlock on not formally recognised arguments in the local political debate	18.9	++	The local political attitude is sensitive for the local popular opinion with regard to wind power	17.0	++
Projects get highly delayed by appellants; but don't fail on formal arguments in the permitting procedures	12.0	++	Projects reach a deadlock on not formally recognised arguments in the local political debate	15.6	+
Insufficient public communication on the necessity of wind power	11.7	+	Local entrepreneurs may depend on more administrative support, than 'foreign' entrepreneurs	8.4	+
Lack of scope and structure of knowledge with regard to wind power: limited administrative capacity	10.4	++	Lack of scope and structure of knowledge with regard to wind power: limited administrative capacity	7.6	+/-
The trade organisation for wind power is badly organised	10.0		Insufficient public communication on the necessity of wind power	6.4	++
Financial advantage for municipalities leads to administrative support on the local level	5.5	+/-	National policies on wind energy pass over local level planning praxis	6.4	+
Local entrepreneurs may depend on more administrative support, than 'foreign' entrepreneurs	3.8	+	Municipalities are forced to act as a mediator between competing wind power entrepreneurs	5.4	-
Collaboration between landowners and wind power entrepreneurs is a delaying condition in project development	2.7	+/-	Financial advantage for municipalities leads to administrative support on the local level	3.6	+
Insufficient performance of the Dte (Office of Energy Regulation)	2.6	+/-	Collaboration between landowners and wind power entrepreneurs is a delaying condition in project development	3.2	+/-
Rapid emergence of new market parties has been harmful to the local social and administrative support	1.8	–	Rapid emergence of new market parties has been harmful to the local social and administrative support	1.6	–
	100		Local administrative support declines due to high administrative costs for procedures	1.1	–

(Appendix 8.2 continued)

Market			Local civil servants		
Conditions	**%**	**Fam.**	**Conditions**	**%**	**Fam.**
Workshop 26 april				100	
The 'right person at the right time on the right place' at the local governmental level determines the chance for success.	11.1	++			
New nationally induced requirements from different policy domains add new problems to implementation	3.1	+			
Municipalities are forced to act as a mediator between competing wind power entrepreneurs	1.0	–			
Workshop 12 mei					
Joining local and regional economic interests increases the chance for success in project realisation	5.3	+/-			
Local authorities are guided by expertise and information provided by wind power entrepreneurs	3.5	+			
Competition amongst wind power entrepreneurs leads to high kWh costs	3.1	–			
Statement added by participants of the workshop on 12 May					
One-sided negative reporting by the press	10.9	+			
Using the argument of 'negative effects on neighbouring property value' by opponents	10.3	+			

Fam. = Familiarity: ++: Strongly corroborated ; +: Mostly corroborated +/-: Diverging experiences -: Mostly refuted –: Strongly refuted

% = We invited each participant to put the institutional and social conditions in order of importance with regard to project realisation and market development. Each participant was asked to allocate a total of 100 points, to be divided over the various conditions. A percentage of 27,0% indicates that 27,0% of all points allocated by the participants have been allocated to that particular condition.

*Participants of the workshop on 12 May used the opportunity to add a statement on institutional conditions. This statement has been taken along in the ranking order of importance of institutional conditions. Relatively, participants attached great value to this statement. In addition, some statements are taken along only in one of the two workshops for entrepreneurs. To keep the results of workshops comparable we corrected for the points allocated to these statements.

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Samenvatting

Empowering wind power
Over de invloed van sociale en institutionele condities op de prestaties van ondernemers op de markt voor windenergie in Nederland

Dit promotieonderzoek betreft een institutionele analyse van de ontwikkeling van de Nederlandse markt voor windenergie over de periode 1989-2004. De ontwikkeling van de markt voor windenergie is onderzocht vanuit het perspectief van de ondernemer. De institutioneel regulerende dimensie en de sociale context als verklarende variabelen voor de opkomst en prestaties van verschillende typen 'ondernemers in wind' (energiedistributiebedrijven, agrariërs, projectontwikkelaars en windcoöperaties) staan centraal in het onderzoek. Speciale aandacht gaat uit naar de liberalisering van de elektriciteitsmarkt. Het marktaandeel van elektriciteit geproduceerd door windturbines is afhankelijk van ondernemers die initiatieven ontplooien om windprojecten te ontwikkelen. Binnen de setting van een (liberale) energiemarkt als coördinerend mechanisme is overheidssturing noodzakelijk om deze initiatieven te stimuleren. Overheidssturing moet de energiemarkt een maatschappelijk institutioneel kader meegeven zodat sociale en milieukosten tot uitdrukking komen. Dit kader bestaat uit wetgeving, nota's, planning -en vergunningenprocedures op het gebied van energie, ruimtelijke ordening en milieu en komt tot stand binnen een maatschappelijk en politiek krachtenveld. De centrale onderzoeksvraag luidt als volgt:

Hoe en in welke mate hebben sociale en institutionele condities de opkomst en prestaties van ondernemers op de markt voor windenergie beïnvloed en welke lessen kunnen daaruit getrokken worden voor toekomstig windenergiebeleid?

