WHERE, WHO AND HOW MUCH?
WIND POWER DEPLOYMENT IN URBANISED REGIONS

AN INSTITUTIONAL ANALYSIS OF PLANNING AND IMPLEMENTATION

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TECHNISCHE UNIVERSITÄT WIEN

DISSERTATION

WHERE, WHO AND HOW MUCH?
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Deutsche Zusammenfassung der Dissertation

WO, WER UND WIE VIEL? WINDKRAFTAUSBAU IN VERSTÄDTERTEN REGIONEN. EINE INSTITUTIONELLE ANALYSE ÜBER PLANUNG UND IMPLEMENTATION.

Einleitung

2014 warnte der IPCC Weltklimarat vor erheblichen Auswirkungen auf Mensch und Umwelt durch die fortschreitende Emission von Treibhausgasen. Die Umsetzung von Klima- und Energiezielen schreitet nur langsam voran. Mit dem Pariser Klimaabkommen wurde dieses Problem ins Zentrum der Aufmerksamkeit gerückt, mit dem Hinweis, dass es eine „signifikante Kluft zwischen Zusicherungen und Ergebnissen“ (UNFCCC, 2015) gäbe. Dies wiederum führte zu lebhaften Auseinandersetzungen über die Raumplanung als „unterstützende“ oder „einschränkende“ Einflussgröße; viele Beobachter bezweifeln die Anpassungsfähigkeit von bestehenden Planungssystemen an die wachsenden Herausforderungen des Klimawandels und der Energiewende. Die Dringlichkeit, um Energieziele nicht nur zu beschließen, sondern auch zu *erreichen*, ist mittlerweile groß.

Relevanz der Forschungsarbeit

Zwischen Planung und Umsetzung von Klimazielen, wie etwa im Bereich der erneuerbaren Energie, gibt es also eine spürbare Spannung; und dies betrifft auch den Ausbau von Windenergie. Diese Doktorarbeit hat die Wirksamkeit von raumplanerischen Ansätzen zur Steuerung des Windkraftausbaues untersucht — in verstädterten Regionen Europas und von einer institutionellen Perspektive aus betrachtet.

Windenergie hat sich innerhalb von zwei Jahrzehnten von einer Nischentechnologie zu einem global erfolgreichen Industriezweig entwickelt. Für die Raumplanung ergeben sich aus dieser Entwicklung wichtige Erfahrungswerte im Umgang mit erneuerbarer Energie und über Herausforderungen des Klimawandels, die über technische Fragestellungen hinausgehen. Die Raumplanung stellt Rahmenbedingungen auf für eine demokratische Entscheidungsfindung in einem bestimmten Kontext und sorgt für Abstimmung zwischen Energiezielen und anderen thematischen Schwerpunkten. Planungsinstitutionen können Entscheidungen nicht vorschreiben, sondern höchstens „in die richtigen Wege leiten“. Dieses „Leiten“ setzt eine Strategie voraus, die über die Feststellung eines Energiezieles hinausgeht.

Forschungslayout

Das Forschungslayout wurde abgeleitet von akteursorientierten Methoden der Politikfeldanalyse und beruht auf der vergleichenden Analyse von Raumplanungspolitiken. Der Vergleich bezieht sich auf drei Regionen in drei unterschiedlichen Ländern. Die Komplexitäten und Widersprüche der Planungspraxis stellen die Hauptwissensquelle dar. Bei einer Forschungsmethode, die bei Fallstudien ansetzt, stehen kontextabhängige Ergebnisse im Fokus.

Die ausgewählten Analysegebiete waren Südholland (Niederlande), Niederösterreich (Österreich) und Ostflandern (Belgien). Es handelt sich um weitgehend verstädterte Regionen mit günstigen klimatischen Voraussetzungen für die Erzeugung von Windenergie. Jede Region hat Windkraftziele verabschiedet und Zonierungsgebiete in räumlichen Entwicklungskonzepten aufgenommen. Aufgrund der geografischen Ähnlichkeiten waren die ausgewählten Regionen mit vergleichbaren Problemen

konfrontiert, ihre raumplanerischen Lösungsansätze weichen aber erheblich voneinander ab.

Insgesamt wurden in den drei Fallstudienregionen 24 ExpertInneninterviews durchgeführt. Dies lieferte eine Vielfalt an Erkenntnissen aus verschiedenen Akteursperspektiven, die durch dokumentarische Quellen verifiziert wurden. Um die Übertragbarkeit der Ergebnisse aus dem Fallstudienvergleich zu überprüfen, wurde ein viertes Analysegebiet in Österreich ausgewählt. Dies ermöglichte einen Einblick, inwiefern die aus den Fallstudien gewonnenen Erkenntnisse verallgemeinert, beziehungsweise auf andere (verstädterte) Regionen übertragen werden könnten.

Konzeptioneller Rahmen

Die drei Beispielregionen mussten strukturiert untersucht werden. Die angewandte Methodologie basiert auf Analysekonzepte von Mayntz und Scharpf (1995) und Ostrom (2005). Diese wurden entwickelt, um die Frage zu beantworten, wie Institutionen „Handlungssituationen" strukturieren – also jene Situationen, in denen politische Entscheidungen getroffen werden. Unter Verwendung von Werkzeugen aus diesen Analyserahmen wurden die raumplanerischen Ansätze für Windenergie von Niederösterreich, Südholland und Ostflandern untersucht und miteinander verglichen.

Unter „Planungsansatz" wird eine bestimmte Herangehensweise verstanden, um mit einer Situation, oder einem Problem, umzugehen. Ein Planungsansatz für Windenergie hat sowohl eine räumliche, als eine zeitliche Komponente. Er beinhaltet strategische, räumliche Entscheidungen (Bereitstellung von Land) und prozessorientierte Regeln (thematische Schwerpunkte). Planungsansätze für Windenergie ergeben sich aus gesetzlichen, energie- und raumplanerischen Vorgaben auf verschiedenen Steuerungsebenen (z. B. national, regional und lokal), den jeweiligen *Arenen*, in denen Regeln festgelegt wurden (AkteurInnen und deren Interaktion) und der Art und Weise, wie diese Regeln (oder Vorgaben) umgesetzt werden (z. B. mit oder ohne öffentliche Konsultation).

Für diese Dissertation wurde außerdem ein konzeptionelle Rahmen entwickelt, um die vergleichende Analyse von Fallbespielen durchführen zu können. Dieser Rahmen unterscheidet zwischen vier, voneinander abhängigen, Dimensionen der Raumpolitikgestaltung und -umsetzung: „Konditionen“ beeinflussen die Strukturen von „Windenergieplanungsarenen“; Dies führt zu Akteursinteraktionen, die sowohl Raumplanungspolitiken hervorbringen, als deren Umsetzung: „Planungsansätze für Windenergie“ und „Implementierung“.

Darüber hinaus wurden Beurteilungskriterien entwickelt, um die jeweiligen Interaktionsformen in den untersuchten Planungsprozessen und die daraus entstehende, fortschreitende Implementation von Windenergie zu bewerten. Diese Kriterien begründen sich auf einige allgemeine, politische Zielsetzungen: rechtzeitige Umsetzung von Energiezielen, ressourcenbewusster Umgang mit Land und soziale Akzeptanz von Windenergie. Ein entscheidender Punkt war, welche spezifischen, raumplanerischen Regeln aus den Fallbespielen wesentlich zur Umsetzung dieser Ziele beigetragen haben; und ob diese Regeln in einem allgemeineren Sinne gültig wären.

Schlussfolgerungen

Planungsträger sollten die Pfadabhängigkeit bei räumlichen Entscheidungen stärker berücksichtigen. In den drei Fallstudien haben die gewählten Planungsansätze den Windkraftausbau eher eingeschränkt als gefördert, vor allem wenn es notwendig wurde, um nach „alternativen Standorten“ zu suchen. Planungsentscheidungen sollten in eine langfristige (post-2020) Strategie eingebettet werden, die die graduelle Anpassung von Landnutzungsentscheidungen berücksichtigt.

Die Ergebnisse unterstreichen die Bedeutung eines partizipativen Verfahrens, genauer gesagt geht es um die Miteinbeziehung von direkt betroffenen AkteurInnen. Diese wäre dringend erforderlich, um auf mögliche Interessenskonflikte auf lokaler Ebene frühzeitig reagieren zu können. Lokale Faktoren können erneuerbare Energieentwicklungen wesentlich vorantreiben, aber auch behindern. Die Planungsansätze in den Fallstudien haben vielfach den Bedenken höherer Regierungsebenen nachgegeben. Energieziele hatten Priorität, d.h. vor lokalen, kontextbezogenen Interessen. In der Folge stieß man in den ausgewählten Windkraftzonen auf lokaler Ebene nur begrenzt auf Zustimmung.

Tatsächlich wird die Basis für „lokal unterstützte“ Windkraftzonen im Entscheidungsprozess geschaffen. Hier können Planungspraktiken institutionalisiert werden, die förderlich sind für die gegenseitige Abstimmung von kollektiven Zielsetzungen (von höheren Regierungsebenen) und den wechselnden, lokalspezifischen Werten. Das Instrument der Zonierung ist dabei ein mächtiges Werkzeug, welches nicht nur die räumlich-territoriale Verteilung von Windkraftanlagen vorschreibt, sondern sozio-organisatorische Einheiten konfiguriert, wo u. a. Windkraftentwickler, BewohnerInnen, lokale Behörden und regionale Planungsträger aufeinandertreffen. Die Einführung von Windkraftzonen kann daher den Spielraum für zukünftige (Um)planungen stark einschränken. Der Grund ist, dass Zonierungsentscheidungen mehr als eine Gebietsbezeichnung darstellen; es wird ein sozialer Konsens über Landnutzungsentscheidungen vermittelt und eine öffentliche Erwartungshaltung institutionalisiert „wo Windkraft kommt“ und „wo nicht“.

English abstract of thesis

WHERE, WHO AND HOW MUCH? WIND POWER DEPLOYMENT IN URBANISED REGIONS. AN INSTITUTIONAL ANALYSIS OF PLANNING AND IMPLEMENTATION.

Introduction

In 2014, the Intergovernmental Panel on Climate Change warned that continued emission of greenhouse gases would have severe impacts on people and ecosystems. However, the implementation of climate policies is being delayed. The Paris Climate Agreement spoke about a 'significant gap between pledges and results' (UNFCCC, 2015). This has led to lively discussions on the legitimate role of spatial planning as either a supportive or a restrictive influencing variable; and many observers have also wondered whether planning systems are sufficiently adaptable to fulfil the increasingly technological demands of climate change and the energy transition. It has become urgent not only to decide on climate and energy targets, but to actually reach them.

Relevance of research

There is a palpable tension between the planning and implementation of climate targets, for instance as regards renewable energy resources — among which wind power plays a significant role. This thesis deals with this tension by analysing the effectiveness of spatial planning approaches to the deployment of wind energy in a number of European urbanised regions.

In the space of only two decades, wind energy has developed from a niche technology to a globally successful industry. Experience drawn from wind energy planning practice is thus an important source of knowledge to understand the social, political, and institutional challenges presented by climate change beyond its technical dimensions.

In this context, spatial planning provides a democratic decision-making framework that facilitates the formulation of goals within specific environments. Thus planning institutions cannot prescribe any specific development but, rather, they can propose directions. This guidance requires a strategy that goes beyond the mere formulation of an energy target.

Research design

The research design derives from actor-centred methods of policy analysis. The analysis deals with three comparable case studies grounded in three different countries. The complexity and contradictions of real life were the main source of learning. The underlying notion was that context-dependent knowledge and expertise lay at the centre of the case study as a research method.

The analysed urbanised regions were South Holland (Netherlands), Lower Austria (Austria) and East Flanders (Belgium). All three regions are characterized by a high degree of urbanisation and a climate that favours the generation of wind power. Each region adopted wind energy targets and introduced zoned areas in its regional planning agenda. Although the selected regions faced similar problems and found themselves in comparable situations, their spatial planning approaches diverged significantly.

A total of twenty-four expert interviews was conducted in the three case study regions. This provided a great deal of actor-based evidence, which was complemented by

documentary sources. To test the transferability of results, a fourth region of analysis, located in Austria, was added. This made it possible to investigate how far evidence derived from the case studies could be generalized or applied to other urbanised regions.

Conceptual framework

It was essential to investigate the three regions in a structured way. For this reason, this thesis is based on the policy analysis frameworks of Mayntz and Scharpf (1995) and Ostrom (2005), which were developed to guide researchers dealing with the question of how institutions structure 'action situations', i.e. the 'black box' within which policy choices are made. Making use of the tools of institutional analysis, the case studies explore the planning approaches to wind energy that were used in three regions: Lower Austria, South Holland, and East Flanders. By 'planning approach', we refer to a way of dealing with a situation or problem by engaging in spatial planning. A planning approach to wind energy thus consists in governing wind power deployment across space and time. It implies a spatial exercise (formulating land-use plans) combined with a procedural method (way of dealing with an issue).

This goes beyond the narrow confines of wind energy policy, being composed of formalized energy and spatial policy rules at critical governance levels (e.g. national, regional, and local), along with the arenas within which these rules are decided (types of actors involved and types of interaction between them), and the ways in which these rules are subsequently implemented (for instance, with or without public consultation).

The conceptual framework applied to the three case studies differentiates between four interdependent dimensions of wind energy policy-making and implementation: *´conditions´* affect the structure of *´wind energy planning arenas´*; this leads to interactions that produce policies: *´planning approaches to wind energy´*, and outcomes: *´wind energy implementation´*.

Furthermore, evaluative criteria were used to examine the patterns of interactions and observed outcomes. These were: timely implementation of energy targets, resource-aware treatment of land, and local acceptance of wind energy. A crucial point of the evaluation was whether case-specific spatial rules helped to produce incentives leading to desired policy outcomes and whether these rules were valid in a more general sense.

Conclusions

Planning agents need to be more aware of path dependency in spatial decisions concerning renewable energy. One of the wider implications of the planning approaches in the three case studies was that they restricted, rather than promoted development when it came to searching for ´alternative locations´. In the light of post-2020 renewable energy growth, this would call for a more long-term perspective in spatial planning that incorporates gradual adaptation strategies.

Furthermore, the findings underline the importance of a participative procedure within the planning process. This is needed to respond to political, economic, and social challenges at the local level that drive (or hinder) renewable energy development. The planning approaches that were observed within the framework of the case studies often yielded to the concerns of higher governance levels, clearly prioritising energy goals

above local, contextual values. In consequence, ‘zones for wind energy’ were not always accepted at the local level.

Indeed the foundation for locally supported wind energy zones is laid down in the planning process itself. This process can provide the framework needed to institutionalise a trade-off between collective purposes at a higher governance level and locally changing contexts and values.

The introduction of zoned areas is thus a strong measure that not only determines the territorial spread of wind turbines, but also configures socio-organisational entities made up of implementation actors (developers, local residents, and authorities).

The case study findings show that, when zoned areas had to be re-defined, local opposition or ‘unwillingness’ seriously restricted the amount of leeway needed to reach consensus about alternative locations. The reason was that the formal planning exercise (zoning wind energy) implied more than a territorial designation: it communicated social consensus on land-use decisions and institutionalised public expectations of ´where wind turbines would come´ and ´where they would not´.

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TABLE OF CONTENTS

TABLE OF FIGURES

Abbreviations and terminology

Abbreviations (organisations)

BirdLife	Partnership of conservation organisations for birds and their habitats
CBS	Statistics Netherlands
CONCERE-EROVER	Belgium Federal-Regional Energy Consultation Group
ECTP-CEU	European Council of Spatial Planners
EVN	Lower Austrian utility company
EWEA	European Wind Energy Association
IEA	International Energy Agency
IEA Wind	International Energy Agency Wind Technology Collaboration Programme
IG Windkraft	Austrian Wind Energy Association
IPCC	Intergovernmental Panel on Climate Change
IPO	Netherlands Interprovincial Association
IWWG	Flemish interdepartmental task group for wind
LNE	Flemish department for environment, nature and energy
NLVOW	Netherlands community organisation against wind energy
NÖ	State of Lower Austria
NWEA	Netherlands Wind Energy Association
ODE	Flemish organisation for sustainable energy
OECD	Organisation for Economic Co-operation and Development
OeMAG	Austrian administration centre for eco-electricity
ÖROK	Austrian Conference on Spatial Planning
PBL	Netherlands Environmental Assessment Agency
POM	Provincial economic development agency of East Flanders
PROCORO	Provincial advisory board for spatial planning of East Flanders
RESCOOP	Flemish association for renewable energy cooperatives
RVO	Netherlands Enterprise Agency
RWO	Flemish department for spatial planning
UNFCCC	United Nations Framework Convention on Climate Change
VEA	Flemish Energy Agency
VNG	Netherlands Association of Municipalities
VWEA	Flemish Wind Energy Association

Abbreviations (energy)

CO2e	Carbon dioxide equivalent (a measure used to compare the emissions from various greenhouse gases based upon their global warming potential)
Mtoe	Million tonnes of oil equivalent (a unit of energy equivalent to the approximate amount of energy that can be extracted from one Million tonnes of crude oil)
MW	megawatt (a unit of power equal to one million watts)
MWh	megawatt-hour (a unit of energy equal to the work done by a power of a million watts in one hour)

Abbreviations (other)

ACI	Actor-Centred Institutionalism
E40 area	Wind energy implementation area ´E40-Aalter-Aalst´ in East Flanders
EIA	Environmental Impact Assessment

FIT	Feed-in tariff
GEA	Austrian Green Energy Act
GRUP	Regional implementation plan in Flanders
IAD	Institutional Analysis and Development Framework
LOI	Letter of intent
ME area	Wind energy implementation area ´Maldegem-Eeklo´ in East Flanders
NGO	Non-governmental organisation
Nö ROG	Lower Austrian Spatial Planning Act
ÖREK	Austrian Spatial Development Scheme
PRS	Provincial Structure Plan of East Flanders
PRUP	Provincial implementation plan (East Flanders)
RSV	Flemish Spatial Structure Plan
SDE / SDE+	Dutch national incentive programme for sustainable energy
SEA	Strategic Environmental Assessment
Sek ROP	Lower Austrian sectoral spatial planning ordinance
SVIR	Dutch National Structure Plan for Infrastructure and Spatial Planning
SvWOL	Dutch National Plan for Onshore Wind Energy
VCRO	Flemish Spatial Planning Act
ViA	Flemish energy vision
VLAREM	Flemish decree on environmental licensing
VRM	South Holland Spatial Structure Plan
WT	Wind turbines

Terminology

Clichering	Flemish spatial planning rule that allows the combination of wind energy with agriculture.
Dispersed clustering	Guiding principle of the Flemish Spatial Structure Plan. Urban or industrial development is to be bundled with the ´cores´ of rural areas and the fringes of towns.
Distance regulation	A spatial planning regulation that sets minimum distances between wind energy generators and specific (vulnerable) land-use categories.
Green Heart	Famous Dutch planning concept that refers to a green and open central area surrounded by a ring of Dutch cities, the *Randstad*.
Microregional schemes	Sporadic spatial planning efforts to zone wind power in selected parts of Lower Austria
Randstad	A conurbation in the north-western Netherlands that stretches in a horseshoe shape from Dordrecht to Amersfoort and includes the four largest cities: Rotterdam, The Hague, Amsterdam and Utrecht.
Unbundling procedure	A method to generate wind energy zones by pooling knowledge about conflicting land uses, supported by GIS methods for combining data with geographical references.
Wind farm / wind park	A clustered development of several wind turbines in the same location.
Wind letter	A periodic memorandum by the Flemish government that summarizes the spatial planning requirements for the approval of wind energy projects.
Zone / zoned area	Area indicated on a map where a specific land use — e.g. generation of wind energy — is allowed or excluded.

It is not down in any map; true places never are.
(Herman Melville, 1851)

> Renewables will move to the centre of the energy mix in Europe, from technology development to mass production and deployment, from small scale to larger scale, integrating local and more remote sources, from subsidised to competitive. (European Commission, 2012, p.10)

1 Introduction

In 2014, the Intergovernmental Panel on Climate Change (IPCC) warned that continued emission of greenhouse gases would have severe impacts on people and ecosystems. However, the implementation of climate policies is being delayed. Despite the growing number of policies to mitigate climate change, global emissions have been rising to ´unprecedented levels´ (IPCC, 2014). In reaction to this worrying trend, at the Paris climate conference in December 2015, some 195 countries set up a global action plan to put the world on track and avoid dangerous climate change. The Paris Climate Agreement spoke about the 'significant gap´ between the effect of countries' mitigation pledges and the pathways required to reduce greenhouse gases (UNFCCC, 2015). It adopted a legally binding global climate deal: to keep a global temperature rise well below two degrees Celsius. Hence it has become urgent not only to decide on climate and energy targets, but to actually *reach* them.

Parties that signed the Paris Agreement are to mitigate greenhouse gas emissions by promoting sustainable development; decarbonizing the electricity supply is among the most important measures. This involves the phasing out of fossil fuel power generation by 2100 and its replacement by renewable and other low-carbon energy sources (IPCC, 2014). Thus, from the perspective of the IPCC and Paris Agreement, renewable energy is considered a suitable and very promising alternative to fossil energy. This description of the potential contribution of renewable energy has been repeated in climate and energy reports, as well as in policies all over the world. It is expressed in standard unit sizes such as ´CO2e´[1] or ´Mtoe´,[2] which highlight the political goal: to overcome reliance on fossil fuels with regard to greenhouse gas emissions.

The dominant paradigm in international energy and climate policy is thus to theorise and generalise different forms of energy generation to be able to assess collective energy developments and define goals from an international perspective, and communicate about them. However, as Shove (2017) critically

1 Carbon dioxide equivalent. A measure used to compare the emissions from various greenhouse gases based upon their global warming potential (OECD, 2018).
2 Million tonnes of oil equivalent. By convention it is equivalent to the approximate amount of energy that can be extracted from one million tonne of crude oil (Eurostat, 2018).

commented in her ground-breaking article on energy and social practice, this way of thinking runs the risk of stripping energy of the specific setting in which it is produced and used:

> Despite this description, renewables are not 'oil equivalent': they are not depleted or stored in the same way, the scale of the 'resource' cannot be estimated in the same terms, and there are distinctive and important variations in the timing and location of harvesting or 'production'. Since there are significant losses involved in converting renewable energy into forms that can be transported over any distance, or stored on any scale there is a distinctive immediacy to the relation between supply and demand. (Shove, 2017, p. 4)

According to Shove, approaching the contribution of renewable energy as ´oil equivalent´ could potentially disturb the entire fight against climate change. This is confirmed by Breukers and Wolsink (2007, p. 2748), who argued that, in the case of wind energy, renewable energy could become ´a victim of its own success´, for instance if there is no suitable, context-related approach to its implementation.

Shove therefore proposes to use a less abstract definition of ´energy´ in policy agendas by re-conceptualising the relation between energy and social practice. Such a strategy would recognise that many different policy-making areas have a hand in shaping energy roadmaps, and in imagining orders and practices that would be more compatible with greater reliance on renewables. This, however, demands a closer examination of various (social and environmental) contextual factors of renewables, such as solar and wind power, and this from a more comprehensive perspective. Moreover, as energy policy has a strong international dimension, it also raises the following question: how might these factors be represented at an international level and at different levels of implementation pursuing the collective effort of climate mitigation?

These two dilemmas faced by policy-making in the field of renewable energy — (1) the establishment of standardized metrics and the outlining of climate and energy targets at a governance level far from the implementation settings, and (2) the translation of these targets into place and resource-dependent practices — are the central topics of this PhD thesis. The discussion about the abstract nature of energy targets both in international and national policies indicates the necessity for a comprehensive, analytical approach that focuses on the different institutional settings in which these targets are implemented. Therefore the focus of analysis is on comparing planning practice within the regulatory frameworks of different planning systems, i.e. the contextual ´planning episodes´ (Healey, 2004; 2006) of European urbanised regions. The international perspective provides a level of comparison that matches the (equally international) scale of the energy transition.

Renewable energy and spatial planning

In a recent publication by the European Council of Spatial Planners (ECTP-CEU, 2016), delivering sustainable energy solutions was defined as a fundamental task

of spatial planning. In other words, organising the way in which a higher share of renewables can be manifested in space is considered a spatial planning exercise. Planners and planning systems can co-ordinate public action in the physical environment to mitigate the effects of climate change, to ´*safeguard the future of the planet and ensure [...] the well-being of the entire population*´ (ECTP-CEU, 2015, p. 3).

This somewhat one-sided view of spatial planning as an instrument ´to pass on´ the goals of higher governance levels to local implementation levels is, however, not shared by analysts of government practices in the field of wind energy. They have largely questioned the justification of spatial planning as a supportive influencing variable whose role is to meet energy stipulations decided at higher governance levels (Ellis et al., 2009; Cowell, 2010; Szarka et al., 2012). Besides, it has become apparent that the renewal of the energy system increasingly dominates current spatial planning policy agendas in many European countries (Reimer, Getimis and Blotevogel, 2014). These agendas tend to prioritise the ´common good´ over and above local concerns; they fail to produce adequate answers to local decision-makers about development and land use, with which the goals of higher governance levels are often irreconcilable (Wolsink, 2007).

Institutional challenges in spatial planning are particularly related to the flexibility and adaptability of its practices, which are needed to supply ´acceptable locations´ (Cowell, 2010) for renewable energy generation. Here, it is possible to detect similar trends at a European level: targeted emission or energy values are combined with administratively defined spaces, e.g. by putting the zoning of renewable energy generation on regional spatial planning agendas. While renewable energy was formerly a local planning matter, responsibilities have increasingly shifted to higher governance levels. This is in response to a growing awareness that renewables need to be ´tamed´ because they are more land-intensive, more ´visible´ in the landscape, and more decentralised in terms of territorial spread of installations than traditional (carbon-intensive) forms of energy production and distribution (PBL, 2014).

These adjustments of planning practice express a recognised dilemma in the intermediate space between energy and spatial planning policies: seeking to contextualise abstract energy futures within a concrete, land-based strategy (Cowell, 2010). They call for comprehensive conceptions that would acknowledge the influence of policy framing (the narrative on which the exercise of power is based) as well as the structuring forces of ´formal and informal institutions´ (Reimer, Getimis and Blotevogel, 2014). This then touches upon the second objective of this thesis, which is to find adequate explanations for the effectiveness (or lack of it) of contextual policies and practices, and whether these experiences are valid in a more general sense.

Object and scope of thesis

This PhD thesis enters the field of tension between international energy targets and the variety of planning practices by analysing the effectiveness of spatial approaches to onshore wind energy in European urbanised regions. Planning practices and systems are examined from an institutional perspective, i.e. dealing with how actors operate within a perceived environment (Evers, 2004, p. 22). The main assumption is that wind power deployment, like any other spatial development, involves an array of activities such as analysing economic profitability, securing land, providing financing, and obtaining planning permits. Each activity involves interaction between different actors, such as private developers, communities, or governmental agencies.

The starting point is that the wind energy sector contributes essential practical experience to understanding the social, political, and institutional challenges presented by ´the conceptualization of energy as a singular resource´ (Shove, 2017) in regional energy and climate agendas. Indeed within two decades, wind energy has developed from a niche technology to a globally successful industry (EWEA 2014). In terms of spatial planning, wind energy has become a comprehensive testing laboratory for the strategic, large-scale implementation of renewable energy through a democratic process and in specific environments.

The applicability of experiences from wind energy to other renewable energy technologies has been discussed (Szarka et al., 2012). This work argues that organisational aspects are the most important as regards the dispersion of renewable energy, and less so the technology itself. In this regard, planning for renewable energy is more than the territorial assignment of (potential) sites for the purpose of power generation. Rather, it is a process-oriented task of achieving energy (and other) targets by coordinating the single actions taken by various actors in a specific environment over an extended period of time. Planning institutions cannot prescribe actions promoting renewable energy but, rather, they can propose directions.

This guidance requires a strategy that goes beyond the formulation of an energy target or *Leitbild*; it must sufficiently expand governance capacity as well. The aim of this thesis is therefore to explore the governance capacity of planning institutions, together with their related decisional structures, when it comes to the implementation of wind energy targets.

To this end, the research design for this thesis was derived from actor-oriented methods of policy analysis; it is based on the intensive, comparative analysis of recent practice examples in three different countries. The focus is on regional planning. Hence the analysed practice examples centre on regional planning approaches to wind energy in Austria, the Netherlands, and Belgium. The findings of the thesis lead to recommendations to policy-makers regarding the structures,

processes, and instruments of wind energy implementation — with wider implications for other renewable energies.

Following this first part of the introductory chapter, the design and scope of the research will be defined. Firstly, the object of study (wind power) will be presented in greater detail (Section 1.1). After that, I will turn to the relevance of the research (Section 1.3) and the underlying theory and conceptual framework (Section 1.4). The chapter will conclude by presenting the research question, methods applied to generate knowledge, and the content structure of the work.

1.1 Onshore wind power — a spatial planning issue

Policy targets for wind energy usually make use of physical units that describe the capacity, or energy production, of installed wind turbines in a defined environment, e.g. a desired amount of megawatts (MW) or megawatt-hours (MWh). Energy or capacity targets therefore cannot necessarily be equated with a specific number of turbines; they can equally be achieved through a higher utilisation of wind. For the productivity of a wind turbine is determined by several technical and environmental factors: natural wind conditions, the type and efficiency of turbine technology, or the layout of a wind park.[3] Besides the technical dimension, there is also a social dimension that affects productivity: the organisational structures that finance, distribute, and store wind energy to supply the consumer with renewable energy in an efficient manner.

Besides these socio-technological considerations, the implementation of energy targets is largely dependent on location requirements for wind turbines. These depend on a range of contextual considerations that will be discussed in greater detail in this section, such as: laws, societal norms, and planning practices that deeply influence the land-use debate around wind energy. These factors can be subsumed under three broad categories: economic, territorial, and social.

Economic concerns: land as a device for harvesting wind

Wind energy is ´harvested´ by wind turbines, a device that converts the wind's kinetic energy into electrical energy. Although turbine systems are manufactured in a range of vertical and horizontal axis types, current turbine types are mostly uniform, large-scale industrial structures. The dominance of one specific turbine type (the vertical axis type) has economic reasons: apart from favourable wind speeds, important factors boosting productivity are longer blades and taller towers. While in 1985 wind turbines had a capacity under 1 MW, with rotor diameters of around 15 metres, the average capacity of onshore turbines manufactured today is around 2.5-3 MW, with blades about 50 metres long

3 Also called ´wind farm´. Both terms describe a clustered development of several wind turbines in the same location.

(EWEA, 2017). The lifespan of a wind turbine is 20-25 years, long-term wind energy growth therefore goes hand in hand with regular replacement (repowering) of outdated generators.

Hence, economic considerations concerning the siting of a turbine rest on an optimal utilisation of the plant. Financial profit largely depends on the energy yield. Wind energy developers use location-specific climate data (e.g. wind speeds) to assess potential sites. This type of information is based on a technical rationale and largely ignores territorial and sociocultural factors. Other economic factors that may influence the wind energy sector are more process-oriented and include, for instance, the business model for financing the investment (e.g. commercial or cooperative), the safeguarding of land for potential development, investment in communication procedures, and compensation payments.

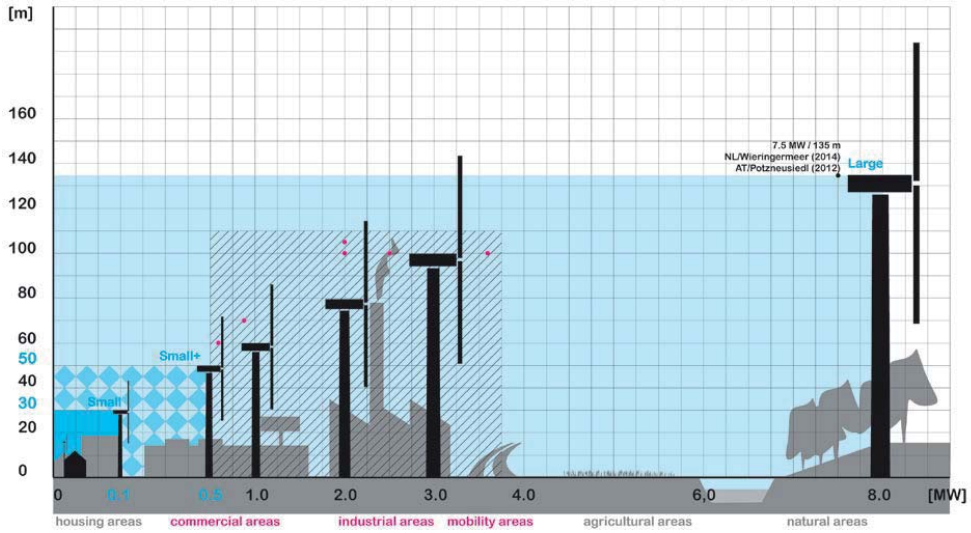


Figure 1. Wind turbines and land-use — possible functional intermixtures?
Figure by the author

Territorial concerns: administrative and biophysical factors

The most basic territorial consideration regarding wind energy concerns biophysical factors that drive or hinder development, e.g. climate and geographical conditions, the ease of access to a site to construct and maintain wind turbines, and the presence of physical obstacles, such as buildings or infrastructure.

Furthermore, the structuring forces of rules and regulations in legislative frameworks govern the allocation of wind turbines. This procedural rationale is greatly dependent on formal rules presiding over the licensing of wind turbines.

These define, for instance, which tier of government has the power to approve licences and which instruments may be applied to facilitate wind energy growth. The sets of rules that establish democratic decision-making in connection with land use are also bound to various governance levels: e.g. municipality, region, state, federal government, European Union. They are related to European environmental legislation, national or state legislation concerning electricity, spatial planning, building, traffic, harmful emissions, and the landscape. In addition, territorial considerations are deeply rooted in the established routines of planning practice.

Figure 2. Wind turbine setup in different environments — is there a choreography in siting turbines?
Figure by the author
Sources images: Austrian Wind Energy Association, 2014; Environmental Data Compendium, 2014

Social concerns: landscape, nature, and support by local population

Social concerns relate to deeply embedded societal norms as well as community attributes, such as regional cohesion in planning.[4] Public opinion regarding wind energy is reflected in the actions taken by government and policy-makers. This general attitude largely determines the extent to which a government promotes wind energy. On the other hand, at the level of local communities, individuals can influence wind energy by taking action for or against development.

Social considerations are also shaped by legal requirements that institutionalise social consensus, for instance those concerning land-use decisions. They relate to the conditions under which wind energy deployment is considered acceptable or unacceptable from a societal point of view. They are made up of social values and norms that can vary greatly across time and place, and can largely be reduced to considerations of quality of life (Pasqualetti 2012, p.146). Since wind turbines are large-scale structures, they have considerable impacts on their environment and are visible from great distances.

In this context, social considerations do not only relate to health and safety issues (icefall, shadow flicker, noise emission), but also to changes in the use and perception of landscapes, e.g. landscapes that are used for farming, recreation, or solitude. A common way for rules and regulations to address social considerations is to define land-use constraints and combinations that communicate qualitative, spatial standards. Other possibilities are procedural requirements, e.g. standards for local participation or compensation.

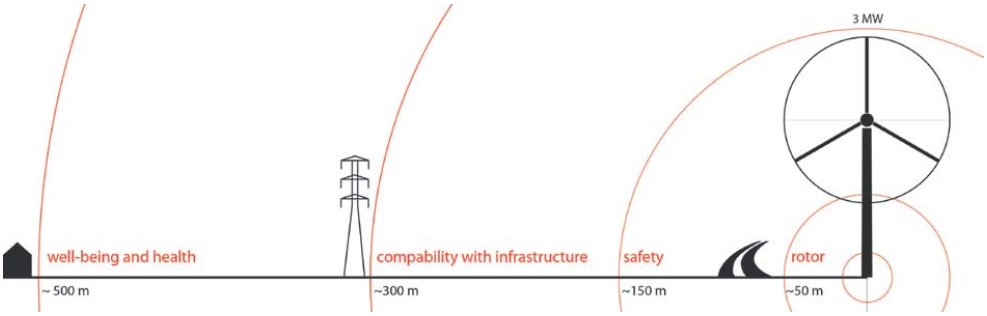


Figure 3. Distance regulations vary in each region — different levels of acceptance of health and safety risks?
Figure by the author

4 The term is not referring to European Union policy but to an established form of cooperation between various local communities that form a single unit in spatial planning.

Synthesis: dimensions of planning approaches

Summarizing the sections above, the basic assumption underlying this thesis is that wind power as an object of study requires a comprehensive, analytical approach that addresses its diverse — economic, territorial and social — dimensions. Often, these are not compatible with each other: in contrast to the resource ´wind´, ´land´ does not exist in infinite quantities. While from an economic perspective, wind should be used as profitably as possible, territorial considerations seek to allow the pursuit of other sectoral goals through statutory provisions that settle or avoid land-use conflicts. However, at a higher governance level, territorial requirements may well emphasise goals and generic rules that are not recognised at the local implementation level. Moreover, the social acceptance of wind energy depends on the norms and values that a particular location carries: aspects of well-being as well as landscape aesthetics and environmental values.

Figure 4 below summarizes the interplay between the different dimensions taken into consideration in spatial planning concerning wind energy. At the intersections of these dimensions, possible approaches emerge that prioritise different goals in wind energy planning. These are described in the following sections.

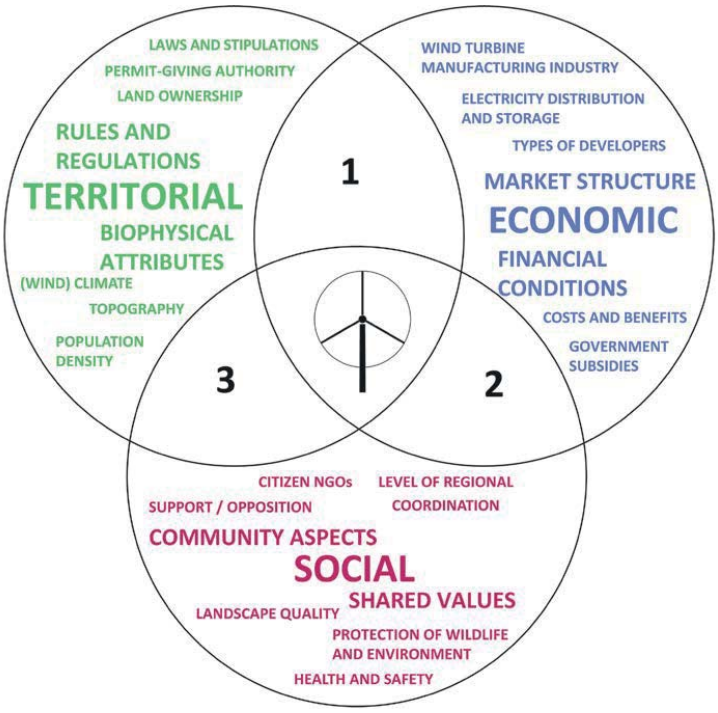


Figure 4. Dimensions in spatial planning and potential approaches to wind energy
Source: Figure by the author

A first approach to planning (1) focuses on economic and territorial requirements. Planning choices concerning wind energy result from the technical assessment of energy potential, as well as formal, territorial rules and regulations. This approach starts from the delivery of predefined, quantitative standards (Nadaï, 2012; Power and Cowell, 2012), e.g. an optimum installed capacity (MW) that can be implemented according to technological potential and normative land use regulations. The approach to planning is data-driven and maps out locations for wind power by using geographical information system (GIS) technology.

A second possible approach (2) is largely related to a mix of societal and economic considerations. To begin with, it builds support for wind power by institutionalising collective forms of development that facilitate local ownership (e.g. a cooperative business model) (Breukers and Wolsink, 2007; Strachan and Jones 2012). It focuses on bottom-up initiatives and enabling community benefits through project planning. This approach is applied for project-level developments rather than all-encompassing plans.

A third approach (3) explores the extent to which wind power can become a part of new landscapes (Nadaï, 2012; Sijmons, 2014). It is based on planning as a design discipline and frames policy goals according to landscape values. Rather than acting according to generic rules, this approach strongly incorporates site-specific sociocultural values connected with landscape and wildlife, and involves design strategies rather than normative procedures (Nadaï 2012) to explore possible development scenarios.

These three planning approaches (1, 2, and 3) are, of course, entirely hypothetical but they exemplify the fact that planning institutions can take various directions in the governance of wind energy. In practice, all three dimensions, economic, territorial, and social, influence planning choices. In the next section, on the basis of these insights we will develop a more detailed understanding of planning approaches to wind energy.

1.2 Understanding planning approaches to wind power

Following up on the possible directions in planning presented above, let us now work towards a definition of the object of analysis: the 'planning approach to wind energy'. This will lead to the development of an analytical framework that will assist with the comparative analysis of the case studies.

In the Oxford English Dictionary (2017), ´planning´ refers to the ´*process of making plans*´ and ´approach´ to ´*a way of dealing with a situation or problem*´. From a spatial planning perspective, the term therefore implies a spatial exercise (formulating land-use plans) combined with a procedural method (way of dealing with an issue). If we relate this definition to the ´planning problem of wind energy´ (Ellis et al., 2009), a planning approach to wind energy can be conceptualised as:

A strategy to govern wind energy deployment across space and time.

According to this understanding, an approach to wind energy consists of more than the mere allocation of wind turbines, e.g. by earmarking land for this purpose. Downstream, it also prescribes implementation guidelines for a defined development (wind park) within a specific area and time period.

Upstream, planning approaches are embedded in an institutional environment, the planning *system* of a country. Reimer, Getimis and Blotevogel (2014) provide an elaborate definition of planning systems in the European context: these determine laws, stipulations, and established practices on which spatial decisions are based. Thus they do not dictate planning approaches but rather channel choices in a certain direction:

> We interpret planning systems as ´dynamic institutional technologies which prescribe (…) structures for spatial order (…) within a specific defined area and (…) at various different tiers, i.e. national, regional and local. Accordingly, they define corridors of action for planning practice (…)´. (p. 14)

According to this statement, another important aspect is the handling of decision-making power at various tiers of government. Analysts who studied government practices concerning wind energy implementation in the UK, such as Power and Cowell (2012), conceptualised 'a planning approach to wind energy' as:

> (…) intuitively simple (…) often centered on the construction of maps, which assess an area´s potential for wind energy against an array of environmental, social and resource criteria, and uses this to guide future actions. (…) On closer inspection, however, it becomes clear that it can be implicated in very different 'modes of governing'. (p. 63)

According to Power and Cowell, these modes of governing can vary: they may be top-down or bottom-up, or a combination of these. Higher tiers of government may intervene in how the lower tiers make plans. Similarly, lower tiers of government can exert influence on plans at higher governmental levels. The objectives vary depending on the governance level one looks at and the contextual factors that are considered important. In this understanding, planning approaches can be composed of policies decided at different tiers, e.g. national strategies, regional plans, or local development schemes.

In order to provide a ´multi-scalar analytical framework´ (Reimer, Getimis and Blotevogel, 2014, p. 16), we therefore have to capture the main levels of planning. Regarding wind power, there are three spatial-organisational levels: the (1) institutional ´macro´ level coordinates the implementation of national and international agreements; the (2) ´meso´ level of regional planning operates between higher-tier stipulations and the (3) ´micro´ level of context-specific local implementation.

1.3 Relevance of research

The past ten years have seen growing academic interest in wind energy deployment. It is therefore important to position this research work in relation to existing literature. The following sections will give a brief overview of consulted academic literature to help determine the contribution of this thesis to existing knowledge. The overview is structured according to three literature fields: economics, social science, and spatial planning.

Concerning the economics of wind energy, the spatial and geographical conditions for the construction, operation and maintenance of wind farms are described in standard works (Gasch and Twele, 2013; Kaltschmitt and Streicher, 2009). This type of specialist literature deals with detailed, project-related planning issues, and its focus lies on technological challenges. A more finance-oriented literature addresses the design of European subsidy systems and their impacts (De Jager et al., 2011; Held et al.; 2014). Also, researchers have studied the interplay of governmental subsidies and spatial practice (e.g. Ohl and Eichhorn, 2010). Other, more planning-oriented academic research explores the methods that are used in planning practice to assess the potential of specific areas for renewable energy (Śliż-Szkliniarz, 2013).

More society-related knowledge is provided by scientific articles and book chapters dealing with the social acceptance of high-governance level schemes to increase the share of renewable energy. This type of research focuses on the local levels of implementation and identifies different categories of social acceptance related to renewable energy, in particular to wind energy. Wüstenhagen, Wolsink, and Bürer (2007) introduced socio-political, community, and market acceptance as the main categories. Breukers and Wolsink (2007) presented common problems in local social acceptance from an international, institutional perspective and highlighted the importance of local participation. Pasqualetti (2012) defined the nature of the main objections by local residents. Szarka et al. (eds., 2012) reflected on the learning process arising from wind energy expansion, as well as its political, institutional, and social factors from a global perspective.

The last body of knowledge deals with the evaluation of current spatial practice and research by design.[5] Several researchers have explored the interplay between technical assessment and zoning choices. Cowell (2010), Nadaï (2012), and Power and Cowell (2012) have studied the creation and wider implications of zoned areas for wind energy in several regions in the UK and France. In addition, analysts explored the impacts of the energy transition on landscape and strategic ideas about implementing renewable energy in a sustainable way; for instance, by building a landscape narrative for the energy transition (Van Kann and De Roo,

5 'Research by design' is any kind of inquiry in which design is a substantial part of the research process.

2011; Stremke et al., 2012; Stremke and van den Dobbelsteen, eds., 2012; Sijmons et al., 2014) they have presented conceptual approaches to design and planning dealing with ´energy landscapes´.

Following this short review, we can sketch the expected contribution of this piece of research to knowledge. So far, a negligible amount of research in the field of spatial planning has evaluated the interplay between energy goals and planning practice from an institutional perspective. Also, little is known about the nature of wind energy policies in European urbanised regions. Likewise, more knowledge is needed on the effectiveness of planning practices concerning post-2020 renewable energy scenarios.

Since we approach the end of the second decade of this millennium, and thereby the deadline of the European 2020 climate and energy package,[6] a comprehensive analysis of the effectiveness of planning practice is surely a very valuable addition to existing literature. Furthermore, the European climate goals provide an ideal, collective framework that was lacking in previous comparative institutional analysis (cf. Breukers and Wolsink, 2007).

1.4 Theoretical framework

This PhD thesis analyses wind power deployment from an institutional perspective. Here, the term 'institutional' refers not only to formally established rules, laws, and regulations but also to other influencing factors such as the norms and values that have become embedded into the fabric of social relations (Evers, 2004, p. 22). In the case of wind power, these could be, for example, deeply grounded attitudes with respect to landscape aesthetics and wellbeing.

Much of this understanding is based on established theories of policy analysis, such as the concept of Actor-Centred Institutionalism (ACI) developed by Mayntz and Scharpf (1995), and the wider intellectual theory of ´new institutionalism´ which is, according to Healey (2006),

> grounded in a relational view of social life, which focuses on people actively and interactively constructing their worlds, both materially and in the meaning they make, while surrounded by powerful constraints of various kinds. 7 (p. 35)

New institutionalism's starting point is thus the idea that the actual spatial outcome of a planning issue, such as the siting of wind turbines, is not produced by 'structures' or 'agency' (Giddens, 1984) alone but by an interaction between the two. Hence, planning institutions or ´structures´ do not dictate outcomes but, at

6 In 2009, the European Union adopted a target of a 20 % share of energy from renewable sources in the Community's gross final consumption of energy in 2020 (European Commission, 2009). The Directive moved wind energy to the centre as a promising addition to useful, low carbon technologies.

7 DiMaggio and Powell (1991), cited in Healey (2006).

the same time, they are not neutral to the outcomes as they do channel choices and constraints (Evers, 2004, p. 77).

The figure below (Fig. 5) presents my interpretation of the institutional relations between wind energy planning and implementation. The model was created on the basis of institutional analysis models developed by Mayntz and Scharpf (1995) and Ostrom (2005). The purpose of these models is to guide research on how institutions structure 'action situations' (Ostrom, 2005, p. 35).

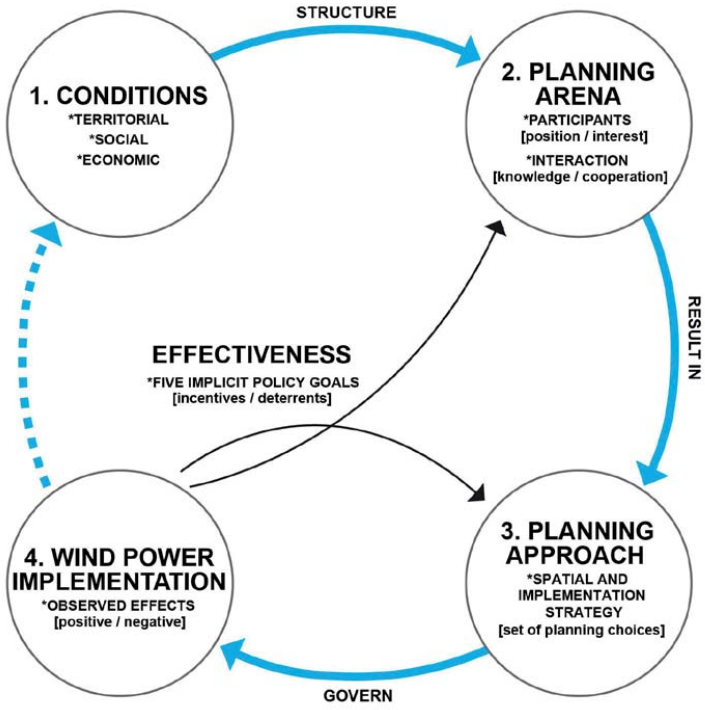


Figure 5. The four components of planning for wind power
Figure by the author

The conceptual framework proposes a circular process in which (1) conditions (institutional factors) structure (2) planning arenas (social interaction spaces). Conditions and planning arenas produce two kinds of outcomes: (3) planning approaches and their (4) implementation. Furthermore, (5) evaluative criteria are used to assess the effectiveness of planning approaches. These criteria refer to observed effects of both implementation and planning arena.

Among the four components of the conceptual framework, the planning arena is the focal level of the analysis. According to Ostrom (2005), an arena is ´the social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight´ (p. 14). 'Interaction' describes the way in which decisions were taken, e.g. through a shared vision or bargaining.

'Planning approach' refers to spatial and governance choices, formalized in policies, laws, and agreements. 'Effectiveness' relates to three key objectives: promoting investment, resource-aware treatment of land, and creation of social support.

1.5 Research question and methodology

The previous sections presented the relevance of the research in terms of research intention and contribution to the literature; they also conceptualised the object and framework of analysis. We now come to the overarching research question:

What planning approaches have been applied to implement onshore wind power in European urbanised regions and what is their effectiveness?

This question was elaborated on by exploring four sub-questions that were answered for each case study region in chronological order:

a) What (territorial/social/economic) factors have had an impact on planning decisions concerning wind energy?
b) What participants were involved in the decision-making process and what information was accessible?
c) Combining a) and b): in what ways did conditions and participants combine, resulting in regional planning approaches to wind power?
d) Evaluating b) and c): how effective has the chosen planning approach been so far?

Methodology

The purpose of a methodology is to define how research should proceed (Blaikie, 1993, p. 8). The orientation provided by the theory of 'new institutionalism' and the method of comparative spatial planning analysis are the two pillars of this investigation. The comparative approach allows the complexity and contradictions of real life to be the main source of learning. The underlying notion here is that context-dependent knowledge and expertise lay at the centre of the case study as a research method (Flybjerg 2006). The implicit hypothesis is that correlated evidence from the case studies is most likely to be valid for other regions with comparable institutional settings (Billé 2010).

The focus is on the regional (meso) level of planning. Positioned between local-level wind park initiatives and national-level energy policies, regions are deemed to

play a key role in managing the allocation of wind power technologies ‘endogenously’, thus taking into account regionally specific spatial characteristics.