Analytisch perspectief en de implementatiecapaciteit
Er is gekozen voor een institutionele benadering voor de bestudering van de opkomst en de prestaties van verschillende typen ondernemers. De focus van het 'nieuw institutioneel perspectief' betreft de wisselwerking tussen gedrag, voorkeuren en belangen van individuele actoren enerzijds, en de mogelijkheden en beperkingen zoals verankerd in de 'geïnstitutionaliseerde omgeving' waarbinnen deze actoren werkzaam zijn anderzijds. Deze wisselwerking vormt de kern van het onderzoek. Het nieuw institutioneel perspectief heeft als uitgangspunt gediend bij de ontwikkeling van een conceptueel model waarmee de dynamiek in de markt, de rol van ondernemers, hun kenmerken en prestaties en de rol van overheidssturing zijn geanalyseerd.

Het uiteindelijke resultaat van investeringsgedrag, in termen van geplaatst windvermogen, is geanalyseerd met behulp van een kwalitatief concept: de *implementatiecapaciteit* (IC). De implementatiecapaciteit is een heuristische maat voor de mogelijkheid die een ondernemer heeft om windturbines te implementeren binnen een 'geïnstitutionaliseerde omgeving'. Deze omgeving

is opgebouwd uit relevante contextuele condities -technische, economische, institutionele en sociale condities. Deze condities beïnvloeden besluitvorming van ondernemers aangaande investeringen in wind en bepalen de mogelijkheden van ondernemers om daadwerkelijk een windenergie project te realiseren. Elk type conditie vormt een noodzakelijke maar op zichzelf onvoldoende voorwaarde voor het implementeren van windturbines. De IC is een kwalitatieve variabele, die het mogelijk maakt om variaties in tijd in de prestaties van verschillende typen ondernemers te beschrijven en te verklaren. Om (veranderingen in) de IC te analyseren hebben steeds veranderingen in twee groepen condities en onderlinge afhankelijkheden centraal gestaan:

De eerste groep condities bestaat uit institutionele condities. Het institutionele kader bestaat uit het geheel aan formele regelgeving en beleid, dat van invloed is op de plaatsing van turbines door marktpartijen. Het gaat om (inter)nationale wetgeving, nota's, planningsprocedures en vergunningenprocedures op het gebied van energie, ruimtelijke ordening en milieu.

De tweede groep condities zijn sociale condities. Sociale condities betreffen de uitvoering van en/of omgang met het institutionele kader, de belangen en percepties van actoren en samenwerking of concurrentie tussen stakeholders, zoals investeerders, ontwikkelaars, en ergiedistributiebedrijven, de netbeheerder, omwonenden, natuur -en milieuorganisaties, brancheorganisaties en diverse overheden.

Ten derde richt het onderzoek zich op de onderlinge wisselwerking tussen institutionele en sociale condities. De nadruk ligt op veranderingen in institutionele condities en op de consequenties van deze veranderingen voor investeringsgedrag en de mogelijkheden tot het implementeren van windturbines.

Actoren op de Nederlandse elektriciteitsmarkt en in de windenergie voorziening

Hoofdstuk 3 geeft een beknopt overzicht van de rollen en posities van actoren op de elektriciteitsmarkt in Nederland. Bij de behandeling van de belangrijkste categorieën van actoren en hun onderlinge relaties wordt in het bijzonder aandacht besteed aan het implementeren van windenergie door verschillende typen ondernemers. De verschillende ondernemerscategorieën hebben te maken met ontwikkelingen in Europees en nationaal energiebeleid. Daarnaast moeten ze omgaan met ontwikkelingen in andere beleidsvelden. Immers, projectontwikkeling -het daadwerkelijk plaatsen van windmolens – vindt plaats binnen een geheel aan beperkingen voortkomend uit planologisch, milieu en natuurbeleid. De ontwikkelingen in dit institutionele kader zijn beschreven in dit hoofdstuk.

Het hoofdstuk geeft tevens een kwantitatieve analyse van de ontwikkeling van de markt voor windenergie. De door de verschillende typen ondernemerscategorieën geplaatste projecten, turbines en capaciteit is in kaart gebracht. Het hoofdstuk besluit met een onderscheid in drie opeenvolgende marktperioden: *Monopoly powers (1989-1995), Interbellum (1995-1996)* and *Free market (1998-2004)*. Dit onderscheid is gebaseerd op veranderingen in het institutionele kader, op veranderingen in de relaties tussen de belangrijkste categorieën van actoren op de elektriciteitsmarkt en op implementatiepatronen van de verschillende ondernemerscategorieën.

De markt voor windenergie

De opkomst van vier verschillende typen ondernemerscategorieën vanaf het eind van de jaren '80 kenmerkt de Nederlandse markt voor windenergie:

1. *Kleine private investeerders* (voornamelijk agrariërs)*:* de exploitatie van windenergie is een aanvullend inkomen voor deze ondernemersgroep. De kern activiteit ligt buiten de energie sector.
2. *De elektriciteitssector* (energiedistributiebedrijven): de exploitatie van windenergie vormt een kleine maar groeiende handelscomponent voor deze bedrijven. De kern activiteit bestaat uit de productie en verkoop van een portfolio aan (hernieuwbare) energiebronnen.
3. *Wind coöperaties:* de exploitatie van windenergie is voor deze ondernemersgroep niet zozeer een manier om inkomsten te genereren, maar een manier om een bijdrage te leveren aan de ontwikkeling van een duurzame samenleving.
4. *Nieuwe onafhankelijk wind producenten (projectontwikkelaars):* de exploitatie van windenergie vormt een (nieuw) onderdeel van hun kern activiteiten, die veelal gerelateerd zijn aan de hernieuwbare energie sector.