The three regions of analysis are all situated in European Union Member States: South Holland (Netherlands), Lower Austria (Austria), and East Flanders (Belgium). The case study regions were selected for several reasons. All regions enjoy favourable conditions for wind energy generation and have adopted ambitious wind energy targets and endorsed zoned areas in their regional planning agendas. Another important selection criteria was the degree of spatial and functional heterogeneity. Large parts of South Holland, East Flanders and Lower Austria are covered by ´intermediate urbanised areas´ (Eurostat, 2011; Nabielek, Hamers and Evers, 2016) consisting of towns and suburbs. Moreover, according to the definition of the OECD (2012), the selected regions include the metropolitan areas of Vienna (peripheral area), Rotterdam/ The Hague and Ghent. The diverse, functional relationships between thinly, moderately and densely populated areas provide an ideal breeding ground for conflicts of interest that arise from the expansion of wind power. Wind farms might emerge either adjacent to established urban areas (e.g. in the rural-urban fringe) or in remaining rural and thinly populated areas.

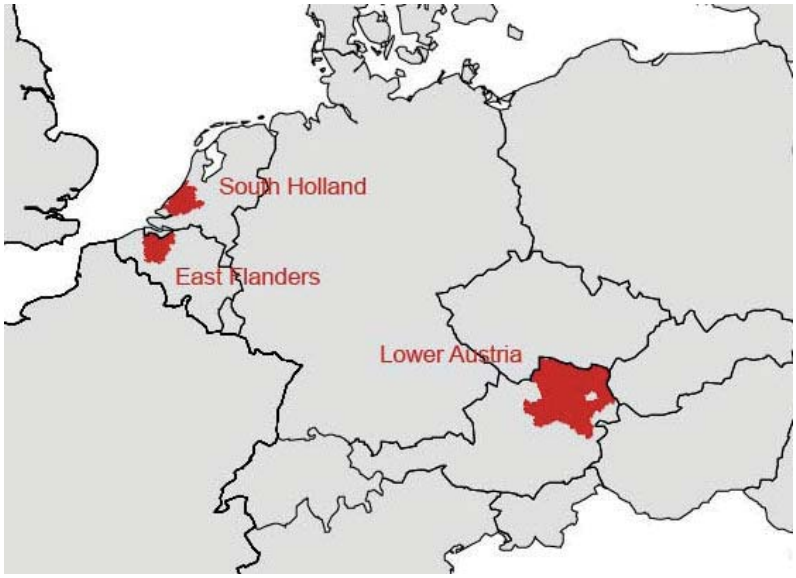


Figure 6. The three case study regions
Figure by the author

Both options constitute a dilemma for regional planning: While the first might conflict with the interests of local residential population, the second option is difficult to combine with recreation, cultural heritage and conservation interests.

All three regions face similar problem situations, but have come up with different solutions. Each case study illustrates a different spatial-territorial approach: wind parks in industrial areas (South Holland), in combination with agricultural land (Lower Austria), and clustered along transport infrastructure (East Flanders). These differences suit the objective of this thesis: to evaluate a variety of approaches. Although the three regions do not constitute a random sample, they have been chosen because their circumstances led to painful decisions and manifold solutions, thereby, according to Flyvbjerg (2006), offering a rich source of information:

> When the objective is to achieve the greatest possible amount of information on a given problem or phenomenon, a representative case or a random sample may not be the most appropriate strategy. This is because the typical or average case is often not the richest in information. A typical or extreme case often reveals more information because they activate more actors and more basic mechanisms in the situation studied. (p. 13)

Having introduced the overall methodology to arrive at scientific evidence, I now come to the research methods that were applied. Methods are the actual techniques or procedures used to gather and analyse data related to some research question or hypothesis (Blaikie, 1993, p. 8). Methods applied in this dissertation are in-depth conversations and semi-structured interviews[8], and the analysis of documents that were publicly available or were otherwise obtained in the course of the study. Interviewees were 26 representatives from the Netherlands, Austria and Belgium and from the fields of politics and public administration, mediators (consultants), and economic actors.

Furthermore, in order to test the transferability of my recommendations, a workshop was conducted with representatives of a fourth region — the Austrian state of Upper Austria. It was held at the end of the field work. This working step therefore explicitly did not belong to the empirical part of the thesis. Rather, my suggestions for action derived from the three case studies were critically reviewed by representatives of those for whom they were intended. The aim was to test if 'positively influencing' spatial and governance choices found in the three case study areas were transferable, i.e. in a comparable institutional setting.

The decision to select Upper Austria was motivated by considerations both analytical and practical. The state is characterised by good climate conditions as

8 A semi-structured interview is a qualitative method of inquiry that combines a pre-determined set of open questions (questions that prompt discussion) with the opportunity for the interviewer to explore particular themes or responses further.

regards wind energy generation and a considerable degree of urban sprawl. Another consideration was that the conduction of a workshop required reasonable knowledge of the institutional context and a good command of technical language. It was therefore not possible to select a region in a fourth country. Finally, what should be mentioned as well, is that this research was carried out at the Technical University of Vienna which made a further focus on the Austrian context reasonable.

Structure of thesis

The thesis is divided into four chapters. After our introductory chapter, Chapter 2 develops a theoretical framework and methodology to guide the comparative spatial planning analysis of the case studies. The next chapter, Chapter 3, is the most extensive part. It presents the empirical findings of the three case studies: South Holland, Lower Austria, and East Flanders. It draws conclusions based on the answers to a set of four sub-questions that were asked in each region. The final part, Chapter 4, reflects on the most salient lessons from the case studies and the methodology applied to conduct this research.

2 Theoretical and methodological foundations

This chapter explores the theoretical foundations of the thesis: the scientific mindset of ´new institutionalism´ and the methodological foundations to provide guidance for the case studies. We identify major choices that needed to be made to conduct the research. Building on these theoretical foundations, we conceptualise planning approaches to wind energy and provide a set of criteria to evaluate their effectiveness.

Furthermore, two very valuable theories in comparative policy analysis, Actor-Centred Institutionalism (Renate Mayntz and Fritz Scharpf) and Institutional Analysis and Development (Elinor Ostrom), are discussed. These theories provide tools enabling the construction of a conceptual framework for the comparative analysis of planning practice. In particular, the framework ensures that the selected regions are analysed in the same way, and makes it possible to detect congruent insights that are valid in a more general sense.

2.1 Conceptualising planning approaches and effectiveness

The theory of *new institutionalism* has been developed over a period of three decades. It comprises, and evolved from, different schools of thought, among which historical institutionalism, rational choice institutionalism, and sociological institutionalism. According to Hall and Taylor (1996), however, these different schools share a great deal of common analytical ground; the position of each school of new institutionalism can be interchanged and learned from within the context of the wider theory. It is therefore not our goal to present diverging positions here but, rather, to define common ground, based on comparable assumptions, for the purpose of this thesis.

New institutionalism starts from the notion that institutions do not merely reflect technical and economic considerations, but are formed by ´institutional forces´ (Powell, 2007). These forces include perceptions deeply embedded in social and political environments, such as the basic beliefs and conventions that are taken for granted in a certain setting. These societal norms or standards are usually not formalized but nevertheless they do shape the behaviour of individuals.

The theory thus emphasises that relational and cultural aspects of society shape institutions (DiMaggio and Powell, 1991; Healey 1997; Healey 2006; Powell, 2007).

According to this fundamental idea, practices and structures of institutions do not only respond to rules or norms of behaviour, they also redefine and shape them. Or, as Healey (2006, p. 47) argues, ´human agency acts upon culturally-bound structures of rules and resource flows, yet the structuring forces are remade in continually inventive ways´.

Although heavily drawing on the term ´institution´, new institutionalism does not provide a uniform definition; instead, there are ´points of divergence´ (DiMaggio and Powell, 1991, pp. 7-8). The term takes on a different meaning depending on the scientific discipline (economy, sociology, or political science) in which it is studied. Indeed institutions can be perceived as the product of conscious, rational human action or as the product of more informal, path-dependent forces, for instance a notion that has been developing slowly over the course of centuries (DiMaggio and Powell, 1991). Thus, according to this branch of reasoning, institutions do not only adopt rules or practices because of rational considerations regarding material aspects or well-being, but also because they are valued within a broader cultural environment.

Despite these different positions, a number of common goals define what institutional analysis should do, namely explore how social interaction is shaped by institutions and ascertain specific factors that are important in particular contexts. According to Ostrom (2005), the challenge of institutional analysis is ´to know enough about the structure of a situation to select the appropriate assumptions about human behavior that fit the type of situation under analysis´ (p. 7). Thereby, the common goal of different approaches within new institutionalism is to ´observe that institutions affect action by structuring expectations about what others will do (…) In one case, expectations are said to be shaped by what should seem instrumentally viable to the other actor; in the other they are said to be shaped by what should seem socially appropriated to the other actor´ (Hall and Taylor, 1996, p. 955).

Having introduced these main theoretical assumptions of new institutionalism, we now examine how these will shape the methodology employed to study wind energy practices in different regions of Europe.

2.1.1 Institutional factors

Wind power deployment, like any other large-scale spatial development, involves an array of activities such as analysing economic profitability, securing land, providing financing, and obtaining planning permits. Each activity involves interaction between different actors such as private developers, communities, and governmental agencies. These actors pursue (diverging) interests in relation to wind power. Depending on their resources, objectives, and the roles they play in

the wind power sector, their strategies may vary, ranging from promoting to constraining development.

Institutional factors, in turn, determine the nature of this interaction. Thereby, the term institutional refers not only to formally established rules, laws, and regulations but also to other influencing variables such as norms and values that have become embedded into the fabric of social relations (Evers, 2004). In the case of wind power, these could be, for example, the deeply grounded attitudes of a specific community to landscape aesthetics and wellbeing.

Summarizing this section, the principal orientation of this thesis is as follows:

Wind power deployment cannot be explained by technical and formal procedures alone, but also results from established beliefs about appropriate action.

This rather abstract definition allows the analytical approach in the three case studies to deploy a broader, richer definition of 'institutional factors': it is not only legislation and formalized practices that define the way in which institutions plan wind energy deployment, there is also a cultural dimension to which we should pay equal attention. For example, Toke, Breukers and Wolsink (2006) identified longstanding cultural dispositions about landscape as a determining factor of wind energy development.

Scharpf (1988) spoke therefore of the interaction of decision rules and decision styles when explaining policy choices. Hall (1996) noted that these rules can be interpreted as the interplay between the incentives that governmental institutions provide to effect ´rationally reasoned´ action and the culturally-embedded beliefs emphasised by DiMaggio and Powell (1983). In the case of wind energy, this is illustrated clearly by the interaction between generic rules (such as financial incentives for renewable energy) and the established collective commitment to the deployment of a certain energy source. While the first might create equal preconditions, the second introduces ´bias´, which might range from pro-active support to non-commitment and even opposition.

The term ´institutional factors structuring wind energy development´ describes factors that provide a justification for wind energy decisions about what is socially appropriate or what is materially advantageous or effective as regards energy output. However, the term is to be understood as an overarching concept rather than one that only addresses the regulatory dimension of spatial planning. As explained before, these factors do not necessarily relate to formal regulations (e.g. rules presiding over the licencing of wind parks or which tier of government has the power to approve licences), but they can nevertheless powerfully influence development. For instance, Toke, Breukers and Wolsink (2006) concluded that ´just as a favourable national planning framework is essential for wind energy deployment, so is a consistent system of generous, reliable subsidies´ (p. 1143). If we seek to evaluate the effectiveness of planning practices or approaches, we

therefore not only have to ascertain the factors that are important in a particular context but also to which extent development is influenced by planning choices or by external factors that are ´out of the scope´ of planning competence.

Hence it is necessary to briefly describe the position of planning institutions in this overall ´set of rules´ governing wind energy. Van Waarden (2009) defines institutions as ´an accumulation of (more or less) lasting social mutual expectations, from which a defined regulatory system emerged that governs social interaction´ (cited in Blum and Schubert, 2011, p. 70). This definition also applies to governmental spatial planning institutions that enact rules to regulate development in a (spatially) desired way. Planning approaches to wind energy are thus embedded in an institutional environment, the planning *system* of a country, which determines laws, stipulations, and established practices to organise spatial decisions. According to the theory of new institutionalism, these are not only driven by legislation, but also by normative and cultural/cognitive factors (Scott, 2001), such as the standard handling of competences and the cultural ´doctrines´ of planning (Faludi and van der Valk, 1994).

2.1.2 Planning and implementation actors

Our theoretical approach thus assumes that wind energy actors, in particular spatial planning policy-makers, are heavily influenced by institutional factors. This subsection will clarify what kinds of actors participate in wind energy decisions and what their principal interests are.

The precise definition of actors and the identification of key players, or decision-makers, is a task for the empirical part of this dissertation: the three regional case studies. At this stage, some basic assumptions have to be made to help us identify the key actors in wind energy planning.

The first fundamental assumption concerns the differentiation between individuals and organisations. According to Blum and Schubert (2011) a basic distinction can be made between individual and complex actors. Complex actors consist of many individuals. Scharpf (2000) differentiates further between cooperative and collective actors. The first describes action units with a legal personality (e.g. ministries, political parties, or universities) and the second applies to strategic alliances, clubs, or associations. What is important for us, however, is not the exact division between actor units but the extent to which they influence wind energy decisions. Thus individuals can be key players in planning just as much as large-scale organisations with numerous members, although they are usually equipped with much fewer resources.

The second assumption is that a differentiation can be made between actors mainly participating in planning decisions (e.g. a regional planning authority) and actors mainly involved in wind energy implementation (e.g. a wind power

developer). Moreover, there has to be an overlap between these two types of actors. This could be, for example, an interdepartmental working group that facilitates knowledge exchange between different sectors of administration and local-level wind energy initiatives and thus takes a central position in the decision-making arena (of both planning and implementation).

The third assumption is that these actors can be classified according to five ´actor dimensions´. These dimensions are based on the work of Hamedinger and Dumke (2014) and Dumke et al. (2016), who examined the spectrum of actors at the interface between energy and spatial planning. The five actor dimensions are as follows:

(1) public administration, for instance executive bodies of government, such as regional planning departments, directorates for energy infrastructure, ministries, or local authorities;
(2) civil society, for instance individuals such as local residents affected by nearby wind parks, landowners, or local interest groups;
(3) the economy, for instance commercial developers, energy cooperatives, alliances of developers, or wind energy associations;
(4) mediators[9], for instance landscape architects, energy planning offices, or nature and environmental organisations;
(5) politics, for instance mayors, municipal councils, state governors, or ministers.

The fourth and last assumption is that relationships between the parties involved in wind energy planning and implementation can be characterised, for example as intensive cooperation, consensus, or conflict. Moreover, there can be different tranches of collaboration, for instance one that centres on the participation of non-professionals in a wind energy planning process and one that relates to communication with professionals.

These four basic assumptions should provide answers to the following questions: which actors dominate planning decisions and, which parties hold key positions within the planning and implementation of wind energy? Concerning the first question, the Hamedinger and Dumke spectrum of actors is clearly helpful to identify dominating organisational networks. Concerning the second question, I choose to differentiate between planning and implementation actors, but also to highlight those parties/organisations/individuals that had a decisive voice in the planning process, i.e. in comparison to parties that had a supportive role. In theory, these ´core actors´ occupy a central (key-) position between other parties

9 In this thesis, mediators are defined as actors who mediate between administration and civil society or the economy. Their role is to provide consultancy services, but they are not neutral in the sector that they analyse.

and have an economic, political or territorial stake in wind energy deployment and thus are highly motivated to negotiate their interests.

2.1.3 Conceptualizing a planning approach to wind energy

Following the definition of actors and institutional factors, we will now describe what is meant by a 'planning approach to wind energy'. According to the understanding presented in the Introduction Chapter (Section 1.2, p. 28), a planning approach to wind energy delivers a strategic course of action, for example: installing a certain number of wind turbines in compact parks on predefined locations.

In the relevant literature, we can find two methodologies: one that emphasises land-use choices, i.e. when defining wind energy locations in regional development schemes (Cowell, 2010; Nadaï, 2012; Power and Cowell, 2012); and one that is more process-oriented, addressing the issue of incorporating local interests in sectoral energy policies (Breukers and Wolsink, 2007). This means that regional planning approaches to wind energy actually have a dual function: on the one hand, they organise development by allocating and rationing land resources, and regulating collective decisions at higher governance levels. On the other hand, they provide legitimating arguments for what is considered a desired implementation outcome; by ´asserting a moral duty to comply with them even if the policy in question is against one's interest or preferences´ (Scharpf, 2001, 2.1).

It is therefore to be assumed that planning approaches are ´anticipatory´ in their effects. They encompass not only the task of defining appropriate locations (spatial strategy) but also the task, within a chosen location policy, of promoting developments according to the anticipated goals of the approach (implementation strategy). These goals, however, are related to various considerations in planning that do not always go easily hand in hand with each other (see economic, territorial and social concerns in Section 2.1.3.1).

On the basis of the above considerations, two core elements have been defined which, together, constitute a regional planning approach to wind energy:

1) *A planning approach involves a territorial indication (maps) of places where wind power is considered desirable and of places where it is not.*
2) *A planning approach anticipates. It devises a strategy to guide future action within a specified spatial context and time period.*

The first element implies that, eventually, choices will have to be made in relation to conflicting interests and land uses in order to be able to draw the boundaries between wind power and other functions in a specific, geographic setting. This component is called the spatial strategy of a wind energy planning approach.

The second element is defined as the implementation strategy of a planning approach. It provides the ´moral duty´ (as Scharpf put it) to comply with policy, for

example the timely achievement of energy goals or the anchoring of high standards for the consultation of the local population about wind turbines. These two elements are discussed in greater detail in the next two subsections.

2.1.3.1 Spatial strategy

The spatial strategy essentially deals with differences of opinion about land use in relation to wind energy. Roughly speaking, these differences are related to economic, territorial and social goals in the spatial sphere. The entire spatial strategy may, however, also focus on a particular interest, for instance the provision of sufficient (land) resources to achieve energy goals.

Economic choices address the energy yield of land earmarked for wind energy. They deal with the conditions under which a wind turbine can run profitably, but also with the technical assessment of wind energy resources, for instance in terms of a ´maximum´ installed capacity. For these assessments, two factors are important: firstly, the amount of energy that can be generated and distributed from a particular location; secondly, the costs incurred to build, operate, and maintain a facility. The first factor includes location-specific requirements, for example, the ease of access to the area, expected wind conditions, physical obstacles, or power grid connectivity. The second involves site-related investment costs, the availability of capital, and government-guaranteed incentives for investment and operation.

Territorial choices deal with the desired spatial distribution of wind turbines, for instance whether wind parks have to be developed in a compact way on few locations or in a more dispersed way. Planning choices involve basic considerations, such as the application of generic rules and/or spatial-geographic criteria (see text box below) to a desired spatial orchestration of wind parks in a specific area. In this regard, one important decision is to define areas in which wind energy deployment is prioritised (positive zoning) or prohibited (negative zoning). The precise definition of the boundaries of these areas is usually based on social-choice decisions.

Social choices relate to the conditions under which the impacts of wind power are considered acceptable from a collective point of view. These conditions are composed of social values and norms that might vary greatly across time and place. Because wind turbines are very large structures that have considerable impacts on their environment and are visible from great distances, social decisions not only deal with health and safety issues but also with changes in the use and perception of landscapes, for instance landscapes that are used for farming, recreation, or solitude. A common type of planning decision in this category is the definition of land-use constraints to avoid the construction of wind turbines in natural settings and near residential land use. Other decisions may relate to

desired land-use combinations, for instance the clustering of wind parks with other large-scale infrastructure.

Zoning versus generic rules

A number of analysts (Nadaï and Labussière, 2009; Cowell, 2010; Nadaï, 2012; Felber and Stoeglehner, 2014) have studied various practices to define areas suitable for wind energy development at the regional level. Roughly speaking, there are two types: (1) the establishment of uniform guidelines, and (2) the introduction of zoned areas. While the first strategy controls the distribution of wind parks without any geographical reference, the second strategy defines specific areas, usually in the shape of a regional zoning scheme.

Zoning exercises may involve the drawing of exclusion areas or of implementation areas (aptly referred to as ´negative´ and ´positive´ zoning, respectively), or even make use of both approaches. The important point is that zoning both enables and constrains human action in the field of wind energy deployment. According to our theoretical approach, wind energy zones may therefore be viewed as institutions: they influence human action by structuring (long-term) expectations about which areas may be developed and which are protected.

2.1.3.2 Implementation strategy

In theory, implementation is the phase in which political intentions are transformed into measurable actions (Blum and Schubert, 2011, p. 126). A similar understanding is applied in this thesis. The implementation of a planning approach to wind energy starts when the policy in question is officially approved (by government decision) and ends when its objectives are achieved or changed, e.g. by adoption of a new policy. These objectives include non-measurable, i.e. qualitative standards.

In the implementation phase, planning decisions, formalised as laws and rules regulating wind power development, have to be translated into desired outcomes (for instance a wind energy growth target). For this reason, the implementation strategy also encompasses goals that are process-oriented and cannot be met through legal requirements alone. It is a governance task: controlling local implementation with the help of support mechanisms.

The control strategy, however, can vary. Geels and Kemp (2000) suggest two approaches:

> The steering question is difficult. There are, in principle, two possibilities: a design-approach that departs from a predefined objective (which could be, for example, a set target ´CO2-neutral energy system´ or concept (…) and a development-approach that departs more from dynamics and less from technologies and a set target. The latter still has a set target, that is guiding action, but the target will be constantly adjusted. (p. 54)

If we transfer these notions to wind power deployment, we can see that different implementation strategies are possible: one would actively promote emerging initiatives; the other could be more ´laissez-faire´ and would monitor the achievement of energy goals.

Among the possible issues that may be addressed in the implementation strategy, we find the level of decision-making at which projects are authorised. For instance, higher-tier planning institutions can impose development on lower-tier authorities by authorizing wind parks in top-down fashion. On the other hand, institutions can take a more liberal approach in economic terms and grant local autonomy as regards land-use decisions. The latter option relies heavily on the existence of a favourable investment climate, for example thanks to stable government subsidies. Another issue might revolve around standards for local participation in wind energy projects and the compensation of environmental costs, for instance disturbance of the surrounding landscape through physical emissions (noise, shadow flicker).

2.1.3.3 Spatial-organisational levels of planning decisions

The last paragraph of the previous section dealt with the spatial-organisational levels of wind energy policies. In this thesis, the focus is firmly on the regional level (i.e. in the case studies: provincial or state level). This, however, does not mean that these tiers of government are empowered to take planning decisions autonomously, independently from other tiers of government. According to Reimer, Getimis and Blotevogel (2014), European planning systems encompass several spatial tiers and therefore, the ´mutual interpenetration´ (p. 17) of higher-tier policies and local-level practices has to be considered. The analysts argue that a ´multi-scalar framework´ is necessary when conducting a comparative analysis of spatial planning systems. I agree with this point of view, assuming that national as well as local wind energy policies might be incorporated in regional planning schemes.

At the macro (supra-regional) level, national governments and agencies can provide rules that operate above the regional scale of planning. These may be formal regulations such as the division of power concerning the authorization of projects. Macro-level authorities may also formulate principles or reach agreements that secure their interests in the field of wind energy deployment.

The meso (regional) level is the focal level of this dissertation. At this level, planning institutions draft and adopt regional planning agendas, and govern their implementation. Meso planning has to incorporate both the concerns of higher governance levels and local, contextual values into a comprehensive scheme; it also carries out the horizontal coordination of wind energy with other (sectoral) policies.

The micro (local) level is the local implementation practice inherent in the rules of higher tiers of government, the project-level ´episodes´ (Healey, 2004; 2006). These can be spatially and organisationally very diverse, depending on the size and impact of a project. Wind energy projects usually require intermunicipal

collaboration because the impacts of large-scale developments often cross the administrative border of one municipality.

2.1.4 Evaluating effectiveness

In order to draw conclusions on the effectiveness of planning decisions, we must create a suitable evaluation framework. The basic orientation of the analysis is qualitative, which means that effectiveness will mainly be evaluated on the basis of assumptions rather than measurable effects. A distinction will be made between observed effects and their causes. Observed effects include the amount of wind power, increasing public opposition, and environmental impacts. Their causes are factors that either have a promoting (driver) or hindering (barrier) influence.

Our evaluation framework is based on considerations by Polski and Ostrom (1999), who have formulated some essential questions for the evaluation of policies. These are (pp. 7-8): how do observed outcomes compare to policy objectives? Which outcomes are satisfactory? Which are not? Which outcomes are most important? According to the authors, a crucial point of the evaluation is whether the case study-specific planning arenas helped to produce incentives leading to desired policy outcomes. This emphasis — the search for explanations for the effectiveness of planning approaches to wind power — is also my emphasis.

2.1.4.1 Desired effects of planning decisions

The effectiveness of planning decisions will be evaluated rather straightforwardly: there should be a direct link between planning decisions and desired, intended outcomes. In the following two subsections, the main goals of wind power policy will be summarized. Before proceeding, it is important to note that this subsection builds forth on Figure 4. on p. 27, which schematically describes the interplay between different concerns taken into consideration in spatial planning concerning wind energy.

Desired effects of spatial strategy

The most obvious goal of spatial decisions for wind energy is economic: to promote investment by securing a sufficient amount of land to meet wind energy targets. This objective is usually supported by rather technical exercises that produce estimates of land availability and of energy potential within a specific area.

A second desired effect relates to normative territorial issues. Wind turbines strongly compete with other forms of land use and, therefore, should be sited in clustered, compact parks (Schöne, 2007). The approach is normative or regulative: land is a common good that should be treated in a resource-aware way. The

objective is to create clarity about places where wind energy deployment is possible and those where it is not.

The third objective is to settle disputes about land use. Decisions concerning wind energy ´involve setting criteria of acceptability and applying them to particular projects´ (Szarka, 2007, p. 143). These criteria may include absolute land-use constraints and minimum distances from certain functions. Here, Nadai (2012) points out the importance of public reaction to qualitative aspects such as landscape and wildlife — beyond norms and land-use regulations.

Desired effects of implementation strategy

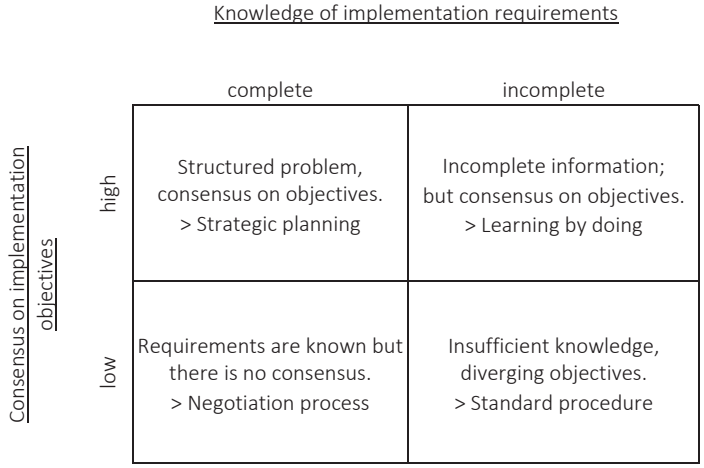
The desired effects of decisions fall into two categories: one is economic and concerns the timely implementation of energy goals. The other is about creating local value added thanks to wind parks. The latter has a moral or ethical background; it acknowledges the unfair distribution of benefits and impacts: while residents are suffering from the negative impacts of wind turbines, developers are netting profits. An increasingly relevant planning objective is therefore to institutionalise participation in planning as well as local ownership (Breukers & Wolsink, 2007, p. 2138).

Desired effects of planning process

The last theoretical discussion point in this subsection concerns the intended effects of the planning process. The development of a regional planning scheme to wind power is a highly complex matter involving various actors with sometimes matching, sometimes conflicting interests. In this type of planning exercise, wide-ranging consultation takes place in defined stages (Healey, 2006). The purpose of this consultation is not just to negotiate interests, but to provide the information needed for taking strategic decisions.

Douglas and Wildavsky (1983, p. 1) argue that when action and knowledge in a planning process are out of synchronization, implemented policies fail conspicuously because they pursue misguided objectives. This results in various problem situations, for which the authors propose different solutions, or directions in planning. The table below adapts the Douglas and Wildavsky categorisation for the purpose of this thesis (p. 48)

Table 1. Planning problems and approaches
Adapted from Douglas and Wildavsky, 1983



According to this overview, the following situations are possible:

- If the requirements for development are sufficiently well-known, and if there is agreement on the goals that should be achieved, then a solution proposal can be structurally worked out. The planning approach would then be a strategic one with a clearly defined mission statement.
- If there is sufficient information, but no consensus on goals, then planning would have to emphasise a communicative, participative process.
- If there is insufficient information about requirements, but there is widespread agreement on goals, then the planning process is characterized by 'learning'.
- If there is insufficient information about requirements, as well as widespread disagreement on goals, then the planning process falls back on standard procedures.

To conclude this subsection, I wish to take the position that complete/incomplete information and low/high consensus 'matters', certainly in the context of a long-term and contested planning issue like wind energy. The matrix however seems to suggest that the development of knowledge is a rather self-contained, technical exercise, separated from a wider social discourse about objectives. I prefer the position of Healey (1997; 2006) who recognises that all forms of knowledge are socially constructed. Hence, it is not the purpose to apply the matrix, but rather to pay attention to how and which type of knowledge is created during a planning process and how this relates to communicative practices in planning.

2.1.5 Conclusions

The theoretical approach developed in this section builds on ´New Institutionalism´ albeit without prioritising any particular branch of the theory. Rather, by applying this body of thought, a workable definition of ´planning approaches to wind power´ could be developed. The starting point is that the design and implementation of wind energy policies are heavily influenced by institutional factors (such as formal rules, shared norms and understandings, or standard operating practices) that vary in each region.

At the same time, planners are the 'creators' of institutions (e.g. wind energy zones) designed to manage this type of land use across space and time. I will argue that planning approaches to wind power are not limited to the rationing of land resources, but also institutionalise mutual social expectations about where and how wind power is implemented. Here lays the emphasis of this research work.

In the following subsection, the theoretical groundwork will be coupled with methodological approaches used in comparative policy analysis. This will lead to the development of a conceptual framework to guide our case study analysis in a systematic way.

2.2 Conceptual framework

The conceptual framework developed for this study is based on theories and models for institutional analysis conceived by the political scientists Renate Mayntz, Fritz Scharpf, and Elinor Ostrom. This section presents the theories underlying two established models: *Actor-Centred Institutionalism* and *Institutional Analysis and Development Framework*. Furthermore, it draws conclusions about the extent to which these two models are applicable to the topic of this dissertation.

2.2.1 Actor-Centred Institutionalism

In the middle of the 1990s, Renate Mayntz and Fritz Scharpf developed a new theoretical approach *Actor-Centred Institutionalism* (ACI) in order to observe ´governance and self-organisation on a level of whole societal subareas´ (Mayntz and Scharpf 1995, p. 39). In principle, ACI is about creating a framework for the comparative analysis of state activity (in the broadest sense) or, more precisely, the activities of organisations and collective actors, such as government agencies or business enterprises (Blum and Schubert, 2011).

ACI describes societal phenomena as the outcome of complex interactions between individual or composite actors that pursue various interests. These interactions are influenced by structural and institutional factors, the ´rules of which it can be expected that others will obey´ (Mayntz and Scharpf, 1995, p. 49).

Mayntz and Scharpf thus focus only on those rules that structure the actions of (a group of) actors in a particular decision-making process, the rules that accentuate the 'room for manoeuvre' of actors (Mayntz, 2009, p. 86).

If we relate ACI to the topic of wind energy implementation, this means that neither institutional rules nor the executive actions of actors (e.g. wind power developers) alone determine spatial decisions. Wind energy implementation is rather the outcome of *interaction* between the two. Hence, planning institutions cannot dictate outcomes but, at the same time, they are not neutral to the outcomes since they do channel choices and constraints (Evers, 2004, p. 77).

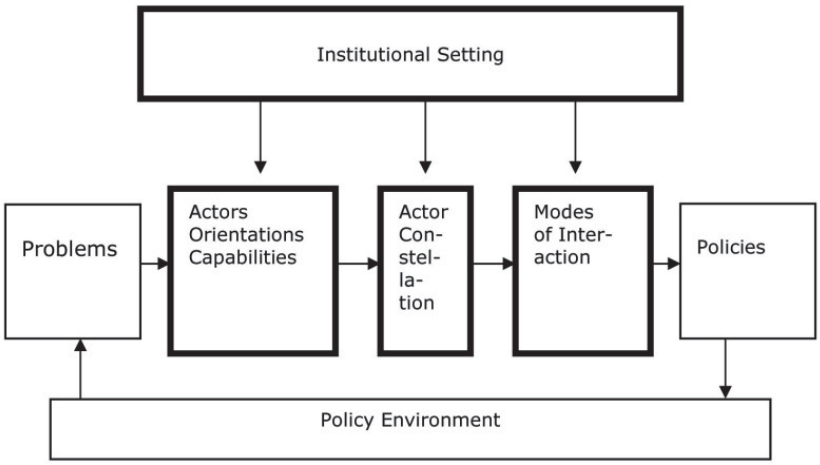


Figure 7. ACI framework by Mayntz & Scharpf, 1995
Source graphic: Scharpf, 1997, p. 44

The figure above is a representation of the ACI model developed by Mayntz and Scharpf (1995). ACI has four main components, which are indicated in the graphic by boxes with bold outside borders. The four components are positioned between initial ´problems´ and final ´policies´ (outcome of action), and describe:

- the various *actors' orientations and capabilities*. These concern, for instance, the interests and motives on the basis of which actors perform actions, and the degree of agreement concerning decisions.
- the *actor constellation* in a decision-making process, which relates to interdependent action. The constellation describes the actors involved, their strategy options, the outcomes associated with strategy combinations, and the preferences of the actors for these outcomes (Scharpf, 1997, pp. 44-45).

- the *modes of interaction* to come to decisions. These can differ widely in character: any given actor constellation can communicate through a variety of modes of interaction (Scharpf, 1997, pp. 45-47). It matters, for example, whether hierarchical, top-down governance or a system of majority voting is applied to achieve a particular outcome (Blum and Schubert, 2011).
- the *institutional setting*, which influences actors' orientations, constellations and modes of interaction. The institutional setting is not confined to legal provisions only, but includes societal norms, conventions, and expectations.

ACI empirically identifies the various components of a political control task (such as wind energy deployment), as well as the causal connections between rules (or institutional setting) and actions taken by (different types of) actors. The model has thus an explanatory rather than an evaluative function.

The investigation of these core components of policy-making and the connections between them cannot be achieved solely through quantitative methods of analysis. More appropriate methods include document analysis, aggregated data of qualitative and quantitative facts, and interviews with key actors (Schrabe, 2012). As Mayntz (2003) explained:

> Causal reconstruction does not look for statistical relationships among variables, but seeks to explain a given social phenomenon — a given event, structure, or development— by identifying the processes through which it is generated. Causal reconstruction may lead to a (more or less complex) historical narrative, but in its theoretically more ambitious version, causal reconstruction aims at generalizations - generalizations involving processes, not correlations.

2.2.2 Institutional Analysis and Development Framework

The theory of Institutional Analysis and Development (IAD) was developed by Elinor Ostrom, a political scientist, at around the same time that the ACI framework came into being. The following figure (Fig. 8, p. 52) shows a representation of Ostrom's IAD model of 2005, which is an adapted version of earlier models (cf. Ostrom, Gardner and Walker, 1994, p. 37).

IAD and ACI share some similarities in intent and structure (Ostrom 2005, p. 29), but IAD explicitly includes the evaluation of interactions and outcomes as a second objective (Polski and Ostrom, 1999, p. 6). Like the ACI framework, IAD differentiates between a regulating environment and human behaviour, and explores the ways in which rules may structure actions (Ostrom 2005, p.17). Its main purpose is to enable scientific explanations of 'how different governance systems enable individuals to solve problems democratically by modifying rules at various levels' (Ostrom, 2005, p. 29).

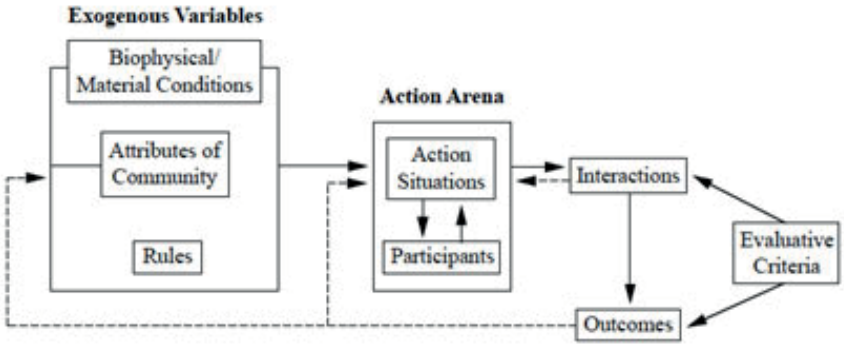


Figure 8. IAD (Institutional Analysis and Development) model
Source: Ostrom, 2005 (adapted from Ostrom, Gardner, and Walker, 1994, p. 37)

In order to provide a structured approach to comparative policy analysis, the IAD framework presents a chain of five interconnected ´holons´[10] as core components of the empirical work. Among these holons, the focal level is the *Action Arena*. Furthermore, the desired focus of each holon can be adjusted according to the preferences of the researcher.

Ostrom summarizes the interplay between the various IAD holons as follows:

> (…) exogenous variables affect the structure of an action arena, generating interactions that produce outcomes. Evaluative criteria are used to judge the performance of the system by examining the patterns of interactions and outcomes. Outcomes feed back onto the participants and the situation and may transform both over time. Over time, outcomes may also slowly affect some of the exogenous variables. (pp. 13-14)

This condensed introduction to the main components, or holons, of the IAD framework calls for further explanation. The following subsections provide a brief overview of how the five holons (*Exogenous Variables*, *Action Arena*, *Interactions*, *Outcomes* and *Evaluative Criteria*) can be interpreted and used for the purpose of this thesis.

According to Ostrom (2005), *Action Arenas* consist of two main elements: the situation in which an action takes place (in short: *Action Situation*) and the *Participants* in this situation. Participants are decision-making entities assigned to a position and capable of making choices within a confined set of alternatives. Participants can represent the interests of individuals, collective bodies, or corporate organisations and may occupy several *Positions* at the same time. Positions, in turn, describe the linkages between Participants and their actions. Participants can take one or more Positions depending on their interests and capabilities. Since the holder of a Position is usually constrained by a set of

10 Concept of *holon* by Arthur Koestler (1969). A holon is something that is simultaneously a whole and a part.

authorized actions, the nature of a Position determines the 'standing' of a Participant in an Action Situation.

Next to Participants and their Positions, other variables may characterize an Action Situation. These include the types of information generated, and the gains and losses assigned to actions and outcomes. Participants, for example, may act on the basis of complete or incomplete information about potential outcomes. Potential outcomes are (expected or assessed) physical transformations or material rewards assigned to a chain of actions and results.

Exogenous Variables are those factors that determine the structure of an Action Arena and drive the actions of Participants. Exogenous Variables include three types of sub-variables. These are: (1) *Rules* that arrange the relationships between participants, (2) *Biophysical/Material Conditions* such as resources, goods, services, and technology, and (3) *Attributes of Community* that relate to the size, composition, and shared (or unshared) values of a community.

Like Mayntz and Scharpf, Ostrom (2005, p. 16) suggests concentrating on the first Exogenous Variable (Rules) if the analysis focuses on how institutions govern human actions. Again, in line with Mayntz and Scharpf, 'rules' are interpreted in a wider sense than legal regulation:

> rules (…) are defined to be shared understandings by participants about enforced prescriptions concerning what actions (or outcomes) are required, prohibited, or permitted (…). (p. 18)

In this understanding, Rules, or 'the set of instructions for creating an action situation' (Ostrom, 2005, p. 17), include not only legislation and government regulations but also the self-organised rules of individuals as well as 'unwritten' shared rules, such as norms or precepts and physical laws. Thus, Rules can have a formal or informal character. In institutional analysis, the first step is therefore to understand those formal and informal rules that participants refer to when making decisions. Rather than concentrating on rules that can be articulated but not widely observed, the researcher identifies the set of *'Rules-in-Use'* (Polski and Ostrom, 1999, p. 15) and classifies them according to their impact.

Exogenous Variables and Action Arenas combine into *Interactions* and *Outcomes*. By interacting with one another, participants make choices and design outcomes. By focusing on the particular outcomes one is interested in, relevant patterns of interaction can be identified. These patterns usually include market structure, information flows, and the structure of political participation (Polski and Ostrom 1999, pp. 7-8). On the subject of Outcomes, Ostrom suggests differentiating between physical results and material rewards/costs, on the one hand, and the valuation participants assign to physical and material outcomes, for instance whether they are desired or undesired, on the other hand. Research can also differentiate between intended and unintended outcomes.

Evaluative Criteria are applied to Interactions and Outcomes in order to assess the performance of a system.[11] They consequently refer to the (physical or material) results as well as to the actions and choices that led to these results. The crucial point of interest is the extent to which rules, combined with physical/material conditions and community attributes, generate positive incentives leading to desired outcomes (Ostrom, 2005, p. 26).

The IAD model, according to Ostrom (2011), is compatible with several theories, for instance: economic theory, game theory, transaction cost theory, social choice theory, covenantal theory, and theories of public goods and common-pool resources (p. 8). The model has thus been designed for a wide range of policy analysis, which might vary in its theoretical orientation. It provides a general set of variables that can be used to analyse all types of institutional arrangements (p. 8).

2.2.3 Reflections on ACI and IAD

After this introduction to the ACI and IAD models, let us briefly reflect on how far they can be applied for the purpose of this PhD thesis.

ACI constitutes a suitable conceptual approach to the analysis of regulatory mechanisms that influence (the actions of) actors involved in wind power deployment. Furthermore, it provides a well-structured method for a comparative case study analysis. However, an essential part of our empirical analysis will concern the evaluation of wind energy implementation, i.e. how far planning choices and related processes have succeeded in producing a desired outcome. For this purpose, ACI is of little help because it does not suggest a structured approach to judging or evaluating the *effectiveness* of policies.

IAD, on the other hand, addresses both key issues of this study: on the one hand, explaining what underlying variables, or rules, drive spatial decisions concerning wind power and, on the other hand, the assessment of the ´effectiveness´ of these decisions. In other words, the case studies will explore how actual developments `on the ground´ relate to the stated objectives of the spatial planning approaches. IAD also provides the flexibility needed to specify which elements are particularly relevant to answer our research question.

Ostrom's IAD is therefore slightly better suited to the approach embraced by this thesis than the ACI model of Mayntz and Scharpf. Its advantage is that it allows for a holistic overview of the entire process of policy-making, implementation, and evaluation. The main difference with ACI is that it includes the evaluation stage.

On the other hand, the two theories have many similarities: for instance, both emphasise the influence of institutional factors on the priorities of individuals and

11 Evaluation may be empirical or theoretical, depending on whether one deals with observed or predicted outcomes.

composite actors. While IAD accentuates rules, ACI puts more emphasis on social interaction processes. It is therefore perfectly legitimate to start from the analytical components of IAD and broaden them with concepts and explanations provided by ACI about different actor types (individual, collective, or corporate) and modes of interaction.

2.2.4 A customised framework for regional case studies

The conceptual framework applied to evaluate planning approaches in the three case studies is presented in
Figure 9

Figure 9 (p. 56). The framework builds on the ´holons´ of Ostrom´s IAD, but their content is specified according to the theoretical and analytical choices discussed in the previous subsection.

The framework differentiates between four interdependent dimensions of wind energy policy-making and implementation: conditions, planning arenas, planning approaches, and wind energy implementation. It is argued that ´*conditions*´ affect the structure of the ´*planning arena*´; this leads to interactions that produce a blend of policies, spatial plans, and procedures: the ´*planning approach*´, and outcomes: ´*wind energy implementation*´. Let us now discuss these four interdependent components in greater detail, in particular what they mean in connection with the three case studies.

Conditions

The *conditions* are those institutional variables that drive planning decisions concerning wind power. According to Ostrom's (2005) definition of *Exogenous Variables*, these include — next to legislation — deeply rooted societal norms and conventions, as well as the relevant territorial conditions. I differentiate between three categories of institutional factors:

Territorial factors relate to biophysical circumstances affecting wind power generation and to regulative aspects in spatial planning, such as: wind conditions, degree of urbanization, established practices and distribution of power in spatial planning, and framework laws related to energy and environment policies.

Social factors concern community aspects, and shared values and beliefs, for instance: attitudes/actions of local residents and politicians, local value of the landscape, and degree of regional cohesion.

Economic factors relate to the structure of the wind energy market, developers, and financial incentives, such as: place-based initiatives, emerging types of investors (e.g. utility companies, energy cooperatives), and types of financial support.

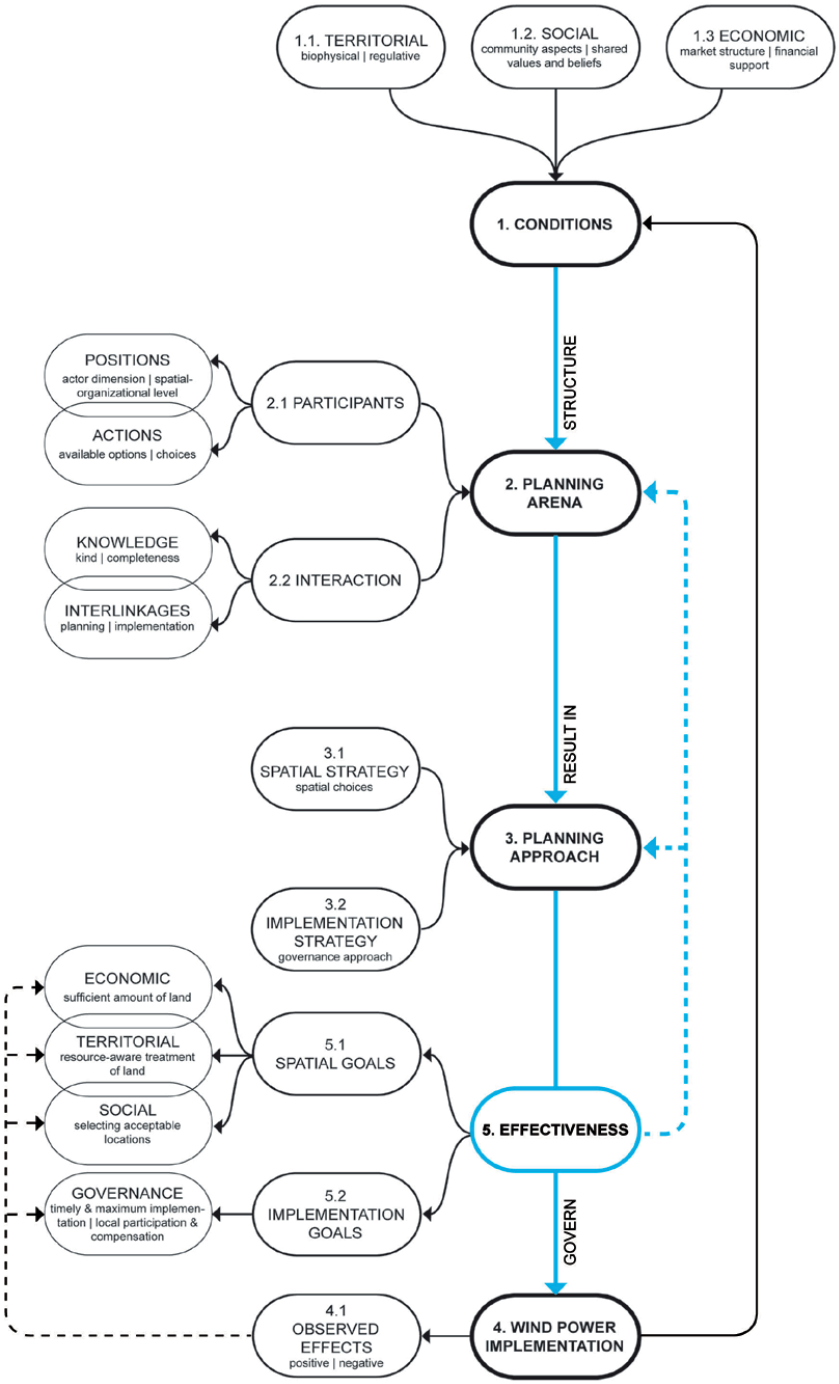


Figure 9. Conceptual framework (long version)
Figure by the author, adapted from Ostrom, 2005 and Mayntz and Scharpf, 1995

Planning arena

The *planning arena* describes the setting in which actors are brought together to make choices from an available set of alternatives. Actors in the arena are decision-making entities that represent either individual or composite interests. Here the focus is on the identification of core planning actors and other key players, knowledge generation, and the ´modes of interaction´ applied to arrive at planning decisions. Actors are positioned according to their interests and their scope of action (actor dimension) as well as according to the spatial-organisational level (macro, meso, or micro) at which they operate (see Fig. 10, p. 58). Furthermore, for analytical purposes, a differentiation is made between actors who participate in planning decisions (planning and planning core actors, see Section 2.1.2 on p. 40) and actors who are mainly concerned with implementation (implementation actors).

Planning approach

Conditions and Planning Arena result in the *planning approach*. The latter encompasses the adopted spatial and implementation strategy, as well as the sum of procedural parameters to authorize, refuse, promote, and govern wind power initiatives. These decisions are formalized in policies, laws, or other formal documents at various spatial-organisational levels (macro, meso, or micro). These may concern, for instance, zoned areas, spatial guidelines, preferences concerning land-use combinations, energy targets, or forms of cooperation between different tiers of government. For analytical purposes, it will be indicated whether these choices relate to economic (E), territorial (T), social (S) or governance issues (G). This will help later on to summarize the priorities of the planning approach in each case study.

Implementation

Planning approaches are shaped by conditions but, at the same time, they may alter these conditions. Implementation is the phase during which the anticipated effects of a policy can be observed and assessed. This concerns measurable as well as perceived impacts.

Effectiveness

In order to evaluate interactions within the planning arena and the observed effects of planning approaches, five implicit policy goals that are relevant for all three regional case studies have been defined. These are: (1) sufficient amount of land to meet wind energy targets, (2) resource-aware treatment of land, (3) selecting acceptable locations, (4) maximum and timely implementation of goals and, (5) local participation and compensation.

On the basis of these goals, pre-formulated for research purposes, effectiveness is assessed according to the valuation that interviewees assign to the outcomes. Documented or measurable effects are also considered during the evaluation. Fundamentally, what is at stake is whether planning decisions and planning arenas have generated positive incentives (drivers) leading to desired implementation outcomes.