Verschuivingen hebben plaatsgevonden in het relatieve belang van deze ondernemerscategorieën. Aan het begin van de jaren '90 *(Monopoly power 1989-1995*) werd de markt gedomineerd door energiedistributiebedrijven. Wanneer we onze blik verleggen naar de afgelopen 10 jaar zien we een ander beeld. Agrariërs blijken absolute koplopers: het grootste deel van de sinds 1998 *(Free market 1998-2004)* geplaatste capaciteit is in eigendom van de agrarische sector. Ook het relatieve belang van projectontwikkelaars is aanzienlijk toegenomen en overtreft het belang van energiebedrijven sinds een aantal jaren. Tot aan het eind van de jaren '90 werd de markt gedomineerd door ondernemers die hun activiteiten beperkten tot een vooraf bepaald gebied. Projectontwikkelaars waren feitelijk de eerste ondernemersgroep die concurreerden om locaties in het gehele land. Ten slotte is het gefragmenteerde karakter van de windlobby een kenmerk van de markt. Drie verschillende brancheorganisaties zijn opgericht aan het eind van de jaren '80: een brancheorganisatie voor windturbine fabrikanten, een organisatie voor energiedistribut iebedrijven en een belangenorganisatie voor particuliere producenten. Het gefragmenteerde en antagonistische karakter van de markt verhinderde een homogene belangenbehartiging.

Case studie onderzoek

De hoofdstukken 4 tot en met 7 zijn case studies met betrekking tot de opkomst en prestaties van de 4 ondernemerscategorieën. De cases verschaffen inzicht in de wijze waarop sociale en institutionele condities van invloed zijn geweest op de implementatiecapaciteit van de verschillende typen ondernemers in elk van de onderscheiden marktperioden.

De cases illustreren dat beleidsvorming en planning van de elektriciteitssector op nationaal niveau van invloed zijn geweest op de ontwikkeling van de markt; de geplaatste capaciteit door verschillende typen ondernemers. Nieuwe type ondernemers zijn opgekomen en verschuivingen hebben plaatsgevonden in marktaandelen van de verschillende ondernemerscategorieën. Echter niet alleen het strategische energiebeleid en bijbehorende instrumentarium blijken relevant voor de ontwikkeling van de markt. Projectontwikkeling -het daadwerkelijk plaatsen van windmolens – vindt plaats binnen een geheel aan beperkingen voortkomend uit andere beleidsvelden (planologisch, milieu en natuurbeleid). Deze beleidsvelden zijn niet primair gericht op het stimuleren van windenergie, maar op het veilig stellen van andere publieke belangen (bijvoorbeeld landschapskwaliteit). Beleid en instrumenten van deze beleidsvelden komen samen op het operationele niveau van het implementeren van turbines en vormen het institutionele kader waarbinnen ondernemers en andere belanghebbenden in windprojecten opereren.

De case studies laten zien dat positieve nationale en institutionele condities op zichzelf onvoldoende zijn, maar aanvulling behoeven van specifieke ondernemerscapaciteiten, zoals kennis en financiële middelen, en van een proces van lokale capaciteitsopbouw. Lokale capaciteitsopbouw is een in de tijd begrensd proces waarin het belang van sociale condities prevaleert. Lokale sociale relaties, zoals relaties met lokale autoriteiten en vertrouwensrelaties tussen belanghebbenden faciliteren samenwerkingsverbanden, dragen bij aan de verspreiding van kennis en aan de onderhandelingspositie van investeerders op de markt.

Ten slotte laten de cases zien dat de implementatiecapaciteit een tijdelijke capaciteit is. Een situatie van positieve sociale en institutionele condities op een bepaald moment in de tijd, met een bijbehorende hoge implementatiecapaciteit voor een bepaald type ondernemer, moet worden begrepen als een moment waarop niet alleen nationale condities positief zijn, maar waarop ook aan de opbouw van vereiste lokale capaciteiten is voldaan.

Validatie workshops

De resultaten uit de case studies zijn besproken in drie validatie workshops. Investeerders in windenergie en actoren uit de lokale beleidspraktijk hebben gereflecteerd op stellingen die gebaseerd zijn op uit de cases voortgekomen inzichten met betrekking tot sociale en institutionele condities tijdens het implementatieproces, en met betrekking tot veranderingen in strategisch beleid. Er is gereflecteerd op de gevolgen van gefragmenteerd sectoraal en inconsistent beleid, op de vergunningprocedures en de lage drempel voor bezwaar en beroep, op de achtergronden van sociale weerstand, op de organisatie van de windsector, op (eenzijdige) negatieve berichtgeving in de pers, op de (gebrekkige) communicatie van overheidszijde over de noodzaak van windenergie en op het belang van het lokaal politieke debat. Uit de workshops kwam naar voren dat de probleemanalyse van de deelnemende marktpartijen grotendeels overeenkomt met die van de deelnemende ambtenaren: het veelvuldig vastlopen van projecten op niet formeel toetsbare (emotionele) argumenten in de lokale politiek in combinatie met de gevoeligheid van raadsleden voor de publieke opinie, maken de fase voorafgaand aan een eventueel voorbereidingsbesluit en voorafgaand aan de feitelijke vergunningaanvragen meest kritisch voor de slaagkans van een project. De meningen ten aanzien van oplossingen voor beleidsmatige en sociale knelpunten in projectontwikkeling bleken aanzienlijk te verschillen. Beleidsmedewerkers legden de meeste nadruk op het belang van voorlichting -en bewustwordingsactiviteiten en een projectmatige bottom-up gedreven benadering via open planprocessen: een pleidooi voor een strategische benadering van de problematiek. Marktpartijen benadrukten echter juist het beperken van de mogelijkheden van bezwaar en beroep en het vereenvoudigen en inkorten van de procedures: een pleidooi voor een meer operationele oplossingsrichting, gericht op procedurele knelpunten tijdens projectrealisatie.

Institutionele en sociale condities

De case studies laten zien dat verschuivingen in het belang van de verschillende ondernemerscategorieën, de verschillen in ontwikkeling en prestaties, te maken hebben met verschillen in ondernemerskenmerken en met veranderingen in nationale en lokale sociale en institutionele condities.

De invloed van institutionele condities, die het interactieve gedrag van actoren structureren, en die de mogelijkheden en beperkingen voor het implementeren van turbines bepalen, is geanalyseerd. Het formele institutionele kader omvat wetgeving, beleid, procedures en instrumenten die bepalend zijn voor (1) de positie van actoren op de elektriciteitsmarkt, (2) de rentabiliteit van een project en (3) de planning of vergunningverlening van een project. De belangrijkste institutionele veranderingen in deze drie clusters zijn:

1. Een transitie van een monopolistische marktstructuur, waarbinnen strategisch windenergiebeleid en het bijbehorende financiële stimuleringsinstrumentarium eenzijdig energiedistributiebedrijven stimuleerden, naar een geliberaliseerde markt met een verbeterde onderhandelingpositie voor private producenten.
2. Een transitie van een stimuleringssysteem gebaseerd op subsidies met een centrale rol voor energiedistributiebedrijven, naar een systeem van fiscale stimuleringsmaatregelen, welke gelijke mate toegankelijk is voor private producenten als voor energiedistributiebedrijven.
3. Ondanks het gefragmenteerde en complexe karakter van het proces van vergunningverlening, zijn planning – en vergunningenprocedures relatief constant gebleven. De belangrijkste institutionele verandering is de eis tot clustering, welke een groter nadeel lijkt te vormen voor kleine private investeerders en windcoöperaties dan voor energiedistributiebedrijven en nieuwe onafhankelijke producenten.

Wat betreft sociale condities is het interactieve karakter van voorkeuren en gedrag van investeerders in windenergie en andere belanghebbenden geanalyseerd. De context van sociale condities omvat (1) kenmerken van de ondernemersgroep, (2) de sociale context bestaande uit belanghebbenden en hun percepties en (3) de interacties tussen investeerders en andere belanghebbenden.

1. De verschillen in ontwikkeling en prestatie kunnen gedeeltelijk verklaard worden door verschillen in ondernemerskenmerken. De belangrijkste onderscheidende kenmerken zijn de motivatie om te investeren in windenergie, de mate van professionalisme, en de positie van windenergie als investeringsoptie binnen de onderneming.
2. Belanghebbenden met toegang tot het lokale besluitvormingsproces veroorzaken vertraging in de planning van projecten. Projecten lopen vast op het lokale politieke debat over het al dan niet in procedure nemen van het betreffende project. Een raad hoeft zich niet formeel te verantwoorden voor de beslissing die ze neemt, waardoor niet formeel toetsbare "emotionele" argumenten doorslaggevend kunnen zijn. Een confrontatie van ideeën over het nut, de noodzaak en de (lokale) kosten van windenergie domineren het lokale politieke debat. Deze confrontatie van ideeën is riskant voor ondernemers.
3. Interacties tussen investeerders in windenergie en andere belanghebbenden, zowel op het lokale als nationale niveau, zijn bepalend voor de implementatiecapaciteit. Lokale sociale condities, zoals medewerking door lokale overheden, samenwerkingsverbanden tussen lokale ondernemers en sociale coherentie met betrekking tot windenergie, zijn belangrijk voor de implementatiecapaciteit.

Onderlinge verwevenheid van sociale en institutionele condities
Het isoleren van institutionele en sociale condities doet geen recht aan de empirische observaties zoals beschreven in elk van de case studies. Een voortdurende wisselwerking tussen sociale en institutionele condities is geobserveerd:

1. Het formeel institutionele kader kan de implementatiecapaciteit zowel versterken als beperken. Wat een goede mix van institutionele condities is hangt af van de specifieke ondernemerskenmerken.
2. Positieve institutionele condities kunnen aan kracht inboeten, geneutraliseerd worden, of juist versterkt worden door sociale condities en omgekeerd. Een institutionele conditie is op zichzelf geen belemmering. Het is de wijze waarop belanghebbenden omgaan met deze conditie wat de implementatiecapaciteit bepaalt.
3. Er is sprake van een voortdurende dynamiek in sociale en institutionele condities op lokaal, provinciaal en nationaal niveau. Deze dynamiek is een grotendeels niet geregisseerd proces.