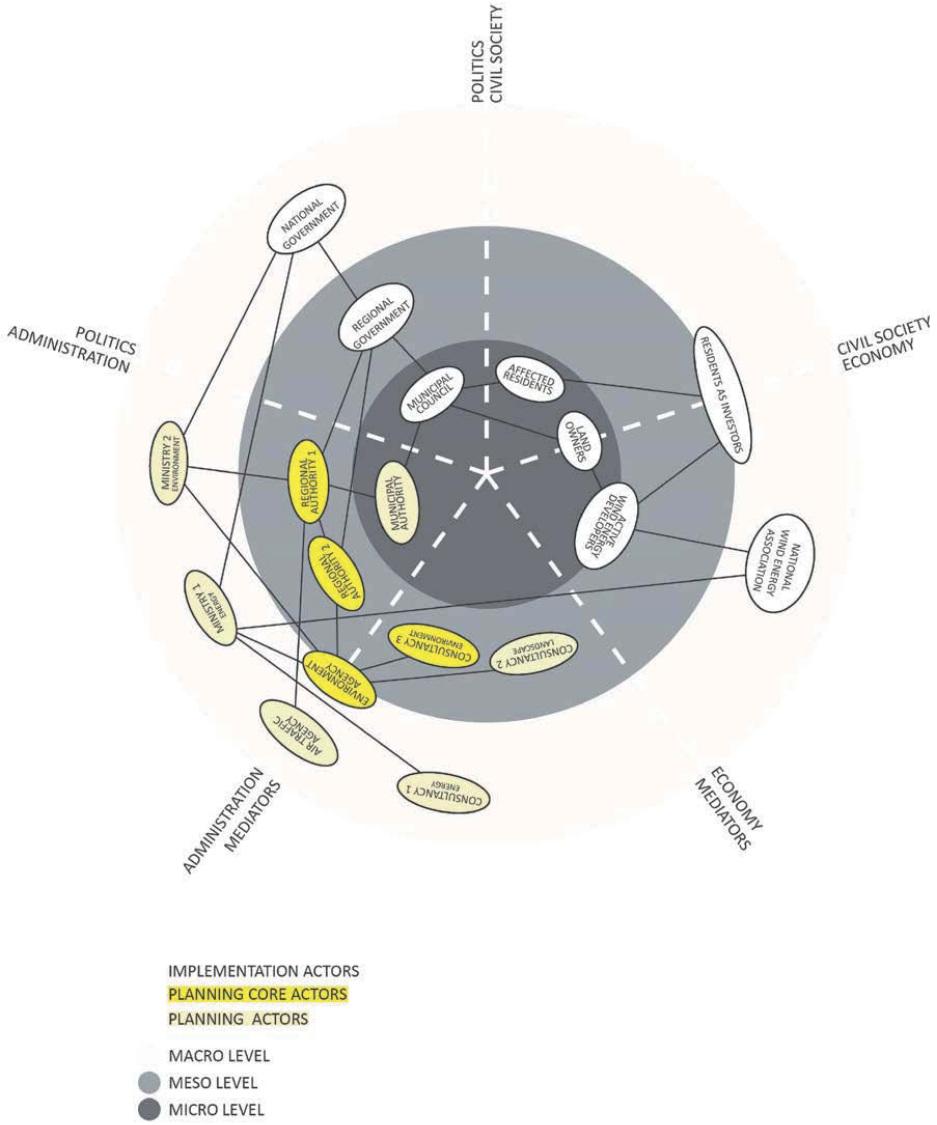


Figure 10. Actor map showing the positioning of actors within the wind power planning arena (indicative selection of actors and positions)
Figure by the author, mapping method adapted from: Dumke, Kronberger-Nabielek and Weninger, 2016.

3 Wind power planning approaches and their effectiveness: the cases of South Holland, Lower Austria and East Flanders

3.1 Wind turbines need a landscape narrative: the case of South Holland (Netherlands)

Figure 11. Wind energy implementation in Rotterdam harbour.
Photograph taken by the author

3.1.1 Introduction

When, in 2008, the European Union decided to fight against climate change, it was high time to make the Netherland´s energy supply more sustainable. The country, world famous for its seventeenth century windmills, lagged behind most EU member states as regards renewable energy supply (PBL, 2014). One justification was that the country´s geographic conditions were unfavourable. Large-scale exploitation of hydro energy was out of the question: although there were large flowing water resources, differences in altitude were too limited. The temperate climate constrained the generation of solar energy and, for the utilization of domestic biomass, the country was too densely populated. The potential of geothermal energy was altogether more promising, but exploiting this energy source would imply a substantial expansion of infrastructure. Hence, taking into consideration limited natural resources, cost-efficiency, and time pressure, the Dutch government chose wind energy as the best of difficult options.

While wind power became the precursor of Dutch renewable energy, development had stagnated to alarmingly low growth rates. This induced governmental measures that would speedily improve conditions for investment. In 2009, the Federal Government of the Netherlands announced its intention to achieve a renewable energy target of 14 per cent in 2020. One component of the future energy portfolio was a 2020 wind energy target that would triple the country's installed capacity within eleven years.

> The national government, the provinces and the municipalities formally agreed to increase the total onshore wind energy capacity to (at least) 6000 MW. The spatial accommodation and clustering of more and larger wind turbines has created a new planning challenge in our country. (RVO, 2016)

Legal provisions to secure a smooth implementation of the 6000 MW 'planning challenge' quickly followed. An amendment to the Dutch Electricity Act of 1998, transferred the power to authorize large-scale wind energy developments from provincial authorities to the national government. This concerned wind parks with more than 100 MW installed capacity. As regards less extensive developments, the twelve Dutch provinces retained the responsibility for permit-giving.

Thus the national government was ideally equipped to promote implementation. But instead of becoming a growing energy source, wind power turned into a bone of contention within Dutch spatial planning. The responsibility for spatial decisions at the national level was divided between two ministries that did not always see eye to eye on the matter of wind power. While energy policy fell under the responsibility of the Ministry for Economic Affairs, spatial policy was the responsibility of the Ministry for Infrastructure and the Environment. In other words, an argument started at the national level: while one party was arguing for a strategic spatial approach to avoid initiatives on 'wrong' locations, the other party was arguing for more market freedom.

For their part, Dutch provinces did not appreciate the intervention of national government. They were used to taking responsibility for wind energy developments on their own territory and, moreover, wished to proceed with their own plans. The argument of the Ministry for Infrastructure and the Environment was that provincial wind energy plans should not differ too much from the spatial planning strategy of the national government. The Ministry for Economic Affairs was more concerned about how provinces would manage 6000 MW of wind power. When the wind energy potential of earmarked provincial land was investigated, it still lay well below the target. Subsequently, this resulted in bargaining rounds between national government and provinces about the allocation of the national wind energy target.

Around 2012, affected ministries and provincial governments came to an agreement. Dutch provinces would offer land earmarked for large-scale developments to the national government, and this would be synthesized into a

national structure plan for wind energy. Comprehensive schemes for the allocation of smaller wind parks would remain a task for provincial spatial planning. The 6000 MW target was to be distributed over all twelve provinces. Furthermore, an overall energy agreement should unite the forces of national government, provinces, and other affected stakeholders in order to guarantee its implementation.

Thus wind energy policy was born in the Netherlands. Following this short introduction, we will turn to the planning approach of the Dutch province of South Holland. The first part (Section 3.1.2) will introduce the factors that significantly influenced planning decisions by the Dutch province of South Holland. The evidence is based on interview data and complemented by document analysis. After that, the interaction between the main participants within the South Holland wind energy planning and implementation arena will be presented (Section 3.1.3). The third and fourth part (Sections 3.1.4 and 3.1.5) will summarize the components of the planning approach chosen for wind energy and will discuss findings about the effectiveness of planning decisions related to wind energy. The chapter will end with a discussion of the conclusions of each sub-question.

3.1.2 Conditions

This section will identify the factors that structured wind energy planning in South Holland. The introduction already presented some important institutional factors that drove the actions taken by authorities at different levels of government. For instance, the determination of the Dutch government to deal with land-use planning for wind energy at a national level put South Holland and other Dutch provinces under pressure to modify their regional development strategies and designate land for the adopted 2020 energy target. Some biophysical, social, and economic factors also impacted wind energy deployment during the spatial planning decision-making phase.

Figure 12 (p. 64) displays the main time periods of wind energy planning in South Holland in chronological order. This information is then overlaid with annual growth figures (MW installed capacity) for wind energy in South Holland / the Netherlands and the provincial / national 2020 energy targets. The underlying information needed to develop this figure was obtained through intensive document analysis, which scheduled important events in wind energy planning and implementation into phases (more detailed information in Appendix B).

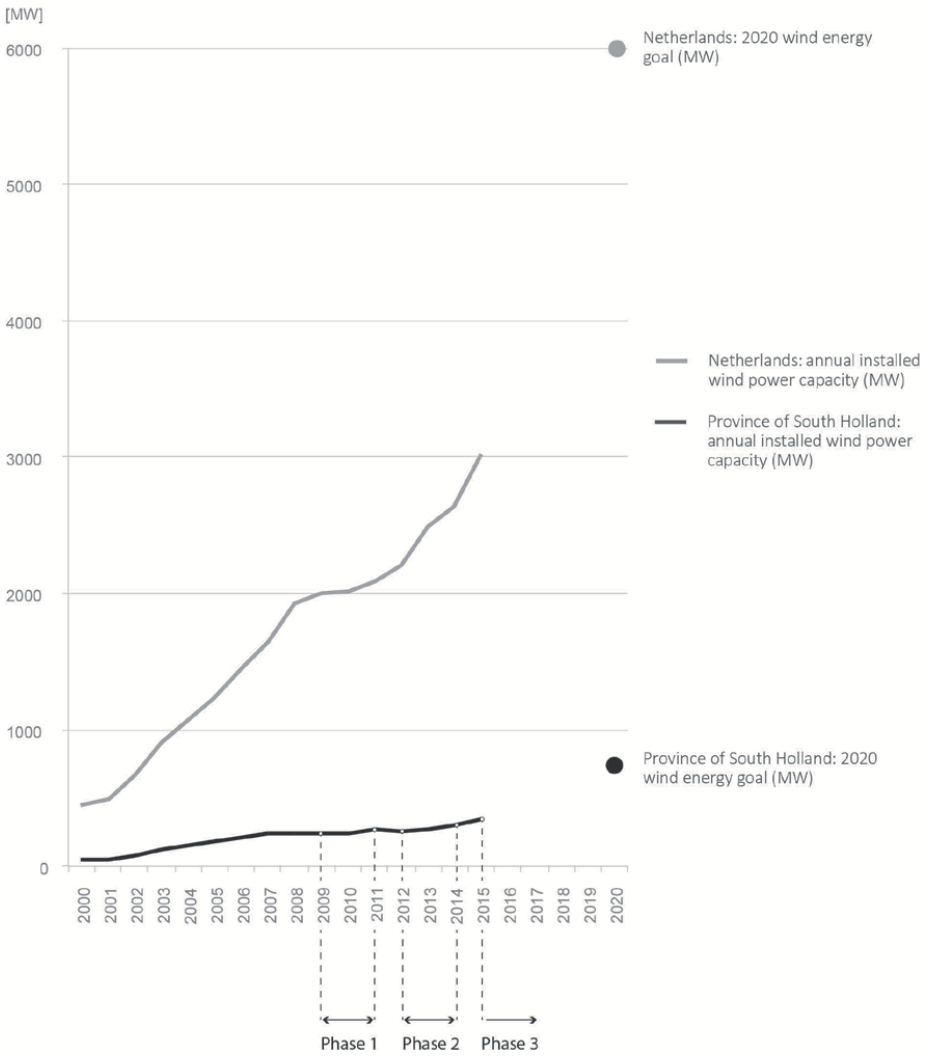


Figure 12. Wind energy growth and planning phases in South Holland
Figure by the author, wind energy data: CBS, 2017

Phase 1, 2009-2011: From general rules to a spatial-geographic planning approach
Formalized as: *Nota Wervelender* sectoral plan for wind energy (2011)
Phase 2, 2012-2014: Earmarking land for wind energy targets
Formalized as: VRM provincial structure plan (2014) and SvWOL national structure plan for onshore wind energy (2014)
Phase 3, 2015-2017: Regaining land and building up support
Formalized as: review of the VRM wind energy zones (2017)

The reconstruction of the planning and implementation timeline in the case of South Holland is illuminating. For example, we can see that the context in which wind energy policy was implemented had been rather unstable during the previous eight years. From 2009 to 2014, provincial spatial planning policy changed twice. At the same time, investment in wind energy stagnated for several years. The first policy change came with the adoption of a sectoral plan for wind energy, *Nota Wervelender,* in 2011. The second change came with the conclusion of the *Visie Ruimte en Mobiliteit* (VRM) of 2014, a provincial structure plan. After 2014, a slight increase in investment could be observed. Since 2015, a third policy modification has been under development: a review of the VRM wind energy zones within the context of the *Partiële Herziening Visie Ruimte en Mobiliteit*.

For analytical purposes, on the basis of Figure 12, a differentiation has been made between periods of planning and periods of implementation of the South Holland approach. We can narrow down the decision-making process for the spatial planning policies *Nota Wervelender* and *Visie Ruimte en Mobiliteit* to a period of roughly two years, 2009-2011 and 2012-2014, respectively.

3.1.2.1 Aggregated results of document analysis: developments in spatial and energy planning in the Netherlands and South Holland before 2014

The timeline of wind energy planning and implementation on Page 64 reveals that planning decisions in South Holland related to transactions or other developments before 2014. This section therefore will introduce the reader to the main institutional developments that took place at the national and provincial levels during the same period, roughly between 2009 and 2014. The findings relate to the general Dutch spatial planning system as well as to established practices in land-use planning for the allocation of wind farms.

National context

In the early 2000s, the Dutch spatial planning system was widely acknowledged as a perfect example of a ´comprehensive integrated approach´ (European Commission, 1997; Faludi, 2004; Evers and Tennekes, 2016). This approach was one that favoured achieving synergies between various sectoral goals and coordinating plans systematically from the national to the local level.[12] The Dutch Spatial Planning Act provided that all three levels (national, provincial, local) of spatial planning should have access to the same legal instruments, including

12 Over the past fifty years, in the Netherlands, several integrated national planning policies and schemes have been turned into reality, leading to the development of new towns, protected landscape zones, and suburban expansion areas. A famous example is the Green Heart area in the central area of the Randstad ring of cities, in which large-scale urbanisation has been prevented.

changes in land-use plans (OECD, 2017). If a higher-tier interest was concerned, national and provincial authorities would essentially be allowed to overrule local plans.

Since then, the comprehensive orientation in national planning has become more limited. Substantial parts of national spatial planning responsibilities have gradually been transferred to authorities at a lower governance level: the twelve provinces and 390 municipalities. One of these responsibilities was the task of coordinating the spatial impacts of renewable energy on landscape (Evers and Tennekes, 2016). Dutch provinces had therefore created plans for wind energy single-handedly and applied various approaches to allocate the generation of this energy. Some of the provincial plans were rather well-prepared – e.g. the province of *Groningen* had soon selected *zoekgebieden* (investigation zones) for wind energy. In other provinces, wind energy was hardly considered a spatial planning issue; thus location choice for wind turbines was left to market players.

> *While some provinces already had mapped down locations for wind energy in a most detailed way, others had no more than a rough indication on a regional map – 'around there' should be wind energy.* (Expert 03, administration, 2016)

In provinces enjoying good wind conditions, development unleashed during the first decennium of the twenty-first century had a lasting effect on the living environment of the rural population. Confronted with wind parks in their backyards, affected local authorities and local residents expressed considerable opposition. The emerging public debate about higher-tier energy goals and lower-tier environmental impacts induced landscape planning professionals to suggest a more qualitative approach to deal with wind energy.

The national consultant for landscape planning, Yttje Feddes (2010), argued that one reason for local opposition was changes to the landscape imposed by wind turbines. In her opinion, public support for wind energy could be regained by creating a 'landscape narrative' for wind turbines.

> Without a good 'landscape narrative' it won't be possible to achieve sufficient support for the national wind energy goals. But it is not only support that is concerned: there is actually too little knowledge so far about the impact of large numbers of new mega-turbines on the beauty and variety of our landscape. (Feddes, 2010, pp. 7-8)

Feddes advised that wind turbines should be sited in a 'choreographed' way rather than 'randomly', i.e. in correlation with the landscape's main features. A good spatial choreography would combine wind turbines with built structures such as ports, embankments, water channels, and industrialized agricultural land-use. Furthermore, wind energy developments should be structured into designated 'areas for concentration' and 'vacant areas' (Schöne, 2007).

Growing complaints about large-scale landscape blight and alarming figures about low wind energy growth stimulated the Dutch government to intervene in provincial planning affairs. It announced its intention to draft a national spatial

planning policy that would provide stable conditions to achieve the national target. As a first step, a new goal — making 'room for the energy transition' — was introduced in the SVIR[13] National Structure Plan for Infrastructure and Spatial Planning (2012).

> In the SVIR the national government has marked specific areas for wind energy based on natural characteristics, landscape features and wind speed. Within these areas the national government will cooperate with the provinces to define locations for large-scale wind energy. (Dutch Ministry for Infrastructure and the Environment, 2012, p. 35)

The SVIR introduced large-scale 'opportunity areas' for wind energy developments (Fig. 13). These areas had to be worked out in greater detail by the affected Dutch provinces. The legal basis for the intervention of the national government was an amendment to the Electricity Act of 1998, which launched a change in legal power authorizing wind energy projects. Spatial decisions concerning large-scale developments of more than 100 MW became a national (instead of provincial) competence.

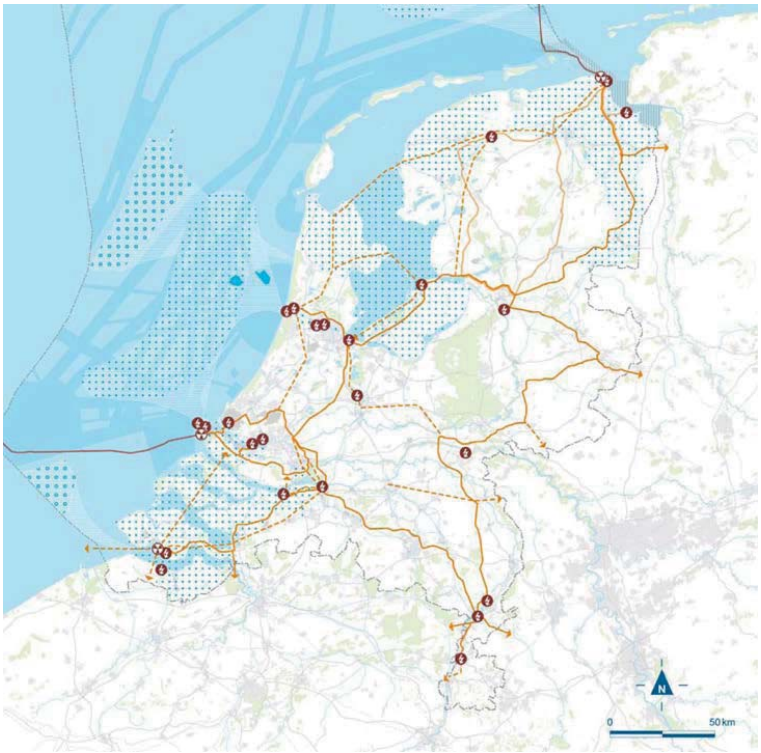


Figure 13. Opportunity areas for wind energy in the SVIR (2012)
Source: Dutch Ministry for Infrastructure and the Environment, 2012

13 Structuurvisie Infrastructuur en Ruimte.

Energy and spatial policy in South Holland

When the SVIR of 2012 announced its goal, namely a coherent national planning approach, South Holland was struggling with homemade wind energy plans. The province had adopted a 2020 wind energy target of 720 MW (Federal Government of the Netherlands and IPO, 2009) but it did not really come off the ground. Installed wind energy capacity (250 MW) roughly amounted to one third of the target. Most MWs were generated in the Rotterdam port area thanks to an earlier agreement (2009) between the municipality of Rotterdam and the Port Authority that promoted wind energy. Although both parties were willing to continue their pro-active policy, the province still had to mobilise land and facilitate development elsewhere.

At that time, location policy regarding wind energy consisted of the *Nota Wervelender* sectoral plan for wind energy. In comparison to the previous plan *Nota Wervel* (Province of South Holland, 2003), *Nota Wervelender* introduced a paradigm shift in planning. While *Nota Wervel* requirements emphasised land-use constraints on wind energy, *Nota Wervelender* was based on the opposite idea, namely that the adopted 2020 target needed some 'room' and positive criteria were necessary to define suitable land-use combinations. One important driver was the national wind energy goal:

> *In the beginning, South Holland developed wind energy in an 'ad hoc' way – through location studies that merely assessed spatial constraints, areas where wind energy is not possible. Only since wind energy has become a task of the national government has there been a regional approach to study the implementation possibilities.*
> (Expert 01, administration, 2016)

The *Nota Wervelender* sectoral plan sought to create coherence between wind energy growth and emerging policy goals in the fields of landscape, nature, and urban development. This was to be achieved through a spatial-geographic approach that would designate some land for wind energy (positive zones) as well as some land where this type of land-use would be prohibited (negative zoning). The spatial principles for this approach had been defined within the framework of the precursor strategy *Plaatsingsvisie Windenergie* (vision statement for wind energy sites).

> *The 'vision statement' starts from the notion 'where it can' rather than 'where it can't'. Where is it reasonable to go for wind? Are constraints absolute constraints or can we find alternative ways to deal with constraints?* (Expert 01, administration, 2016)

Under the sectoral plan, wind turbines should be sited according to four principles: (1) in places where there is wind; (2) in transition areas between different kinds of landscapes, in particular the coastlines; (3) in areas where energy demand is high, such as industrial areas; (4) next to large-scale transport infrastructure.

The resulting *Nota Wervelender* wind energy zones (*plaatsingsgebieden* or siting areas, see Fig. 14, p. 69) were areas adjacent to motorways and waterbodies in the

northern and southern parts of South Holland. Moreover, the Port of Rotterdam's industrial area was defined as a large-scale zone that would accommodate the largest part of South Holland's 2020 wind power generation facilities. In addition to 'siting areas', *Nota Wervelender* presented negative zones, so-called *vrijwaringsgebieden* (safeguarded areas) (Fig. 15, p. 70). Safeguarded areas were valued open landscapes such as agricultural land (polders) and main ecological assets in South Holland landscapes, such as waterbodies, nature reservoirs, and wildlife corridors.

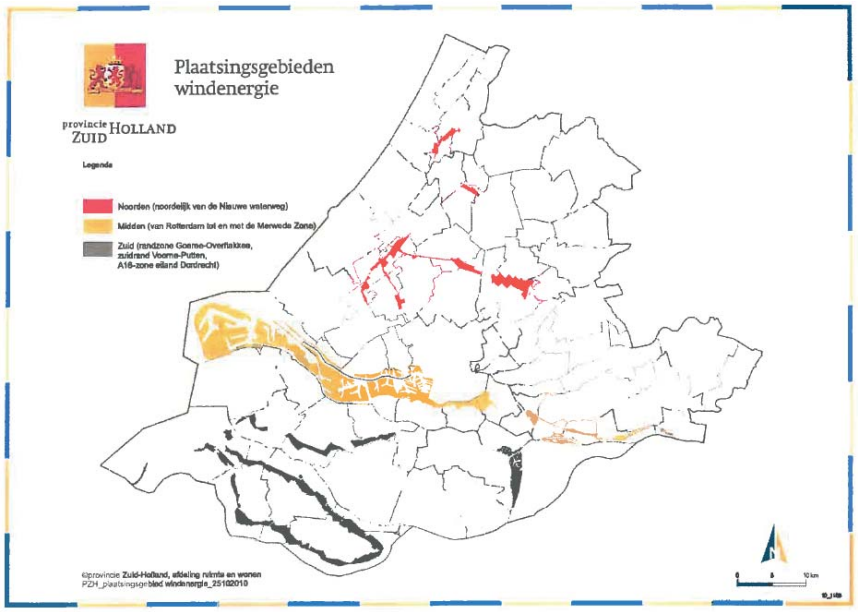


Figure 14. *Nota Wervelender* (2011): map of siting areas for wind energy
Source: Province of South Holland, 2011

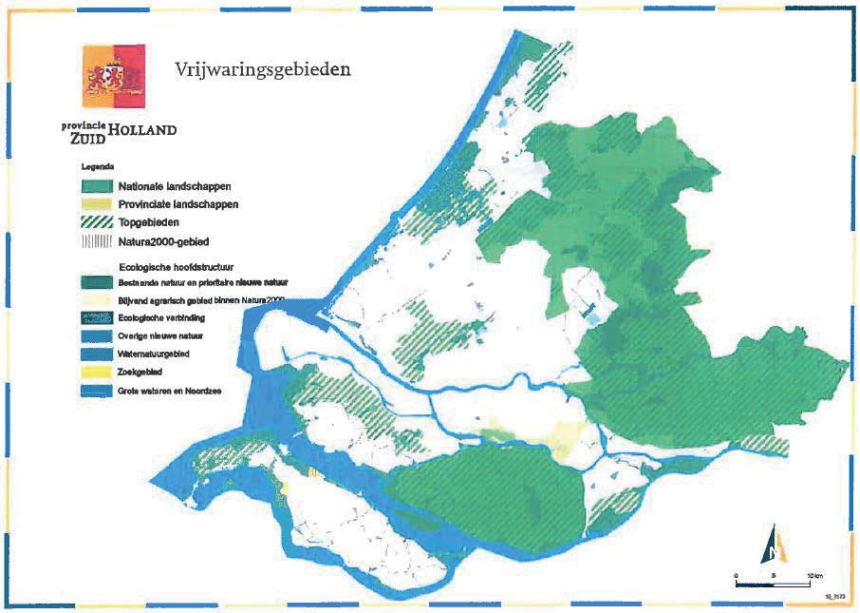


Figure 15. *Nota Wervelender* (2011): map of safeguarded areas with regard to wind energy
Source: Province of South Holland, 2011

3.1.2.2 Aggregated results of interviews: factors influencing South Holland's planning approach to wind energy

Having presented general developments in the energy and spatial policies of the Netherlands and South Holland, this subsection will introduce the reader to the specific rules-in-use that 'conditioned' spatial decisions in the opinions of interviewed parties. The findings are based on quotes from interviews with representatives of public authorities, mediators (consultants), and economic actors. Interview statements were compiled and classified into eleven principal factors, which are presented in Table 2 (p. 71).

Table 2. Factors influencing the South-Holland planning approach to wind power
Source: aggregated results of interviews

Factors influencing wind energy deployment in South Holland (before 2014)			Tendencies and events (after 2014)
Territorial	Biophysical attributes	Locations in highly urbanized areas with complex functional interdependencies but favourable land ownership conditions	none
	Rules and regulations	More than half of the provincial wind energy target is delegated to local authorities through wind energy covenants	One contractual partner has been abolished
		National authorities coordinate the approval procedure for wind energy projects of more than 100 MW	none
		Provinces are allowed to approve projects of 5-100 MW	none
		The minimum distance between wind turbines and other functions is variable. Noise emission thresholds and safety regulations exercise the greatest influence	none
Social	Community aspects	Large-scale development was put on hold until national authorities and provinces agreed on earmarking land for wind energy	Restrictions lifted after the earmarking of land for large-scale wind energy
		Lodging complaints against wind energy projects became common practice in the Rotterdam region	Residents affected by wind energy combined forces in a national interest group (NGO)
	Shared values	'Green Heart' planning doctrine[14]: preserving open landscape from urbanisation	implementation stalls, investigation zones in safeguarded areas
Economic	Market aspects	With exception of the Rotterdam port area there are few initiatives and little competition for available sites	Upcoming market initiatives in Goeree-Overflakkee
		Active parties mainly consist of Dutch medium-sized companies. There are few bottom-up initiatives	Global firms increasingly involved
	Rules and regulations	The subsidy system offers support when wind turbines are in operation. Operators have to compete for the lowest compensation	The subsidy system is beginning to exercise influence on the territorial distribution of wind energy

14 The concept of the planning doctrine was introduced by Faludi and van der Valk (1994; 1997).

This table leads us to make some general observations concerning the relevance of different types of influencing factors (e.g. rules, values, community aspects) and their tendencies to change over time.