Sturingsstrategieën voor windenergie
Wanneer we kijken naar de ontwikkeling van sociale en institutionele condities en de rol van overheidssturing over de laatste 15 jaar, dan valt op dat beleidsvorming altijd gebaseerd is geweest op een zeer specifieke interpretatie van de werkelijkheid. De beleidstheorie met betrekking tot duurzame energie bestond voornamelijk uit specifieke ideeën over (a) de structuur van de markt en het geëigende type investeerder en (b) over de meest geschikte financiële stimuleringsmaatregelen. De ontwikkeling van het nationale windenergiebeleid is lange tijd gedomineerd door een besloten coalitie van EZ en energiedistributiebedrijven. Tot eind jaren '90 is weinig tot geen rekening gehouden met de segmentering van de markt in diverse ondernemerscategorieën. Strategisch windenergiebeleid en het bijbehorende financiële stimuleringsinstrumentarium stimuleerden slechts één type ondernemer: het energiedistributi ebedrijf. Deze eenzijdige focus op grootschalige toepassingen door energiedistributiebedrijven ging voorbij aan de beperkte intrinsieke motivatie bij deze ondernemersgroep om te investeren in gedecentraliseerd en fluctuerend vermogen. Het strategische windbeleid veronachtzaamde bovendien de maatschappelijke en procedurele problemen die deze ondernemersgroep ondervond op subnationaal niveau. De implementatietaak werd feitelijk doorgeschoven naar de lokale beleidscontext, waar lokale belanghebbenden een gevecht voerden over de inhoud en vormgeving van een windproject, en de wijze waarop de diverse omgevingseisen daarbij werden gewogen. Het gegeven dat andere ondernemerscategorieën (zoals agrariërs) destijds in veel mindere mate maatschappelijke en procedurele problemen ondervonden bij projectrealisatie kreeg op nationaal niveau lange tijd geen aandacht. Pas aan het eind van de jaren '90 ontstond er meer evenwicht in de machtspositie van de verschillende ondernemerscategorieën op de markt. Deze verschuiving in machtsposities was een direct gevolg van de liberalisering van de markt; op zichzelf weer een gevolg van Europese beleidsontwikkelingen. De liberalisering van de markt en de daarop volgende veranderingen in machtsverhoudingen waren volledig tegengesteld aan de oorspronkelijke beleidstheorie met betrekking tot duurzame energie.

Aanbevelingen voor toekomstig windenergiebeleid
De eerste aanbeveling betreft de segmentering van de markt in verschillende ondernemerscategorieën. Deze segmentering zou expliciet uitgangspunt moeten zijn in de beleidstheorie met betrekking tot duurzame energie. Identificatie van belangrijke karakteristieken en het

potentieel van de verschillende ondernemers op de markt zou ten grondslag moeten liggen aan sturingsstrategieën gericht op het stimuleren van duurzame (wind)energie.

De tweede aanbeveling is om de beleidstheorie met betrekking tot windenergie expliciet te testen op lacunes of spanningen in sturing op verschillende overheidsniveaus. Een specifiek instrument of een specifieke argumentatie op nationaal niveau is nutteloos wanneer deze strijdig blijkt met lokale sociale condities.

De derde aanbeveling is om zorg te dragen voor een duidelijk gecommuniceerd en gedragen verbintenis aan het implementeren van windenergie op nationaal niveau. De beleidstheorie aangaande windenergie dient een co-product te zijn van verschillende ministeries en andere overheidsinstanties, en een coherente visie in lijn met deze theorie moet actief worden uitgedragen aan burgers, de markt en andere autoriteiten.

De vierde aanbeveling is om ex ante potentieelstudies, waarbij de nadruk ligt op economische en technische condities, aan te vullen met *sociale potentieelstudies* als grondslag voor zogenaamde 'smart policies'. Deze 'smart policies' omvatten ideeën over sociale en institutionele condities op verschillende overheidsniveaus.

Een laatste aanbeveling betreft het waarborgen van een stabiel investeringsklimaat voor de doelgroepen van windenergiebeleid, zoals geïdentificeerd in de *sociale potentieelstudies*.

Toepassing van de implementatiecapaciteit

Toepassing van het concept 'implementatiecapaciteit' is vruchtbaar gebleken voor het onderzoeken van een complexe en dynamische realiteit. Met behulp van een mix aan methoden is de implementatiecapaciteit voor verschillende ondernemerscategorieën onderzocht over de lange termijn. Dit lange termijn perspectief heeft het mogelijk gemaakt de lange termijn dynamiek in de markt in kaart te brengen. Aangetoond is dat een voortdurende focus op de sociale en institutionele omgeving essentieel is voor het managen van uitdagingen die gepaard gaan met een versnelde implementatie van duurzame energiebronnen. De case studies laten zien dat de veranderende mix van sociale en institutionele condities bepalend is geweest voor de mate waarin, en de wijze waarop, de markt voor windenergie zich heeft ontwikkeld. Op basis van deze bevindingen wordt geadviseerd een institutionele benadering en het concept implementatiecapaciteit toe te passen in een verscheidenheid aan sociale potentieelstudies. Het concept is geschikt voor internationaal vergelijkende analyses van markten en voor de analyse van de marktontwikkeling van ander duurzame technologieën.

Op basis van deze *sociale potentieelstudies* kunnen belangrijke institutionele en sociale condities op verschillende overheidsniveaus meer systematisch getypeerd worden. Deze sociale potentieelstudies zouden moeten bijdragen aan de ontwikkeling van '*smart policies*' gericht op een transitie naar een duurzame energievoorziening. Een sociaal wetenschappelijk perspectief is hiervoor onontbeerlijk.

Summary

Empowering wind power

On social and institutional conditions affecting the performance of entrepreneurs in the wind power supply market in the Netherlands

This dissertation analyses institutional and social conditions that promote or discourage the implementation of renewable electricity technologies and the application of suitable policy instruments. It focuses on wind energy for electricity generation, analysing the evolution of the wind power supply market in the Netherlands. We analysed different kind of wind power entrepreneurs, their capacity to implement wind energy and the social and institutional conditions that affected their investments over the period 1989-2004. Central in the analyses are the institutional regulatory dimension and the social context as explanatory variables for the emergence and performance of these wind power entrepreneurs. Special attention is given to the liberalisation of the electricity market.
The following core research question has been addressed in this study:

How and to what extent have social and institutional conditions affected the emergence and performance of wind power entrepreneurs in the wind power supply market in the Netherlands, and what lessons can be learned for future wind power policy?

Analytical perspective and the concept of implementation capacity
To realise a shift towards renewable electricity in a liberalised electricity market dominated by fossil fuel electricity generation, it is vital to understand the conditions that prompt entrepreneurs to invest in wind power projects and the conditions that determine the chance of success if these entrepreneurs do implement and exploit their projects. Our analytical perspective to study investment behaviour of wind power entrepreneurs and their capacity to implement wind energy can be referred to as the 'new institutional perspective' and is described in chapter 2. It focuses on the interaction between the behaviour and preferences of the individual actors on the one hand and the opportunities and constraints embedded in the institutional context in which they operate on the other hand. Precisely this interplay is at the heart of our analysis. We used this new institutional perspective to develop an operational research design that enabled us to analyse the dynamics of the wind power supply market, the role of wind power entrepreneurs, their characteristics and performance and the role of governmental steering.

The actual results of investment behaviour, in terms of the amount of wind power capacity actually implemented, has been analysed using the concept of *implementation capacity* (IC). The concept of IC is used as a qualitative variable, which enabled us to describe and explain differences over time in the performances of different types of entrepreneurs. We assumed that the IC is determined by the sum of the relevant economic, technical, institutional and

social conditions and mutual interdependencies. These conditions affect the decisions made by entrepreneurs on investments in wind power and determine the opportunities for entrepreneurs to actually implement wind power projects. Every type of condition is necessary but not in itself sufficient for implementation. To analyse (changes in) implementation capacity, our research specifically focused on two groups of conditions and their interdependencies.

The first group of conditions is the group of social conditions: the interactive nature of the preferences and behaviour of wind power entrepreneurs and other stakeholders involved in wind power implementation.

The second group of conditions is the group of institutional conditions: the constellation of rules that structure the interactive behaviour of actors and determine the opportunities and constraints for wind power entrepreneurs.

Third, our research focuses on the interdependencies between these institutional and social conditions. We focused on changes in institutional conditions and on the consequences of these changes for investment behaviour and the possibility to implement wind turbines.

Actors on the Dutch electricity market and in wind power supply

Chapter 3 presents a short history of the roles and positions of actors on the electricity market. In addressing the positions of these main categories of actors and their essential relationships, special attention is paid to the implementation of wind power generation projects.

The various groups of wind power entrepreneurs have to deal with developments in (inter)national electricity policy. They also have to deal with developments in other policy fields, such as land use, the environment and nature conservation. These policies and instruments from different policy fields converge on the operational level of implementation, and constitute the institutional framework in which wind power entrepreneurs and other stakeholders involved in wind power implementation operate. These institutional conditions are described.

The chapter also provides a quantitative analysis of the development of the wind power supply market in terms of projects, turbines and capacity installed by different entrepreneurial groups over the period 1989 up to 2004. Finally, chapter 3 distinguishes three successive market periods for wind power supply based on changes in institutional conditions, on changes in relationships between the main categories of actors on the electricity market and on the patterns of implementation by the main categories of wind power entrepreneurs. These market periods are *Monopoly powers (1989-1995)*, *Interbellum (1995-1996)* and *Free market (1998-2004)*.

The wind power supply market

As a first characteristic we have seen that the emergence of a wind power supply market in the Netherlands has been the work of four different types of wind power entrepreneurs:

1 *Small private investors* (mainly farmers): Wind power exploitation is a supplementary income for this entrepreneurial group. Their core business lies outside the energy sector.
2 *Electricity sector* (energy distributors): Wind power exploitation is a small but growing business component for these companies. Their core business is producing and selling a portfolio of (renewable) energy sources.
3 *Wind cooperatives*: For this entrepreneurial group wind power exploitation is not a means of making money but a means of working towards a sustainable society.
4 *New independent wind power producers:* (NIWP) Wind power exploitation is a (new) part of their core business, which is most likely related to the renewable energy sector.