The first observation relates to the influence of economic in comparison to territorial and social factors. Experts agreed that there was a weak market for wind energy in general and their overall impression was that developers were certainly not competing for sites. This is one aspect where South Holland decidedly differed from Lower Austria and East Flanders, where competition for sites between market players was strong.

A second observation concerns the tendency of some factors to change over time. The findings show that while territorial conditions were stable, social and economic conditions were not. This might be a consequence of the adopted planning approach (in 2014), but also of more autonomous events. Whether prevailing conditions had a positive (or negative) impact on wind energy deployment will be discussed later on in Section 3.1.5 (p. 95), which addresses the last sub-question of the case study analysis: the effectiveness of South Holland's planning approach.

Territorial factors

The chosen areas for wind energy were affected by complex functional interdependencies, e.g. flood safety, commercial and industrial use, traffic issues, or recreation. This had substantially increased the number of parties involved in wind energy development. Reconciliation with other land-use interests, e.g. allocating land for industrial expansion in the port area, was therefore generally difficult.

On the other hand, land ownership conditions had favoured development: most sites were owned and managed by public authorities. For instance, the Rotterdam Port Authority[15] could perform most land transactions in the port area, while areas close to motorways and waterbodies were usually managed by the Ministry for Infrastructure and the Environment.

Other important territorial factors concern procedural interdependencies between different levels of government, or more exactly, the division of power between national government and provinces in approving wind energy projects. As explained before, the Dutch government and provinces have the authority to overrule local land-use plans through *inpassingsplannen* (imposed land-use plans) if higher-tier interests are involved. Under the Dutch Crisis and Recovery Act (2010), this applies to project proposals of more than 5 MW capacity installed (or

15 The Rotterdam Port Authority is a public company owned by the City of Rotterdam and the Dutch Government.

two wind turbines), which may be authorized without the approval of the affected local authority.

In the opinion of experts, the application of this rule might be efficient in theory but in practice, it could substantially strain governance relations between national government, provinces, and municipalities. South Holland therefore sought to reach a consensus with affected local government bodies before approving any wind energy projects.

> *Wind parks of less than 5 MW fall within the competence of municipalities. Above 5 MW, it is the province; then we have the competence to deliver permits. But we actually want management to remain at the local level. Consequently, whenever possible, we conclude agreements with municipalities.* (Expert 06, administration, 2016)

The national authority – or ´*Het Rijk*´ – was equally reluctant to authorize large-scale wind energy projects top-down.

> *'To intervene' is, of course, a tough measure. It implies that other authorities are not capable of doing it. The national government should certainly avoid intervening and, as a first step, hand over management to the province, except when the province does not want to do that. This is why there is a coordination task involved.* (Expert 03, administration, 2016)

These two quotes show that the power to ´impose´ development is rather constrained in practice. In reality, public bodies at higher governance levels wished to pass spatial decisions down the line. The most important instrument for that purpose was to conclude a *windenergie convenant* (wind energy covenant) with local authorities and other important stakeholders.

In 2012, wind energy covenants that had come into effect resulted in a planned volume of 250 MW additional installed capacity in the Rotterdam region and harbour area. Thus the province had delegated more than half of the remaining wind energy task[16] to regional and local authorities.

Wind energy covenants are declarations of intention rather than binding agreements. They set the wind energy target (in MW) that should be met over a certain period of time in a specific area. They usually include a map of potential locations (see Fig. 16 and 17, p. 86). If implementation stalled despite the conclusion of a wind energy covenant, South Holland (or the national government) could still make use of its authority to allocate wind farms.

Social factors

In Dutch society, the rural (polder) landscape has a high, widely-shared value that has to be safeguarded from wind parks. Indeed, the rural landscape that has survived between highly-populated areas has been a metaphor for well-being ever since the 1950s. The spatial planning doctrine of the Green Heart (Faludi and van

16 The value relates to an installed wind energy capacity of 250 MW in 2009. The 2020 target adopted by South Holland was 720 MW (until 2014).

der Valk, 1997, p. 58) describes the open, green area surrounded by the cities, towns and villages of the Dutch *Randstad* in the Western part of the Netherlands. Interviewees observed that there was a consensus among planners that the remaining green areas of South Holland, which largely consisted of agricultural land, should be protected from any development. Industrial and infrastructural areas (e.g. sites next to transport links) were considered most suitable for large-scale wind energy production.

Another important factor was that local acceptance of wind farms, according to interviewed experts, had declined rapidly during the previous years. Higher-tier political objectives for green energy had altogether little relevance at local level (cf. Breukers and Wolsink 2007, p. 2748). By 2012, lodging complaints against wind energy projects had become common practice and in 2013, a national NGO was founded to give residents affected by wind energy schemes a voice in wind energy decisions taken at a higher governance level. While South Holland thus took up a pro-active, supportive role and committed itself to ambitious wind energy goals, these goals increasingly clashed with the interests of local residents. This also had an impact on planning practices in the wind energy sector. While previously plans for wind energy had been developed in 'sheltered arrangements', they suddenly became a topic of public discussion.

> *About four-five years ago, people became increasingly worried and founded some associations. We therefore got increasingly confronted with people who felt that they had no say. As a result, the planning of some projects lasted up to ten years, simply because you had to re-design plans again and again ... and then we thought that we'd really have to make this more efficient.* (Expert 18, economy, 2016)

Economic factors

Until 2014, there was certainly no run on wind energy locations. Interviewed experts declared that, except for the Rotterdam port area, there were few initiatives and little competition for available sites. Wind energy deployment stagnated in South Holland, just as in the rest of the Netherlands. During the period 2009-2012, countrywide capacity installed increased by 200 MW (CBS, 2017). In the years before, the same increase had been achieved per annum.

One reason was that the SDE/SDE+ national incentive programme[17] did not always provide stable conditions for investment. Around 2012, it became increasingly

17 The national programmes SDE and SDE+ compensated the gap between payback tariff (of project investment) and market price (for selling renewable electricity). SDE stands for Subsidie Duurzame Energie (sustainable energy subsidy). The SDE incentive programme was too expensive. Its successor, the SDE+ programme, did not prioritise any technology but supported the cheapest form of renewable energy first. The compensation tariff was defined by a procedure of competitive bidding between project applicants for the lowest subsidy. As wind energy was not necessarily the cheapest option, it became more difficult to get subsidies.

difficult to get the SDE allowance as wind energy operators had to compete for the lowest subsidy (De Boer 2013). On the other hand, as the following quote indicates, the lack of coordination between national and provincial policies led project developers to shrink back from taking the risk of high investment costs.

> Finally, the lack of harmonization of national and regional policies affects growth. This can result, for example, in difficulties in obtaining SDE+ benefits. SDE+ applications can only be submitted after regional permissions, such as environmental permission and construction permits, have been obtained. (De Boer, 2013, p. 127)

This document quote confirms interview statements that viewed the country´s subsidy scheme as a minor factor as regards low growth rates. In the opinion of experts, a much more important factor was that, around 2012, negotiations about land allocations to wind energy had stalled between national government and provinces.

It is, however, important to keep in mind that Dutch subsidy regulations were frequently modified. For instance, after 2014 the incentive programme classified all Dutch municipalities into different wind speed categories with a (maximum) compensation per category; and this started to exercise greater influence on the territorial spread of project applications, the interviewed experts concluded.

3.1.3 Planning arena

When wind energy became a concern of the national government, the Dutch provinces agreed to earmark land for large-scale developments (more than 100 MW installed capacity). This would guarantee the provision of enough land to meet (most of) the national wind energy target. This set-aside land, or zoned areas, would then be introduced into the SvWOL national structure plan for onshore wind energy.

At the time when South Holland promised to earmark land, the main responsibilities for wind energy planning had already been transferred to regional and local authorities. As described in the previous section, a large part of the provincial implementation target was outsourced by means of wind energy covenants. The process of providing land for national purposes therefore turned out to be a process of negotiation rather than a spatial-geographic exercise of identifying suitable locations.

The next subsections will address the interaction between different actors in the ‘South Holland wind energy arena’ and describe transactions that influenced the outcome or, using the terminology of this thesis, the ‘planning approach to wind energy’. In the South Holland case, planning decisions were divided over three levels of policy-making: the national level, the South Holland (provincial) level, and the local level. The South Holland arena therefore comprised three (sub)arenas: the conclusion of covenants at the local level, the review of provincial location and

implementation policy and, simultaneously, the search for zoned areas for large-scale (national concern) developments.

3.1.3.1 Aggregated results of interviews: participants in the South Holland planning arena

The following pages will summarize the results of interviews about the actors who participated in decision-making as part of the South Holland planning approach.

Table 3 below provides a comprehensive list of parties who participated in the South Holland planning arena according to expert information and document analysis. The organisations have been categorized into 'core' and 'shell' actors and into 'planning' (yellow cells) and 'implementation' actors.

Table 3. Planning and implementation actors in South Holland, 2012-2014
Source: aggregated results of interviews

organisation	position				policy document					
	actor level	Spatial-organisational level	planning	implementation	Covenant of port of Rotterdam	Nota Wervelender	Covenant of Rotterdam City	SvWOL	VRM	Covenant of Goeree-Overflakkee
Ministry for Economic Affairs	AD	macro	x					x		
Ministry for Infrastructure and the	AD	macro	x					x		
IPO Interprovinciaal Overleg	AD	macro	x					x		
VNG Association of Netherlands	AD	macro	x					x		
Ministry of Defence	AD	macro	x	x				x		
Directorate-General for Public Works and	AD	macro	x	x				x		
Ministry of Education, Culture and Science	AD	macro	x					x		
House of Representatives	PO	macro		x						

organisation	position				policy document					
	actor level	Spatial-organisational level	planning	implementation	Covenant of port of Rotterdam	Nota Wervelender	Covenant of Rotterdam City	SvWOL	VRM	Covenant of Goeree-Overflakkee
NWEA The Netherlands Wind	EC	macro	x	x		x		x	x	
Netherlands Commission for	IM	macro	x					x		
Spatial planning consultancy	IM	macro	x		x			x		
Nature and environment	IM	macro	x					x	x	
Landscape architecture	IM	macro	x			x		x		
Recreational organisations	IM	macro	x					x		
NLVOW Community organisation against wind energy	CI	macro		x						
Province of South Holland –Departments Spatial Planning and the Environment	AD	meso	x		x	x	x	x	x	x
Council of South Holland	PO	meso		x						
Rotterdam City Region (abolished in 2015)	AD	micro	x				x			
Municipality of Goeree-Overflakkee	AD	micro	x							x
Municipality of Rotterdam	AD	micro	x		x		x			

organisation	position				policy document					
	actor level	Spatial-organisational level	planning	implementation	Covenant of port of Rotterdam	Nota Wervelender	Covenant of Rotterdam City	SvWOL	VRM	Covenant of Goeree-Overflakkee
Alliance Sustainability Regional Municipalities (since 2015)	AD	micro	x							
Local authorities (municipal councils)	PO	micro		x						
Port of Rotterdam Authority	EC	micro	x	x	x		x			
Active wind energy developers	EC	micro		x				x		
Industrial firms located in the harbour	EC	micro		x						
Local residents affected by wind energy in the Rotterdam region	CI	micro		x						

Legend:
Planning core actor

Acronyms:
AD administration,
CI civil society
EC economy
IM intermediary
PO politics

The findings show that actors at different levels and within several divisions of government as well as various local implementation actors were involved in the planning process. The predominance of planning actors at the national level is particularly striking. On the one hand, this mirrors the initial task of central government, which was to achieve the vertical coordination of national and provincial interests; on the other hand, it provides insights into the still highly

institutionalized system of Dutch planning at the national level (see Section 3.1.2.1, p. 65).

Alongside public administration officials and professionals who occupied an intermediary position (mostly consultants), several organisations representing economic interests were involved, such as the Port of Rotterdam Authority and The Netherlands Wind Energy Association (NWEA). In addition, some actors literally formed the core of the arena while others were involved to a lesser extent. Furthermore, several organisations were both 'planning' and 'implementing' actors, which means that they were involved in planning decisions and, at the same time, participated in local-level wind energy development.

In order to understand the negotiating stance of parties involved in the South Holland wind energy arena, it is necessary to detect the motives and competences that drove the ways in which parties interacted. The next text passages will be dedicated to this topic. Attention will then be paid to the generation of knowledge that supported decision-making during the planning phase of national and provincial wind power policies. The section concludes with a graphical interpretation (p. 88) of the actors' positions and interactions within the South Holland planning arena.

3.1.3.2 Actors and their positions

National authorities

At the national level, planning authority for wind energy has been divided over two ministries, with the Ministry for Economic Affairs being responsible for the implementation of the national wind energy target. In this position, it has facilitated periodic energy agreements between various governmental levels and other key stakeholders. One important agreement in this context was the Dutch Energy Agreement (2013). The Ministry for Infrastructure and the Environment, in turn, has had to facilitate a coordinated approach to the spatial planning of large-scale wind energy generation. The two ministries thus shared the authority to implement wind parks at a strategic level, but their opinions clashed when considering how this authority should be applied in practice:

> *At the national level, a discussion took place between two ministries: the Ministry for Economic Affairs wanted to allow the market a lot of freedom. Why, then, should it be necessary to determine exactly where these things had to be? On the other hand, there was the Ministry for Infrastructure and Environment, which stood for spatial quality. Large-scale wind parks are a national concern, and therefore, the Ministry for Infrastructure and Environment asked for a specific spatial framework.* (Expert 03, administration, 2016)

This discussion revealed an interesting power play between the two ministries. The Ministry for Infrastructure and the Environment argued that clear spatial principles were necessary to approve (or reject) project applications for large-scale

developments. The Ministry for Economic Affairs, on the other hand, was more concerned about market freedom.

Another bone of contention concerned what exactly was meant by 'large-scale development'. It had to be a coherent spatial development that would add up to 100 MW. However, several wind energy initiatives could be involved in a single development. Still, the threshold of 100 MW left room for interpretation about who would be responsible for which kind of development.

> *The national government says: more than 100 MW is 'for us'. And then it also depends on the definition of 'wind park'. The entire Rotterdam port area has several wind parks. In fact, there are not so many national projects at all.* (Expert 01, administration, 2016)

> Is the wind energy covenant of the Rotterdam port zone considered to be a 'large-scale wind park' by the national government? *Yes, possibly. Because a written agreement exists between the parties. If implementation does not go well, the national government is legally competent to intervene in this area.* (Expert 03, administration, 2016)

Interprovincial Association

The collective interests of the Dutch provinces are represented by the Interprovincial Association (IPO). IPO maintains close contact with the Dutch government, national authorities, and non-profit organisations; it plays an informative and guiding role during the formal policy preparation process. In this position, IPO guided the negotiation process with the Ministry for Economic Affairs and the Ministry for Infrastructure and the Environment about large-scale wind project implementation on provincial territories.

The task of IPO was to represent provincial interests within the context of two interlinked agreements with the national government. These agreements concerned the adoption of provincial wind energy targets (intended implementation) and earmarked land (intended locations). The latter concerned the preferred areas on which wind energy projects should be implemented from a provincial perspective. The former related to the intended contribution of each province to the national wind energy target. One topic of discussion was the time span during which the provinces had to implement large-scale wind projects.

> *The provinces kept temporising about the finalisation of their plans. Couldn't it be moved to 2018? But the national government wanted to be on the safe side. It wanted to have all wind energy areas designated by 2016, so that a sufficient number of projects could be realised by 2020.* (Expert 03, administration, 2016)

Another IPO task concerned the alignment of provincial location policies for wind energy. As described in the previous section, these were highly different. While South Holland and several other provinces had already zoned wind energy, other provinces had to start from scratch. This means that these varied positions and plans had to be streamlined before proposing locations for large-scale wind parks to the national government.

South Holland authorities

Among South Holland authorities, the departments of spatial planning and the department had a decisive influence on wind energy development. In the case of wind energy, they represented the interests of landscape conservation and renewable energy.

The province of South Holland had to suggest areas for large-scale wind parks to the national government. These earmarked land areas were strongly linked to the outcome of negotiations between the national government and IPO on 'capacity distribution targets'. This again involved the risk of an increased 2020 provincial wind energy target (which until then had been an installed capacity of 720 MW).

Another issue was integrating hitherto operational wind energy zones of the *Nota Wervelender* into national policy. After all, South Holland had been mired in former agreements, which made location changes difficult. It was necessary to trade off existing plans and local initiatives against national priorities. Thus, the adoption of a new spatial policy offered a chance to transfer as much of the burden of public resistance as possible to the national government.

> *100 MW apparently could not be made to fit into the smaller zones. Thus we did not integrate them into the National Policy. I had the impression that the province of South Holland would have been glad if the national government had taken them over, for in this case the position of the province towards affected residents would have been far more comfortable.* (Expert 03, administration, 2016)

The Netherlands Wind Energy Association

The Netherlands Wind Energy Association (NWEA) was founded in 2005 and subsequently acquired a strong position as a representative of the interests of the wind energy sector. The organisation lobbies the Dutch government on behalf of the whole sector: manufacturers, developers, operators, and consultants. A general aim is to exert influence on national and regional policy-making. This is usually done by submitting viewpoints during participation procedures but also by carrying out consultant work for planning authorities. NWEA had previously advised South Holland concerning location choices presented in the *Nota Wervelender*.

By 2012, when the planning process for national and provincial earmarked land had started, NWEA had to fight on several front lines. Increasing local opposition considerably weakened the willingness of local authorities to implement wind projects.

> *Residents living near wind turbines were the first who got organised. At that time, we were not very much inclined to do something about it. But when the smoke signals were received by local government we were told: `but you had not communicated your plans to the neighbourhood´. This was the point when we realised that we were very vulnerable.* (Expert 18, economy, 2016)

On the other hand, the commitment of national authorities to authorizing large-scale developments in a top-down manner was not strong either. In this unfavourable context, NWEA lobbied for capacity agreements on how to distribute the national wind energy target across provincial territories and for concentrated development. The idea was that concentration, instead of dispersion, would allow more large-scale wind parks, to which the national fast-lane approval procedure could be applied. In the case of South Holland, the association refrained from interfering because the province had already adopted ambitious energy targets.

Affected municipalities: Rotterdam and local authorities in the Rotterdam region

Affected municipalities were local authorities that were directly involved in wind energy policy implementation. There were, however, two types of involvement, depending on whether a municipality had earmarked land on its territory, or whether it had to deal with nearby wind power projects on the territory of a neighbouring municipality. The first type of municipality were given the option to sign covenants with the provincial government in order to gain more power in land-use decisions concerning wind energy. The scope of action of the second type was generally reduced to influencing plans by lodging complaints.

The municipality of Rotterdam belonged to the first category. The municipality agreed to two wind energy covenants: the covenant Port of Rotterdam (2009) and the covenant Rotterdam City Region (2012). This meant that Rotterdam had to deal simultaneously with two capacity growth agreements and with two sets of contractual partners.

The implementation of the 2009 agreement was mainly in the hands of the Port Authority. The 2012 agreement was a more complex arrangement, enabling the combined efforts of fifteen municipalities to coordinate wind energy development. In the context of the City Region covenant, the position of Rotterdam varied for every project, depending on whether land for development was in hands of the city or not. It comprised the organisation of the dialogue with the local residents and/or coming to an agreement with wind energy operators on, for instance, local participation and reinvestment.

Port of Rotterdam Authority

The Port of Rotterdam Authority acted as an intermediary between public authorities and private actors. The company is owned by the municipality of Rotterdam and the Dutch government but operates, at least where wind energy deployment is concerned, highly independently.

The covenant of 2009 launched a considerable expansion in wind energy infrastructure. In addition, the long-term development strategy of the Rotterdam Port – the 'Port Vision 2030' (2011) – defined targets for renewable energy. The

objectives of these two policy documents were slightly different: the covenant aimed to install 150 MW additional capacity by 2020, but did not set a total amount of MWs installed. This would include wind energy projects that were already in existence before the agreement. The Port Vision, instead, formulated an overall goal of 300 MW capacity installed by 2020 (Rotterdam Port Authority, 2017).

One main task of the Port Authority is to lobby for the interests of industrial firms based in the port area. This includes preserving transport access and safety. For instance, wind turbines might damage (underground) infrastructure, disturb radar controllers or impair the value of land for industrial purposes. Other risks, however, go beyond the borders of the Rotterdam harbour. This involves keeping in good terms with neighbouring municipalities.

> *I sometimes say: the Port Authority is the 'stage director' of the area. Of course, the primary focus is on the port area and its businesses, the interests of the port. Our first concern is to combine these interests. And then, we are also aware that we have a responsibility towards the surrounding area. We really want to have a good relationship with the neighbouring municipalities. This again is necessary to keep developing the port. (Expert 19, economy, 2016)*

Port interests can be pushed through in allocation of land, when the Authority carries out the land transaction for a wind energy project. As most of the land is in public hands and managed by the Port Authority, the latter can essentially set the terms that a future developer has to cope with. Land is thus offered under the pretext of favourable conditions for the port.

Consultants

Selected consultants played a key role in the South Holland planning arena because they provided expertise that shaped, or even directed, planning choices. In this regard, it is important to keep in mind that these were consultants from various fields of expertise, and that long before, several had been involved in decisions for the *Nota Wervelender* plan. The primary role of consultants was to investigate the possible drawbacks of specific planning options, thereby assisting national and provincial authorities in the decision-making process.

The organisations involved were closely associated with the authorities and ranged from advisory boards and NGOs to private companies. According to the persons interviewed, within this diverse group of consultants three groups were particularly important:

- consultants from the wind energy sector (market-oriented);
- consultants in the field of landscape planning (qualitative aspects of landscape); and,
- consultants in the fields of spatial and energy planning (energy calculations and spatial-technical constraints).

Nature and environmental organisations, on the other hand, were hardly mentioned by experts. This is indeed rather curious but says something about the knowledge that, at that time, was considered incomplete. The main emphasis in the improvement of knowledge lay on landscape-related qualitative aspects and on achieving 'a high enough MW output'. In particular, it was deemed essential to arrange wind turbines in the strongest synergy with landscape features.

3.1.3.3 Interactions between actors

The planning phase took place, as mentioned before, from 2012 to 2014. Previous actions and decisions that had been taken in connection with the *Nota Wervelender* policy were interlinked with this process. This means that the South Holland planning arena stretched not only across three levels of policy-making (from national to local) but also across two phases of planning.

Decision-making at national level

At national level, a task group (*kernteam*) was set up, with representatives of both ministries. The task group steered the spatial planning coordination process between Dutch provinces (represented by IPO), municipalities (represented by VNG) and national authorities.

> *We had a task group with representatives of both parties. The Ministry for Infrastructure and Environment constantly involved the Ministry of Economic Affairs. […] The task group consisted of six to ten professionals from the two ministries, from fields of expertise that were relevant for wind energy: landscape architects, legal experts, … . Around these people, we organised a kind of 'shell' that consisted of even more experts.*
> (Expert 03, administration, 2016)

The 'shell' refers to communication and transactions with a wider group of professionals that supported the task group with their knowledge and advice. There were two categories of involved parties:

- an advisory board that consisted of professionals from different sectors of government;
- a feedback group that consisted of economic and community organisations: recreational associations, nature and environmental agencies, the NWEA wind energy association, and selected wind energy operators.

Knowledge was exchanged between the task group and the actors named above in a semi-structured process of individual and collective meetings.

Decision-making at provincial level

In contrast to the wide-ranging group of actors involved in planning decisions at the national level, a comprehensive discussion was avoided in the province of

South Holland. Provincial actors combined their efforts to introduce the siting areas of the *Nota Wervelender* policy into the new provincial Structure Plan. The purpose behind this was to make as few changes as possible. It is therefore necessary to pay some attention to the planning of *Nota Wervelender,* which took place during 2009-2010 in a comparatively confined setting.

> *The development of the ´vision statement for wind energy sites´ was an internal process inside the department of Spatial Planning and Environment. We consulted the provincial adviser for spatial planning. A wind energy firm was involved and we commissioned a number of firms to carry out detailed studies.* (Expert 01, administration, 2016)

Eventually, *Nota Wervelender* land-use decisions were largely integrated in the intended Structure Plan of the national government and provincial authority.

Creation of knowledge

According to interviewed experts, South Holland adopted the *Nota Wervelender* siting areas without screening the locations through a Strategic Environmental Assessment (SEA). The province opted to skip this procedure because it was not necessary from a legal point of view. The choice of locations was therefore based on an assessment study for the Rotterdam Port area and (in other areas) various consultant studies. Consultant work, according to interviewees, concentrated on landscape impacts, thus assessing locations mainly from a spatial-qualitative point of view and not so much from a technical/environmental point of view.

> *Some landscape offices conducted research that explored possible zones for wind energy and coupled these to an indicatory amount of MW. In fact, they were taken up in the provincial Structure Plan, by location and sometimes by region. Then you arrived at as much as 800 MW, whereas our ambition was 735.5 MW. This actually means that it was taken into account at an early stage that some locations might drop out.* (Expert 06, administration, 2016)

The Port of Rotterdam Authority and the NWEA held a different opinion: energy calculations were too optimistic and they argued for extra space.

> *During the creation of the regional wind energy pact we had already said: 'what you have noted down is far too optimistic, it is not possible.' They took no notice of us. Because — you see that happening again and again — one wants to write down the fantastic targets that will be achieved by wind energy, even though they are not based on realistic assumptions.* (Expert 19, economy, 2016)

The next map (Fig. 16, p. 86) shows the potential locations for wind parks (marked in green and orange) according to the port covenant analysis. The locations were part of the agreement, though taking into account 'technical and political considerations'.