Each of these types of entrepreneurs has been active since the end of the 1980s, but they followed very different development paths and performed differently throughout the years. A second characteristic of the wind power supply market is the shift in the relative importance of these four entrepreneurial groups. Energy distributors dominated the market at the beginning of the 1990s (*Monopoly power 1989-1995*), but their role has declined in importance in the course of the years. Since the end of the 1990s *(Free market 1998-2004)*, small private investors have caught up with – and in 2002 even surpassed – energy distributors in terms of capacity installed over the last 15 years. Third, entrepreneurial groups, that restricted their activities to a certain region, have dominated the market until the end of the 1990s. In fact, new independent wind power producers were the first entrepreneurs who competed for locations in the entire country. A final characteristic is the fragmented character of the wind power supply branch representation. Three different branch organisations were created in the 1980s: a branch organisation for wind turbines manufacturers, a wind energy association for energy distributors and a wind union for private wind power producers. This fragmented and antagonistic character of the market prevented a homogeneous protection of their common interests.

Case study research

Chapters 4 to 7 include case studies on the implementation capacity of the four entrepreneurial groups in each of the three market periods. The case studies led to conclusions about the way in which social and institutional conditions affected the implementation capacity of different types of entrepreneurs in each of the three market periods.

The case studies illustrate that the shaping of policies and planning of the electricity sector at the national level has affected the development of the wind power supply market. New wind power entrepreneurs emerged and shifts occurred in market shares of different entrepreneurial groups. However, not only national level strategic electricity policies and instruments, which are developed to stimulate wind power production, are relevant for wind power implementation, but also policies and instruments in other fields such as land use policy and law, environmental policy and law and nature conservation policy and law.

The case studies show that positive national social and institutional conditions must be complemented with entrepreneurial capacities, such as expertise and resources, and a process of local capacity building. Local capacity building is a temporary process in which the influence of social conditions prevails. Local social relations like authority relations and relations of trust, facilitate coordinated actions, add to the scope and structure of knowledge and to the bargaining position of investors on the market. Finally the case studies show that the implementation capacity is a temporary capacity. Positive social and institutional conditions at a certain moment in time, with a corresponding high implementation capacity for a certain type of entrepreneur, must be comprehended as a moment, wherein not only national conditions are positive, but wherein also the required local capacities are fulfilled.

Validation workshops

The results of the case studies have been discussed in three validation workshops with stakeholders involved in wind power implementation in the Netherlands. Two of the workshops involved different types of wind power entrepreneurs (market), and one involved provincial and local authority civil servants (government). In the workshops we analysed the way in which wind power entrepreneurs and local civil servants experience social and institutional conditions in the

operational process of realising wind power projects, and their perceptions of policy implications. From the analysis it was concluded that wind power entrepreneurs and civil servants share the opinion that the institutionally embedded power position of local politicians and the sensitiveness of the local political debate for the popular opinion are most critical for project realisation. With regard to the proposed solutions, both groups differed in their approach. Entrepreneurs stressed procedural solutions, such as limiting the possibilities to appeal, reducing the complexity of the formal authorisation trajectory and using a top down planning approach. Civil servants stressed more strategic solutions, such as providing more public information on the necessity of wind power for local politicians and citizens, and community involvement in planning processes.

Institutional and social conditions

The case studies on the entrepreneurial groups show that the shifts in importance between entrepreneurial groups, the differences in development paths and performances, have to do with differences in entrepreneurial characteristics and with changes in national and local social and institutional conditions.

With regard to institutional conditions, we analysed the constellation of rules structuring the interactive behaviour of actors and determining the opportunities and constraints for wind power. The formal institutional framework (formal rules, procedures and instruments) comprises (1) the rules that determine positions of actors on the electricity market or the market structure, (2) financial preconditions and (3) preconditions for implementation or planning and permitting procedures.

The major institutional changes in each of the three clusters have been:

1. A transition from a monopolistic market structure, in which strategic energy policies facilitated energy distributors, to a liberalised market structure, in which the bargaining powers of private producers increased.
2. A transition from a subsidy incentive system with a central role for energy distributors in financial support, to a fiscal incentive system, characterised by a very profitable investment climate just as accessible for private power producers as for energy distributors.
3. Though the authorisation trajectory is fragmented and complex of character, the planning and permitting procedures remained relatively stable throughout the years. The only important institutional change was the demand for clustering, which was comparatively speaking more of a disadvantage for small private investors and wind cooperatives than for energy distributors and new independent wind power producers.

With regard to social conditions, we analysed interactive nature of the preferences and behaviour of wind power entrepreneurs and other stakeholders involved in wind power implementation. The constellation of social conditions comprises (1) characteristics of the entrepreneurial groups, (2) the social constellation of stakeholders and their perceptions and (3) the interaction between wind power entrepreneurs and other stakeholders involved.

1. Entrepreneurial characteristics partly explain the differences in performance. The most important distinctive characteristics are the motivation to invest, the degree of professionalism, and the position of wind energy as investment option.
2. The social constellation of stakeholders with free access to the local decision making process brings about barriers in the local political process. A confrontation of ideas about

the necessity and (local) costs of wind power dominates the local political debate. This confrontation of ideas is slippery for entrepreneurs.

3. Interactions between wind power entrepreneurs and other stakeholders involved, both on the local and national level, determine their opportunities. Positive local capacities, such as a collaborative approach by local authorities, collaborative arrangements between local entrepreneurs and social coherence with regard to wind energy, are important social conditions for the implementation capacity.

Interdependencies between social and institutional conditions

The isolation of institutional and social conditions does not do justice to the empirical observations as described in each of the case studies. We continuously saw interplay between social and institutional conditions. Three important observations can be drawn from our study:

1. The mix of institutional conditions can either stimulate or constrain the implementation capacity. However, what would be a good mix of conditions relates to the characteristics of an entrepreneurial group.
2. Social conditions can weaken, strengthen, or neutralise negative or positive institutional conditions, and vice versa. An institutional condition or structure is not a bottleneck in itself. It is the way stakeholders deal with this institutional structure that clarifies implementation.
3. There is a continuous dynamic in social and institutional conditions at the local, provincial and national level. This dynamic for the larger part proofs to be an undirected process.

Governance of wind power

Looking at the development of social and institutional conditions and the role of governmental steering over the last 15 years, we notice that governmental policy making has always been based on a very specific interpretation of reality. The renewable energy policy theory mainly comprised (a) ideas about the market structure and the proper type of investor and (b) ideas about the proper type of financial incentive system. Clearly, the government did not go deeply into the question which type of entrepreneur could become a driving force in the market. This, however, was an important question to address, since the market did not comprise a homogeneous set of actors or entrepreneurs. For long renewable energy policy facilitated only one type of investor: the energy distributors. It would be the end of the 1990s before the bargaining power on the market became more balanced between different types of entrepreneurs. This change in power positions occurred due to the broader process of liberalisation, which was induced externally by European developments. The process of liberalisation and the subsequent changes in the wind power market were completely opposite to the original renewable energy policy theory.

Lessons for future wind power policy

Our *first recommendation* is to always take the heterogeneity of the market as the central point of departure in the renewable energy policy theory. Effective policy making on the implementation of wind power should start with identifying the potential of different market players and their characteristics and use this analysis to design strategies that accommodate the potentials of the most motivated groups.

Our *second recommendation* is to explicitly test the renewable energy policy theory with regard to gaps or tensions in steering at different levels of government. A specific institutional

instrument or a specific argumentation at the national level proofs to be useless if it contradicts local social conditions.

Our *third recommendation* is that at the national level a clearly communicated and broadly supported commitment to wind power implementation should be established. The renewable energy policy theory should be a co-product of different ministries and other government authorities, and a coherent view in line with this policy theory should be actively shown to the public, the market and to other authorities.

Our *fourth recommendation* is that the use of ex ante potential studies stressing economic and technical conditions should be supplemented with *social potential studies* in order to design 'smart policies'. Smart policies explicitly include ideas about social and institutional conditions on different levels of government.

Finally our *fifth recommendation* is to secure a stable investment climate for the target groups of wind power policy as identified by social potential studies.

Using the implementation capacity concept

For researching a complex and dynamic reality, the concept turned out to be useful. We adopted a mix of methods to establish the implementation capacity for different types of investors over the long term. This long-term perspective enabled us to analyse long-term dynamics in the market. We effectively showed that a continuous focus on implementation in its social and institutional context is essential for coping with the challenges for an accelerated implementation of renewable energy sources. We demonstrated that the changing mix of social and institutional conditions dictated the degree to which the wind power market emerged and especially the way it developed in terms of entrepreneurial groups. On the basis of these findings we recommend the use of our analytical perspective and the implementation capacity concept in a variety of social potential studies. The implementation capacity concept may be used for cross-national comparison between markets, and for analysing market developments of other renewable energy technologies. These social potential studies can serve to systematically typify important social and institutional conditions on different levels of government in order to design smart policies.

Such smart policies will be needed to achieve the substantial goal of a transition to a non fossil fuel based energy infrastructure, which is required for addressing the climate impacts of fossil fuel based economies and addressing the geo-political impacts of depleting resources. A social science perspective will be indispensable in this.

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In dit proefschrift heb ik gekozen voor een institutionele benadering voor de bestudering van de opkomst en prestaties van verschillende typen 'ondernemers in wind'. De focus van deze benadering betreft de wisselwerking tussen kwaliteiten, gedrag, voorkeuren en belangen van individuele actoren enerzijds, en de mogelijkheden en beperkingen zoals verankerd in de 'geïnstitutionaliseerde omgeving' waarbinnen deze actoren werkzaam zijn anderzijds. De benadering leent zich uitstekend voor een korte reflectie op het promotietraject. Wetenschap bedrijf je nu eenmaal niet in 'splendid isolation'. De kans op succes bij het schrijven van een proefschrift hangt af van kwaliteiten, het gedrag, de voorkeuren en belangen van een groot aantal individuen (de promovenda, begeleiders, respondenten, collega's, familie en vrienden) en van de mogelijkheden en beperkingen zoals verankerd in de omgeving (financiering, de beschikbaarheid van een werkplek en bijvoorbeeld de dienstregeling van de NS). Een groot aantal mensen in mijn omgeving (hun kwaliteiten, voorkeuren en gedrag) hebben impliciet of expliciet bijgedragen aan de totstandkoming van dit proefschrift. Deze mensen wil ik graag danken.

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