A comparable, though less detailed, map of potential locations was adopted in the covenant for the Rotterdam City Region (Fig. 17, p. 86). The capacities in MWs per location were estimated by these authorities and added up to, in total, 180 MW.

Figure 16. Location analysis concerning wind energy in the Rotterdam port area
Source: Bosch et al., 2009

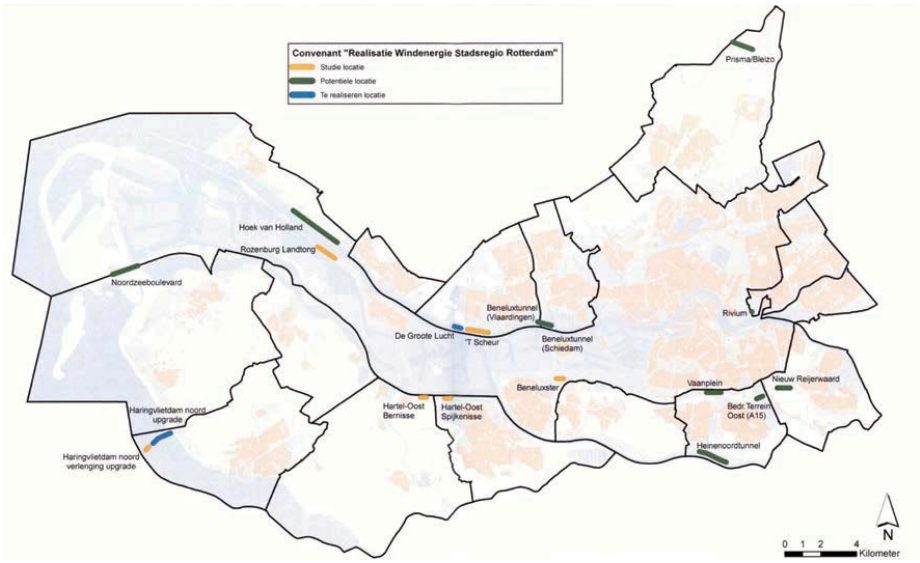


Figure 17. Potential locations for wind energy in the Rotterdam city region
Source: covenant wind energy Rotterdam City Region, 2012

A combined technical assessment of the city region's locations did not take place. The locations were too small to accommodate national (large-scale) wind energy developments and therefore fell under provincial planning authority. Still, the expected wind energy capacities of locations in the city region were counted among South Holland's 'contribution' to the national wind energy target of 6000 MW.

In contrast to *Nota Wervelender* zones, the intended wind energy zones in the SvWOL were subjected to a Strategic Environmental Assessment. Their wind energy potential was examined by a technical advisory company possessing specialized knowledge on the environmental impact analysis of wind parks. These fairly technocratic studies eventually indicated a specific number of MWs per location. In addition, since some locations could possibly affect flood protection measures, authorities in charge of water systems gave advice on how to treat wind energy infrastructure within flood defence areas (Dutch Ministry for Infrastructure and the Environment and Dutch Ministry for Economic Affairs, 2014).

3.1.3.4 Map of the South Holland planning arena

We end this section on the Planning arena with an actor map of the constellation of participants (Fig. 18, p. 88). This summarizes the information presented in previous subsections and shows the positions of planning and implementation actors according to the five relevant actor dimensions and three spatial-organisational levels. Connecting lines between different actors symbolize interactions between them.

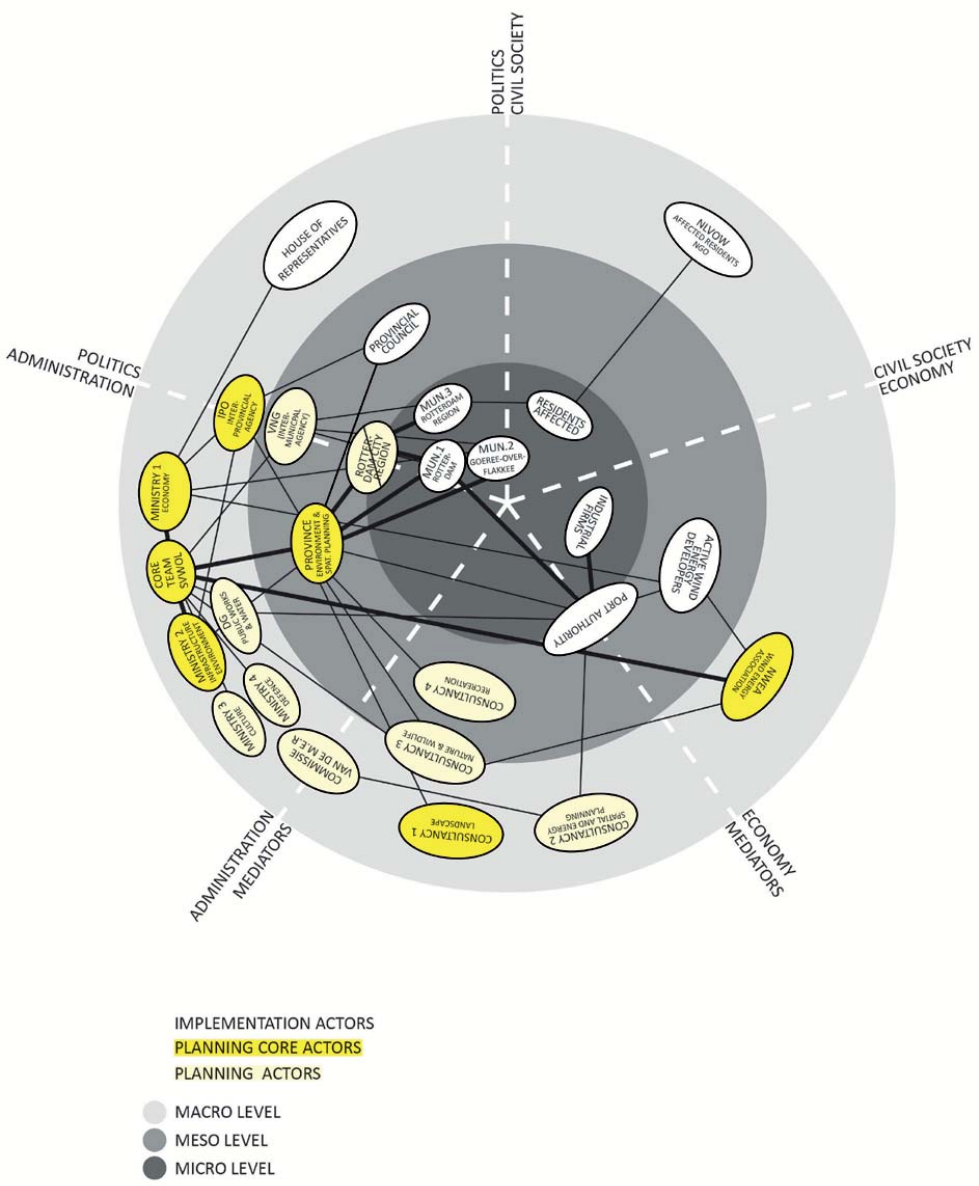


Figure 18. Actor map of the South Holland planning arena, positions and interactions of participants
The black lines relate to the intensity of interactions between different participants.
Figure by the author

The figure shows that a striking number of national-level actors actively participated in the South Holland planning process. This mirrors the planning task of interweaving national and provincial interests into land earmarked for large-scale wind energy development. Furthermore, we can single out several parties, who organised the reconciliation of interests between planning and implementing actors, between different levels of government (vertical coordination), and between the sectoral goals pursued by energy and spatial planning authorities (horizontal coordination). These were:

- at national level, the task group with experts of the Ministry for Economic Affairs and the Ministry for Infrastructure and the Environment. The group also facilitated the exchange of knowledge between the association of Dutch provinces (IPO), the association of Dutch municipalities (VNG), important implementation actors, and national-level advisory boards;
- at provincial level, the South Holland planning department held a key position between national actors, wind energy covenant partners, and municipalities affected by planned wind parks;
- at regional level, the Port of Rotterdam Authority and the Rotterdam City Region mediated between provincial and local interests. The Port Authority connected economic and administrative actors, and worked in close contact with industrial firms located in the harbour. The city region, for its part, acted as an agent for political and administrative actors from Rotterdam and its regional municipalities.

3.1.4 Planning approach

The main components of the South Holland planning agenda for wind energy were formalized by three policies. These were (in chronological order): the national-level stipulations in the Energy Agreement (*Energieakkord*, 2013) and the Structure Plan for Onshore Wind Energy *(SvWOL* or *Structuurvisie Wind Op Land, 2014)* and, one level below, the implementation rules of the provincial Structure Plan (*VRM* or *Visie Ruimte en Mobiliteit*, 2014). These plans and agreements formally confirmed the intention of South Holland to strive for the implementation of the national wind energy target on earmarked land.

Table 4 (p. 90) presents the components, or planning decisions,[18] of these plans in greater detail. In keeping with our theoretical framework, the table differentiates between the *spatial strategy* (rules governing location choice) and the *implementation strategy* (rules governing implementation). For example, an agreed wind energy target or preferred land-use mixes were stipulated in the spatial strategy. Requirements that belong to the implementation strategy centre

18 Stipulations do not necessarily have to be new. In fact, the South Holland planning approach includes 'unchanged' (conditional) rules and regulations.

on practices that would support wind energy initiatives and enhance public support.

Furthermore, attention is paid to the planning *options* that were considered during the decision-making process. For analytical purposes, it is indicated whether these options relate to economic (E), territorial (T), social (S) or governance issues (G). This will help later on to summarize the priorities of the planning approach in each case study. Section 4.2.2.3 (p. 203), where the main findings of the three cases will be summarized, will reflect on the total set of available options for all case studies.

Table 4. South Holland planning approach to wind power 2014: planning decisions and levels of policy making

Spatial-organisational level		options available	planning decisions	formalized in
MACRO national level	spatial strategy	E1. Land earmarked for energy targets: general aim vs zone-specific targets	2970 MW distributed over 11 areas for large-scale wind energy in the provinces of Groningen, Drenthe, South Holland, Zeeland, Flevoland Friesland and North Holland	SvWOL (2014)
		E2. Size of zones: minimum / maximum	zones have to be large enough for wind energy initiatives of more than 100 MW	SvWOL (2014)
		T1. Concentrated / dispersed development	concentrated, large-scale developments to reduce impacts on landscape	SvWOL (2014)
		T2. Types of zones: positive / negative / neutral	positive zones: 'areas for large-scale wind energy' (Gebieden voor Grootschalige Windenergie)	SvWOL (2014)
		S1. Generic rules vs spatial-geographic approach	spatial-geographic approach: windy areas and on 'large-scale, cultivated landscapes'	SvWOL (2014)
		S2. Land use: constraints / combinations	combination with port and industrial areas, large-scale water engineering works (embankments), transport infrastructure and polder landscapes	SvWOL (2014)
		S3. With/without guidelines for the set-up of wind turbines	connection to landscape, distinctive set-up of turbines, long separation distances between wind parks	SvWOL (2014)
	Implementation strategy	G1. Upscaling / downscaling level of decision-making	> 100 MW: national planning authority 5-100 MW: provincial planning authority < 5MW: local planning authority	Electricity Act of 1998 / Crisis and Recovery Act of 2010
		G2. Local participation and compensation	non-committal: 'Wind energy initiatives have to investigate local interests'	SvWOL (2014)

Spatial-organisational level		options available	planning decisions	formalized in
MESO provincial level	spatial strategy	E1. Land earmarked for energy targets: general aim vs zone-specific targets	735.5 MW distributed over larger and smaller wind energy areas	VRM (2014)
		T1. Concentrated / dispersed development	concentrated siting of wind turbines, avoiding dispersed development	VRM (2014)
		T2. Types of zones: positive / negative / other	positive zones: 'locations for wind energy'	VRM (2014)
		S1. Generic rules vs spatial-geographic approach	spatial-geographic approach: on windy areas and in correlation with main landscape characteristics	VRM (2014)
		S2. Land use constraints / combinations	combination with transport and flood protection infrastructure, large-scale industry and large-scale borderlines between land and water	VRM (2014)
		S2. Land use constraints / combinations	wind power is not allowed on valued cultural, natural, or recreational landscapes	VRM (2014)
		S3. Guidelines for the set-up of wind turbines	wind turbines in single straight lines or in clusters; parallel to transport infrastructure and borderlines	VRM (2014)
	implementation strategy	G1. Upscaling / downscaling level of decision-making	pacts/agreements with local authorities. Province will approve wind energy projects in case local authorities do not cooperate	VRM (2014)
		G2. Participation and area development	non-committal: wind energy developers should provide for a participation plan and 'environmental management'	VRM (2014)
MICRO municipal / intermunicipal level	spatial strategy	E1. Claiming land for energy targets	Goeree-Overflakkee (260 MW), Port of Rotterdam (283-300 MW), Rotterdam City Region (150 MW) and various smaller locations that can accommodate 5-30 MW	SvWOL (2014) / VRM (2014)
		S1. Generic rules vs spatial-geographic approach	coordinated plans for the Rotterdam port area ('locations for wind energy') and the Rotterdam City Region ('study locations', 'potential locations', 'to be realised locations')	Covenant Rotterdam Port, 2009 / Covenant Rotterdam City Region, 2012

The table presents compulsory planning requirements at all three spatial-organisational levels (macro, meso, and micro), whereby decisions at macro level clearly dominate. Zoned areas for wind energy were enacted at every level: national areas for large-scale development (SvWOL zones) overrule provincial zones for wind energy (VRM areas) which, in turn, overrule municipal and intermunicipal plans.

One characteristic of the planning approach is that it contained fairly specific compulsory requirements concerning the economic task of earmarking enough land to achieve wind energy targets. Capacity growth agreements that would guarantee the promotion of the 2020 wind energy target were concluded in a top-down manner; the national target was divided into provincial targets and these, in turn, were subdivided into local targets for selected areas.

In contrast, compulsory planning requirements related to implementation, in particular the issue of local participation and compensation, were rather non-committal. More attention was paid to creating commitment within local government to a timely implementation of zones for wind energy generation. Top-down approval of wind turbines needed to be avoided. The VRM explicitly stated that the province preferred to transfer approval competences to local authorities.

3.1.4.1 Spatial strategy: preserving open green landscapes by bundling wind parks and other infrastructure

The VRM spatial strategy allocating wind energy projects is chiefly composed of earlier decisions published in *Nota Wervelender*. The siting areas that had been adopted then were, in essence, re-adopted as VRM wind energy zones. Strategic land-use choices pursued the territorial goal of concentrating wind park sites on, or in close vicinity to, industrial and transport infrastructures.

However, one main difference with the previous policy was that the VRM constituted a comprehensive scheme for various kinds of spatial developments, whereas the *Nota Wervelender,* like the SvWOL, dealt with wind energy alone. In consequence, the forty pages of *Nota Wervelender* were reduced to two brief sections on ‘wind energy’ in the VRM. Thereby, although it adopted practically the same locations, the VRM neglected the wider spatial framework of *Nota Wervelender*, its social considerations of landscape aesthetics and terms for protection, and its safeguards for negative zones. As a result, former ‘safeguarded areas’ became part of the undefined area outside of VRM zones for wind energy. Although wind energy developments on formerly safeguarded areas were thereby still prohibited, the VRM was based on merely one side of the landscape narrative: the limited logics of ‘where can it go’ instead of the approach combining positive and negative land-use criteria.

> *The exclusion principles (…) are actually still part of the provincial Structure Plan, but the framing, or wording, is different. The positive zones were more or less taken over, but the negative part, the safeguarded areas, was left out.* (Expert 06, administration, 2016)

In addition to the decision to reduce *Nota Wervelender* earmarked land to positive zones, the VRM contained compulsory planning requirements to build wind turbines in such a way that they would improve the visual experience of landscapes. Both VRM and SvWOL paid particular attention to the social concern of 'landscape scenery' and stipulated setting up wind turbines in an orderly, compact way and at a respectable distance from the next development.

> Considering the dimensions and scale of the latest generation of wind turbines, other elements in the landscape, such as tree-lined avenues, villages, and even rivers, seem to shrink beside a large-scale wind park. It is therefore essential – as suggested by Feddes, the national landscape adviser – to achieve intelligibility by arranging the park in such a way that it connects to a spatial pattern involving a larger scale. An additional factor that strongly influences the perception of an energy landscape is the internal positioning of wind turbines and the distance between wind parks.
> (Dutch Ministry for Infrastructure and the Environment and Dutch Ministry for Economic Affairs, 2014, p.28)

From an economic point of view, a main goal was to obtain a sufficient amount of land for wind energy. The Dutch Energy Agreement had set a target of 735.5 MW by 2020 on South Holland territory, which was slightly more than the previous target (720 MW). Nevertheless, as confirmed in the interview quote below, VRM land requirements for wind energy were altogether less expansive than the former siting areas.

> *Changes after the VRM were marginal. It was not an important topic during the planning process for the Structure Plan, but it had been a lot more important for the old vision.* (Expert 01, administration, 2016)

Most of the provincial target was to be achieved in two zoned areas: the Port of Rotterdam and the island municipality of Goeree-Overflakkee. The SvWOL designated these territories as 'zones for large-scale wind energy development' (Fig. 20). Together, the two (SVWOL) zones would guarantee about two thirds (525 MW) of the provincial target. The remaining energy target (201.5 MW) would be allocated to smaller zoned areas distributed over South Holland. Many of these zones lay in the southern part of the province, in the surroundings of the municipalities of Rotterdam and Dordrecht (Fig. 19).

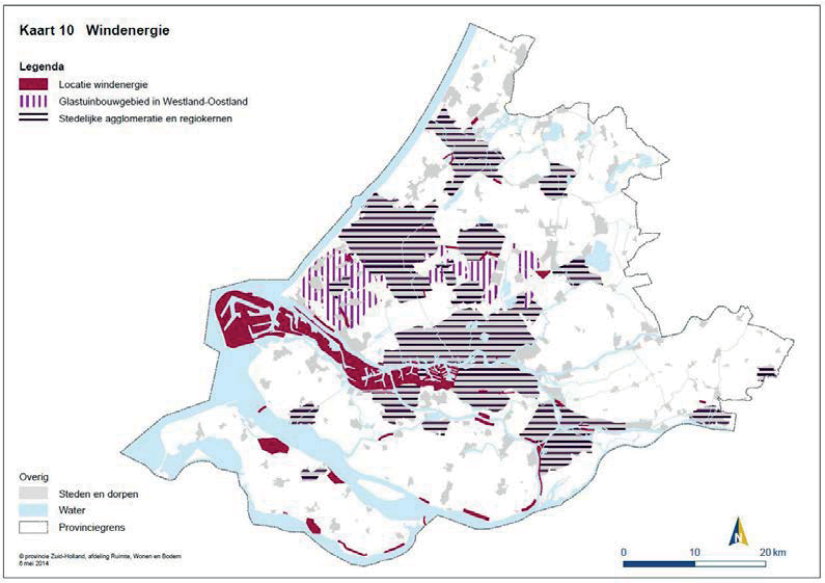


Figure 19. Wind energy zones in the South Holland Structure Plan (VRM) of 2014
Source: Province of South Holland, 2014

Figure 20. Wind energy zones in the national Structure Plan for Onshore Wind Energy (SvWOL) of 2014
Source: Ministry for Infrastructure and the Environment, 2014

3.1.4.2 Implementation strategy

Next to compulsory spatial rules, the VRM and SvWOL plans contained a set of requirements guiding the implementation process. The overall objective of the provincial and national governments was a 'maximum implementation of zones for wind energy' (Province of South Holland, 2014a, p. 78). This was promoted by the fact that provinces and national government had the power to license wind parks top-down.

The VRM responded to this (conditional) rule in a more nuanced way and specified the conditions under which South Holland would exercise its authority to approve wind parks. It announced that the province intended to take up a monitoring rather than an executive role. If local authorities did 'want to collaborate' (Province of South Holland, 2014a, p.78), the province would transfer its competence to take land-use decisions to lower levels of government.

> *If a promoter wants to develop a location that is part of the provincial Structure Plan, the province can always make use of its authority. Even if the affected municipality does not agree with wind energy development. But in cases where the municipality does agree, then, please, do it by yourself!* (Expert 06, administration, 2016)

South Holland thus followed its chosen course, namely avoiding top-down decision-making and building up the commitment of municipalities. Commitment would be secured in the established way, i.e. by signing wind energy covenants. But since the wind energy issue was urgent, a date was set by which local government could make up their minds. If municipalities submitted proposals for wind energy locations in local development plans by 31 December 2015, the province would refrain from taking executive action. In this context, municipalities could, if necessary, slightly adjust zone boundaries according to local conditions (Province of South Holland, 2014b).

In addition, though rather vaguely, the VRM contained stipulations concerning local participation in wind energy development. Wind turbine operators were expected to create opportunities for financial participation and compensation for the 'direct environment' (Province of South Holland, 2014a, p.78) of wind turbines. The SvWOL, too, stressed the importance of public support and participation, and announced that it would facilitate planning participation by 'mapping local interests' (Dutch Ministry for Infrastructure and the Environment and Dutch Ministry for Economic Affairs, 2014, p. 28); but it refrained from issuing rules concerning financial compensation: this should be left to market players.

> In the Energy Agreement, it is assumed that a fair distribution of gains and losses (compensation and participation) between developers and the local community is essential to increase support. The developers of wind energy project (associated in the NWEA) committed themselves to organising support by actively involving the local community. (Dutch Ministry for Infrastructure and the Environment and Dutch Ministry for Economic Affairs, 2014, p.28)

3.1.5 Effectiveness

This final part of the Dutch case study will discuss the statements of interviewees about the 'effectiveness' of the planning approach. Table 5 below summarizes the main planning decisions; it presents desired and undesired, intended and unintended effects.

Table 5. Desired and undesired / intended and unintended effects of South Holland planning decisions
Source: aggregated results of interviews
Note: *Expected* effects are indicated as (x)

Related to goal	Planning decisions	Desired effects (intended/unintended)	Undesired effects
ECONOMIC: sufficient amount of land to meet wind energy targets	Agreed target: 735.5 MW until 2020 Agreements on sub-targets per zone	wind energy growth restored in SvWOL zones (intended)	(x) amount of land insufficient to meet the 2020 target, rezoning needed during process
TERRITORIAL: resource-aware treatment of land	Positive zoning: large-scale zones for concentrated developments of more than 100 MW; smaller zones for more than 5 MW	compact, clustered development in large-scale zones (intended)	(x) installation of wind turbines in formerly safeguarded landscapes
SOCIAL: selecting accepted locations	Positive land-use criteria: industrial areas, transport infrastructure, coastlines	combination with industry widely supported by wind energy operators (intended)	local opposition in communities adjacent to Rotterdam port zone

Related to goal	Planning decisions	Desired effects (Intended/unintended)	Undesired effects
Maximum and timely implementation	Wind energy covenants with regional and local authorities	(x) two covenants will be implemented on time (intended)	one covenant failed, another never came into being
Local participation and compensation	Environmental management compulsory, but method is left to market players	exceptional rather than usual: selected projects with local participation / landscape fund (unintended)	strong local opposition and damage claims in the Rotterdam region

The effects presented in the table above relate to the spatial and implementation strategies used in the South Holland approach. The detailed compulsory

requirements concerning both parts of the regional planning approach to wind energy were described in the previous section. In the following passages, the effects observed and/or expected by interviewed experts will be examined carefully and related to the overall objectives: a sufficient amount of land for wind energy, resource-aware treatment of land, social acceptance, timely implementation, and local benefits.

3.1.5.1 Restored growth, insufficient amount of land: desired and undesired effects of spatial decisions

Concerning the economic goal of producing 735.5 MW by 2020, implementation so far has turned out below expectations. Although the annual capacity installed has increased, the amount of earmarked land proved to be insufficient. Only one year after the adoption of the VRM zones for wind energy, South Holland started to search for alternative locations. As a result, implementation was delayed or halted. The formal process involved in revising a provincial Structure Plan requires more than one year. Under these circumstances, the RVO (2017, p. 36) considered it very unlikely that the 2020 target would be met on time. There was uncertainty around an installed capacity of approximately 200 MW[19] – more than a fourth of the overall provincial target.

Interviewees, however, observed some differences in the implementation process between SvWOL zones and other (provincial) zones. There is a consensus among experts that the targets of the two SvWOL zones (the Port of Rotterdam and Goeree-Overflakkee) will be – albeit with some delay – met. On these zones, one unintended but positive effect was that the territorial strategy of concentrated development on large-scale areas had compelled authorities (national, provincial and local) to coordinate their action with implementation parties (landowners, local authorities, developers). The confined setting helped achieve the preferred wind turbines set-up, i.e. compact.

A real shortage of space was encountered in smaller (provincial) zones. Most problems were situated in the Rotterdam area, where the implementation of the 150 MW city-region wind energy covenant had stalled. Here, according to interviewed experts, development was severely limited by unforeseen 'technical constraints'.

One unintended consequence of the search for new sites was that it might require abandoning the landscape narrative, which protected open green landscapes. At the time when interviews were conducted, potential 'alternative' zones were

19 By the end of 2015, 335 MW wind energy capacity had been installed. This is equivalent to 46 per cent of the province's 2020 target. Of the remaining 54 per cent (323,6 MW), a large-scale wind park of more than 100 MW in the Rotterdam port area is still expected to be completed on time (RVO, 2017).

located in previous safeguarded areas. In this context, interview partners argued that this might have a domino effect on South Holland's credibility in the field of spatial planning:

> *Officially and legally our negative zones are now missing. If there are upcoming new locations we have to accommodate them, even if they do not fit in with the current spatial guidelines. It gives the impression that the province randomly selects locations.* (Expert 01, administration, 2016)

As regards the social goal (selecting accepted locations), experts considered that the land use combination of wind farms with industry and infrastructure was rather successful. In particular, this relates to support by wind energy operators for the chosen zoned areas. In contrast, experts had to admit that a sufficient level of acceptance by the local population had not been reached. The VRM and SvWOL zones – though complex locations from a functional (programmatic) point of view – may have fitted in with the general interests of market players and higher-tier authorities; but they directly bordered on residential neighbourhoods and recreational areas. According to interviewees, many projects in the Rotterdam Port zone were seriously constrained by the resistance of local residents in neighbouring communities.

3.1.5.2 Vanishing partner, domino effect on consensus: desired and undesired effects of implementation rules

The implementation strategy that consisted of concluding wind energy covenants with local authorities had diverging effects, at least in the opinion of the experts interviewed. On the whole, positive experiences outweighed negative (undesired) ones. At the time when the interviews were conducted, three (out of the planned four) pacts had been enacted: the Port of Rotterdam, the Rotterdam City Region, and the municipality of Goeree-Overflakkee. In the Port of Rotterdam and Goeree-Overflakkee the covenants had succeeded in creating pressure to achieve 'maximum development':

> *There is indeed no formal obligation; in the sense of 'if it's not possible, then don't do it'. It is an ambition, a commitment to make the effort. But the political side exerts dreadful pressure to achieve the Convenant goals. Because we have become so attached to fulfilling our ambitions.* (Expert 19, economy, 2016)

The Port of Rotterdam Authority and Goeree-Overflakkee facilitated coordination between public and private partners quite differently. While the Port Authority focused on the interests of the port industry, Goeree-Overflakkee was more focused on the interests of local residents; it promoted local economic benefits, public participation, and compensation by labelling itself an 'energy island'.

In the region of Rotterdam, an important institutional change seriously affected implementation, indeed delaying it. The regional authority (Rotterdam City Region) was abolished in 2015 and thus one of the most important covenant partners of

the province vanished.[20] The absence of leadership caused local government to draw back from wind energy promotion and earmarking local land. Consequently, the provincial authority had to take over a politically sensitive discussion: if zones fell away, which municipalities would take the blame and accommodate alternative locations so that the provincial energy target could still be achieved?

> *Now we have to search again for locations. What if these new locations lay within our municipal borders, do we then have to install 380 instead of 350 MW?* (Expert 05, politics, 2016)

The success of the intermunicipal wind energy covenant was thus highly constrained by changes in local and political opinions about wind energy development. In addition, experiences involving the Rotterdam City Region showed that the covenant strategy was rather inflexible if cooperation failed and a 'plan B' was needed.

In comparison, the national government's top-down approach as regards the location choice for large-scale wind parks succeeded in developing 'difficult' locations despite local disputes. So far, however, there is no wind energy project in South Holland that reaches the threshold for national involvement (100 MW). Experience gained with planned large-scale project 'Maasvlakte 2' shows that the threshold rule may lead to a shifting of responsibilities: Maasvlakte 2 changed in size during the planning process and, consequently, the authority in charge of approval oscillated between the national and provincial levels, creating uncertain conditions concerning the division of responsibility.

The last strategic choice discussed in this section relates to provincial stipulations concerning local participation and compensation. The statements of experts showed hardly any correlation as regards the way in which operators had organised communication and participation in South Holland's zones for wind energy. Local compensation and participation succeeded in some selected projects, but that was not the result of provincial or national rules; rather, it greatly depended on the willingness of the developer concerned and the demands of the local (approving) authority that were issued during a project's planning.

3.1.5.3 Effects of planning arena transactions: insufficient knowledge about spatial constraints

A couple of statements by interviewed experts addressed the effects of transactions between actors during the planning phase of *Nota Wervelender*. At that time, zones for wind energy were defined within a confined group of professionals. 'Non-experts', especially local implementation actors, were largely absent from decision-making.

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20 Partner responsible for implementation of the city region's wind energy covenant (Convenant Wind Energie Stadsregio Rotterdam). See section on conditions, Table 2.

The impact of this was twofold: economic experts stated that, by defining zoned areas in a top-down way, wind energy developers were treated as 'the big bad wolf' that had come to destroy an environment valued by the local population. Moreover, implementation actors' (e.g. affected municipalities and local population) restricted access to planning decisions resulted in a lack of knowledge concerning local motives for opposing or embracing wind energy development.

3.1.6 Conclusions

The wind energy planning approach of the Dutch province of South Holland was essentially based on considerations of landscape aesthetics. The approach was adopted in 2014 and framed by a landscape narrative that focused on the spatial orchestration of wind parks according to the provincial wind energy target of 735.5 MW installed capacity by 2020. The expectation was that a compelling narrative integrating wind energy growth and the main characteristics of the Dutch landscape would provide spatial focus and enjoy public support.

Hence, the South Holland planning approach was spatial-geographic, i.e. based on specifying the geographical setting in which it would be desirable to install wind turbines. Preferred areas were large-scale industrial sites and transport infrastructure, as well as transition areas between water and land. In the course of the planning process, however, provincial zones for wind energy were introduced into a national spatial plan for large-scale wind energy implementation and, as a result, the province had to abandon the wider spatial framework for safeguarded landscapes.

Planning approach: national and provincial zones, covenants with local partners

The South Holland zones for wind energy were identified by combining positive (allocation) criteria (with provisos for protection) with negative (exclusion) criteria functioning as safeguards. The criteria were based on two main considerations: the promotion of wind energy in areas 'where we would want it' versus the safeguarding of landscape 'where it would be unacceptable'. Local technical and societal constraints were not considered at the very first stage in order to avoid early showstoppers. Rather, the landscape narrative was created as a generic planning launch pad based on the expectation that conflict levels around wind energy would be low in industrial environments and in transition zones between agricultural land, natural areas, waterbodies, transport infrastructure, and urban areas. This resulted in distinctive domains of planned spatial aesthetics: large-scale concentrations of wind parks and smaller locations distributed across the provincial territory.

The distribution of power in Dutch spatial planning enabled the province of South Holland, and partly also the national government, to overrule local land-use plans

if these concerned projects of more than 5 MW (two large wind turbines). This, however, could lead to a rather tense political climate between province and municipalities. The province therefore sought to achieve an optimum understanding with local communities by using the agreed wind energy covenant as an instrument enabling local communities and other parties to arrive at mutually agreed location decisions.

The covenants are rather economics-oriented and nail down a specific unit size in megawatts to be reached by 2020 in the targeted zone. In exchange, the authority to approve wind parks is delegated to the local authority in the affected town or village. However, in case of obstruction and non-cooperation, the province can resort to top-down licensing and approval processes, but this is only used to avoid complete standstill.

The wind energy covenant is usually an agreement between main stakeholders within public administration; beyond this instrument, the South Holland planning approach provides little guidance concerning local participation and compensation. Exact terms for the involvement of the population in areas surrounding wind energy zones were largely left to the wind energy developer and local authority involved.

Conditions before 2014: government discourse and stagnating growth

From the perspective of the Dutch wind energy sector, renewable energy growth in the Netherlands was long hampered by a piecemeal approach to national spatial planning, which allowed Dutch provinces to adopt a wait-and-see attitude as regards wind parks. Whilst the national government strove to achieve consensus on the siting of large projects, development was delayed by negotiations between the Dutch state and its provinces for several years.

The province of South Holland, in contrast, had already adopted a proactive approach to wind energy. Nevertheless, the sector's growth was painfully slow. By introducing a 2020 wind energy target that entailed tripling the installed capacity of 2009, the province had manoeuvred itself into a precarious position. There was an urgent need for a comprehensive spatial planning scheme that would reach a compromise between the ambitious renewable energy goal and the very constraining implementation conditions in one of the most densely populated regions of Europe. The province finally decided in favour of positive zones and adopted a corresponding spatial policy in 2011.

From a governance point of view, the province of South Holland could exert substantial influence on wind energy decisions through top-down planning. The Dutch Electricity Act apportioned permit-giving powers concerning wind energy developments according to project size: each administrative level was responsible for a specific output range (expressed in megawatts): the national government had

to facilitate project proposals concerning an installed capacity of at least 100 MW; the twelve Dutch provinces were responsible for wind parks of 5 to 99 MW. Local authorities, at least from a formal point of view, could thus hardly influence large-scale developments.

Planning arena: national government dominates spatial decisions

The South Holland wind energy arena was largely characterized by internal discussions between different levels and sectors of government, in particular between national government and Dutch provinces, and between the ministries in charge of spatial and energy policies. The Dutch government attained a dominant position in the decision-making process when it decided to establish a national spatial planning policy for large-scale wind parks in 2012. At the national level, the main interest was to create stable conditions for the implementation of the national wind energy target. In consequence, each province had to provide the relevant surface area to meet an agreed wind power sub-target. What followed was an intensive discussion at national level between policy-making bodies, consultants, and market players.

Following the launch of the national government's wind park policy in 2012, the province of South Holland had to adjust its own spatial policy, which had only come into force a little more than one year before. During this process, most of the adopted positive zones were kept, since the province was bound to wind energy covenants that had been concluded with local authorities. However, two elements of the landscape narrative — negative zones and the wider spatial framework for safeguarded landscapes — were abandoned.

Effects of planning decisions after 2014: scarce land, insufficient growth

The South Holland landscape narrative has widely safeguarded polder areas from wind turbine blight, while achieving strong development on industrial land and along coastal areas. By 2017, however, the implementation of the South Holland 2020 wind energy target was seriously delayed and it became clear that significantly fewer wind turbines than expected could be installed in wind energy zones. The province of South Holland had recognized the limits of the chosen spatial strategy in terms of wind power output and announced a revision of selected zones.

The major roadblock to achieving the original goals were unforeseen spatial constraints in established smaller zones that largely fell under the jurisdiction of the province. In contrast, large-scale development in national zones for wind energy, the Rotterdam harbour, and the island Goeree-Overflakkee, was more promising. The planned adjustment of the South Holland planning approach to

wind energy will then likely lead to less stringent criteria for conserving valuable landscapes.

Expectations concerning the influence of the landscape narrative on public support for wind energy were also disappointed. In particular, unexpected resistance came from the communities surrounding the Rotterdam harbour. One point of contention was the erection of wind power generators on the harbour boundaries, directly bordering on residential neighbourhoods. Furthermore, there was increasing local political opposition in the greater Rotterdam region, notwithstanding that the communities in question had already signed a covenant to implement designated wind energy zones. The prescribed land-use criteria, however, were largely supported by market players, spatial and landscape planning professionals, and nature and environmental NGOs.

Despite disappointing developments in the Rotterdam region, the covenant as an instrument had powerfully influenced the implementation of other zoned areas. Interview responses indicate that although the covenants were declarations of intent rather than legally-binding contracts, the political pressure to reach set targets was high.

Wind energy covenants, however, became a barrier when South Holland decided to search for alternative locations. Territorial bargaining for a lower MW output has occasionally started between the various involved partners and public authorities. This is particularly the case when a regional development scheme is missing and discussions on alternative locations have come to a grinding halt. The interviewed experts blamed the technocratic approach by which agreements were established in terms of MW output to be reached by 2020. The wind energy pact strategy is therefore strongly dependent on the organisational structure, the authority, and the assertiveness of the involved partners. This worked well with the Rotterdam Port Authority, which manages the harbour area independently, but less so with regional partners.

The South Holland decision to leave standards of local compensation and participation to market players and local authorities resulted in substantial differences in the quality of environmental management and the size of local participation. In the worst case, inadequate communication of projected plans to the neighbouring population led to residents lodging damage claims and to serious damage to the image of the municipality involved in the licensing process.

Drivers and barriers: planning arena and knowledge

The South Holland zoning strategy facilitated the preparation of coordinated plans by wind energy developers and the compact siting of wind turbines. An essential parameter was the area size of a wind energy zone; for instance, the large-scale zones of the Rotterdam harbour area and the Goeree-Overflakkee island provided

more room to define the detailed location of a wind energy project than smaller (provincial) zones. Furthermore, the establishment of regional wind energy pacts was an essential driver for the achievement of energy targets. This, again, was especially the case as regards the Rotterdam harbour zone and the Goeree-Overflakkee island.

Drivers within the planning arena are related to the chosen type of interaction between planning participants and the generation of knowledge to support spatial decisions. At a national level, one important driver of wind energy decisions was the emphasis on 'a wide discussion' between planning and implementation actors. The planning arena, however, largely prevented non-professional actors, such as residents and municipalities, from having a say in wind energy issues.

One factor that had a negative influence (barrier) on the implementation of the South Holland wind power policy was the somewhat negligent generation of knowledge during the planning phase. The province based its land-use decisions on limited knowledge concerning local land-use constraints, having taken the decision *not* to screen the wind energy resources of selected zones through a strategic environmental assessment.

In this context, a wider implication of the approved positive zones was that zoning started to hinder, rather than promote medium-term wind power growth, when the provincial authority announced it was searching for alternative locations. The formal procedure to review the areas concerned was to last at least two years. By zoning wind energy, the province had created expectations among local authorities and residents about places where wind energy was not allowed. Besides, wind energy covenants had largely set the amount of MWs to be installed in the relevant areas. In this regard, the province clearly missed the spatial guidelines of the previous (abolished) policy that had also endorsed negative zones. These guidelines would have provided the necessary assessment criteria and arguments in the discussion about alternative locations.

Concerning local support for wind energy, one last main barrier was the top-down planning approach, which created little opportunity for affected residents to participate and state their opinions. Furthermore, local participation and compensation (e.g. benefiting from a share in a wind energy project) largely depended on the willingness of the wind park developer at the implementation stage.

3.2 Zoning wind energy through generic rules: the case of Lower Austria (Austria)

Figure 21. Wind turbines on agricultural land in the state of Lower Austria
Photograph taken by the author

3.2.1 Introduction

Austria became a forerunner in the installation of renewable energy supplies thanks to favourable conditions for hydropower and the early cancellation of nuclear energy plans. In 2009, the Austrian government adopted a wind energy target of 3000 MW by 2020 provided that 'enough sites are available' (GEA, 2012). At that time, the country already had an installed capacity of 1000 MW. However, the issue of site availability for some 700[21] additional wind turbines had never been investigated properly. Political agreement on wind park allocation at the national level did not exist — the national government refrained from intervening in the wind energy plans of the country's nine states. In consequence, regional wind power planning policies varied considerably between states, from fairly restrictive to pro-active, supportive approaches.

21 Own estimation.

The state of Lower Austria belonged to the latter category: it supported wind energy. The state government had adopted an ambitious energy roadmap that set a goal of 1900 MW installed wind energy capacity by 2020 and 3200 MW by 2030 (Office of the State Government of Lower Austria, 2011). Lower Austria would thus implement almost two-thirds of the national 2020 wind energy target.

Pro-active support for wind energy resulted from a long-standing tradition. Ever since the *Hainburg Movement*[22] of 1984, the state had set its sights on wind energy. At that time, large-scale hydro energy projects had become increasingly unpopular and, clearly, the time was ripe for wind. Former *Hainburg* activists founded pioneering wind energy companies that were co-owned and co-financed by local residents. These early energy cooperative ventures grew into medium-sized firms and became the main employers in parts of the state that were structurally lagging behind.

At the beginning of the 2000s, wind energy was hardly viewed as a national or state spatial planning issue: the main responsibility for spatial decisions was placed on local government. This changed when considerable dissent about land use grew at the local level. The rapidly developing sector, supported by government subsidies, created an overflow of project applications in regions with favourable wind conditions and, along with it, impacts that exceeded the scope of local planning. Increasingly higher wind turbines in one municipality started to hinder other forms of development in neighbouring municipalities. The adjacent state of Burgenland, which was experiencing a similar wind rush, took a pro-active attitude in spatial planning and introduced zoned areas.

The state of Lower Austria, in contrast, continued to favour municipal autonomy in wind energy decisions. Sporadic spatial planning efforts to zone wind power in the form of *kleinregionale Konzepte* (microregional schemes) were not approved by the state government. Zoning would exclude a number of municipalities from the fair chance to profit from wind energy, i.e. financial contributions by operators for the use of local infrastructure, which provided a steady income. Consequently, instead of adopting zoned areas, as in Burgenland, the state of Lower Austria decided to enact strict minimum distances from residential areas. This strategic choice would enable local authorities to expand these areas undisturbed by nearby wind turbines.

One unintended effect of the new policy was that wind energy increasingly clashed with nature and landscape protection interests. Innovations in wind turbine technology made it possible to generate wind energy in hitherto untouched areas, such as Alpine areas and forests in the eastern and northern parts of the state. A

22 In Hainburg, environmental activists prevented the construction of a large hydro energy plant in the floodplains of the river Danube. This is seen as one of the most important environmental movements in Austria, since it placed landscape values above green energy supply.

second effect was that developers were courting local politicians instead of competing for sites that were suitable from a higher-tier point of view (as was the case in Burgenland). This caused heated local political discussions about the municipal 'business case' for wind energy.

By 2013, wind energy turbines had spread to Radlbrunn, the hometown of Lower Austria's state governor, and thereby also entered the spatial planning agenda of the state government. Public criticism of the liberal spatial policy was hanging like a dark cloud over forthcoming state elections. At that time, some 300 wind turbines (700 MW) had already been installed and haphazard development affected large parts of the Lower Austrian landscape. Municipalities were divided into two camps. Community polls — whether residents were mainly 'against' or 'for' wind power — became common practice. In addition, environmental protection organisations — such as the national bird agency (Birdlife Austria) — were filing complaints in the course of approval procedures. In 2013, to calm things down, the Lower Austrian government finally enacted a temporary stop to the licensing of projects and announced the creation of zoned areas for wind energy.

The decision to zone wind energy led to a paradigm shift in spatial planning for wind energy in the state of Lower Austria and radically changed development conditions. The following sections of this chapter will discuss the emergence and impact of the Lower Austrian planning approach, using a structure similar to that applied in the previous case study.

The first part (Section 3.2.2) will introduce the ´conditions´, i.e. the factors that significantly influenced spatial decisions concerning wind energy. The presented evidence is based on interview data and complemented by document analysis. The subsequent part (Section 3.2.3) will focus on interaction between the main participants within the Lower Austrian wind energy planning and implementation arena. The third and fourth part (Sections 3.2.4 and 3.2.5) will discuss the components of the Lower Austrian planning approach and the effectiveness of planning decisions related to wind energy. The conclusions of each sub-question will be summarized in the final part of this chapter.

3.2.2 Conditions

This section outlines the factors that influenced spatial decisions concerning wind energy in Lower Austria. The findings are based on insights gained from expert interviews; these were verified and complemented by written evidence collected during document analysis, including strategic policy papers, announcements in the Austrian media or the position papers of interest groups.

The findings from the document analysis were arranged in chronological order to identify the main events related to wind energy within Lower Austrian spatial

planning. These events were then compared to the wind energy implementation process and to future growth targets, expressed in: annual growth of MW capacity installed (in Lower Austria and Austria) and the 2020 targets of the state and the national government. This exercise was summarized in the ´timeline´ of Lower Austrian wind energy planning and implementation below (Fig. 22)

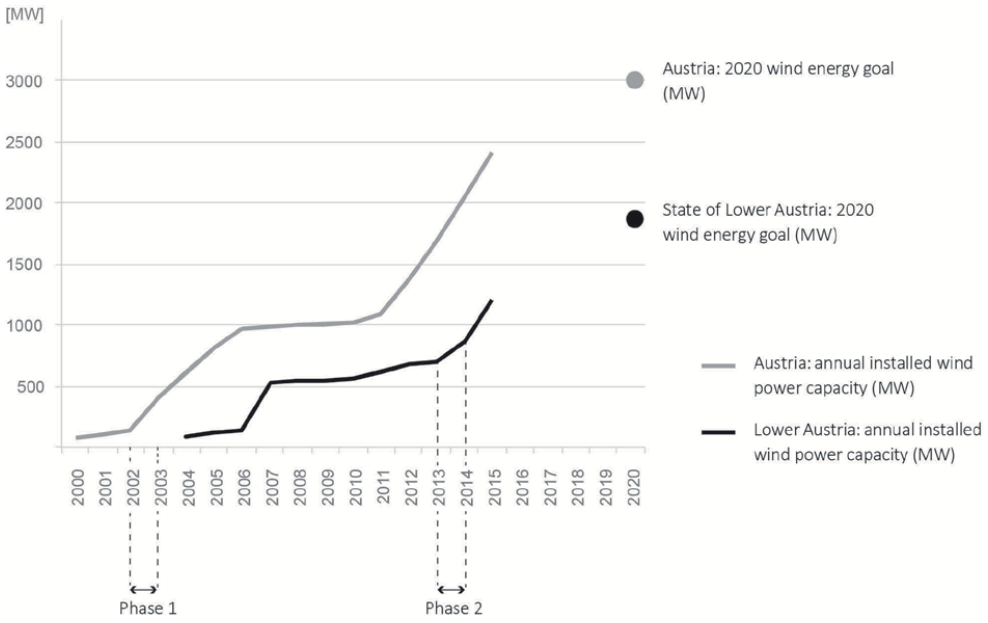

Figure 22. Wind energy growth and planning phases in Lower Austria
Figure by the author, wind energy data: Austrian Wind Energy Association 2014; 2016; 2017; Office of the State Government of Lower Austria 2011; 2014a

Phase 1, 2002-2003: Creating generic distance rules
Formalized as: adopted minimum distances in the Lower Austrian Spatial Planning Act of 1976
Phase 2, 2013-2014: Earmarking land for wind energy targets
Formalized as: Lower Austrian spatial planning ordinance for wind energy utilisation (2014)

The reconstruction of the timeline reveals two important wind power-related events in Lower Austrian spatial planning. The first (2002-2003) concerned the creation of minimum distances between wind turbines and wind-vulnerable land-use categories. This so-called ´distance regulation´ was adopted through an amendment of the Lower Austrian Spatial Planning Act. Ten years later, a second planning period (2013-2014) earmarked land (or positive zones) for wind energy that were formalized by the Lower Austrian Sectoral Spatial Planning Ordinance for Wind Energy Utilization (*Sek ROP Wind*) of 2014. The planning phases for both

policy changes were remarkably brief (one year), considering that the surface area of Lower Austria is by far the largest of all our three case studies[23].

Meanwhile (2004-2015) wind energy implementation in Lower Austria oscillated between vigorous and slow growth rates. It had been very successful: by 2015, the *Bundesland* provided roughly 40 per cent (Austrian Wind Energy Association, 2016) of the 2020 Austrian wind energy target (3000 MW). In particular, growth spurts took place during 2006 and 2007 (two years after the first planning phase), and during 2013 and 2015 (during/shortly after the second planning phase).

3.2.2.1 Aggregated results of document analysis: developments in spatial and energy planning in Austria and Lower Austria before 2014

National context

The Austrian state has three levels of government: the national level, the *Bundesländer* (states), and the municipalities. The federal constitution assigns responsibility for local planning to municipalities. Under the constitution, however, other aspects of planning remain unmentioned. Thus wind energy — just like other Austrian spatial planning issues — falls mainly under the responsibility of the nine Austrian states and their many municipalities (OECD, 2017).

Although the national government lacks formal authority to govern spatial planning, it has managed to exert substantial influence on wind energy development. For instance, it has approved national laws and launched plans in the fields of nature protection and aviation that affect the spatial distribution of wind energy projects. The national government has also approved financial support schemes that promote the generation of renewable energy. The most powerful law in this respect is the Austrian Green Electricity Act (GEA), adopted in 2012, which launched a significant expansion of wind energy. This concerned 2,000 MW capacity, in addition to the already operational Austrian capacity of 1,000 MW (2012). The (brief) stipulations related to wind energy are as follows:

> Wind power: 2 000 MW (corresponds to an additional average annual green electricity generation of approx. 4 TWh) provided that sites are available (GEA, 2012).

Site availability is the only reference within the document to potential spatial constraints that might develop from tripling the wind energy capacity installed. There has been no initiative at the national level to secure enough space for wind energy generation. Nevertheless, the GEA and its predecessors implicitly involved far-reaching spatial impacts. It maintained the existing mode of financial support (feed-in tariff or FIT) and established a stable framework for wind energy growth through to 2020 (Maringer and Krenn, 2015).

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23 Roughly 19 km2, or more than 6 times larger than the South Holland (2.8 km2) and East Flanders (3 km2) case studies.

In addition to sectoral laws driving wind energy implementation, there was also an attempt to achieve vertical coordination in spatial planning. Indeed the national government is a key actor of the ÖROK institution: the *Austrian Conference on Spatial Planning*. ÖROK can be described as a mechanism that enables collaborative efforts by national, state, and local planning actors (OECD, 2017). In this capacity, the ÖROK issues the ÖREK *Austrian Spatial Development Schemes* every ten years; these are *´primarily a voluntary agreement´* on medium-term *´scopes of action´* (ÖROK, 2011a). The ÖREKs are collectively drawn up by representatives of the three levels of government, as well as by business and civil society associations.

The most recent version of the ÖREK strategic documents addressed the long-term goal of energy self-sufficiency. It emphasised the task of securing land for renewable energy production and distribution:

> The generation of electric power by hydropower plants and wind farms as well as the use of solar power (…) require provisions in spatial planning. Taking environmental criteria into account, suitable locations for wind farms (…) are to be identified in order to achieve the expansion of renewable energy generation. (ÖROK, 2011a)

The ÖREK recommended the creation of positive zones for renewable energy but it did not specify which land-use combinations would be suitable from a supraregional point of view. Instead, it referred to the planning approach of the Austrian state of Burgenland (2010) as a good practice:

> 'It has reduced the assessment efforts of regional and local authorities and, at the same time, has increased the planning security for wind park operators.' (ÖROK, 2011b)

Burgenland has adopted *Eignungszonen* (suitable zones) for wind energy and has created integrated regional schemes for wind parks since 2002. Thus the state has been a pioneer in comprehensive planning for wind energy. At that time, regulatory frameworks in most Austrian states were very restrictive (see Table 6 on p. 111). Five out of nine states had adopted spatial policies, but these rules did not necessarily promote wind energy. In fact, most Austrian states had neither defined wind energy targets, nor completed a large number of projects.

Table 6. Overview of spatial planning policies concerning wind energy in Austrian states, 2013
Sources: Office of State Government of Burgenland, 2012; Felber and Stoeglehner, 2014; Office of State Government of Upper Austria, 2014; Austrian Wind Energy Association, 2014.

State	Spatial planning policy	Zoned areas	Wind power targets	Installed capacity end 2013 (MW)
Burgenland	zoning plan + generic minimum distances (1,000 m*)	positive zones	1,000 MW in 2020	770 MW
Carinthia	generic minimum distances (1,500 m*)	none	none	1 MW
Lower Austria	generic minimum distances (1,200 m*)	none	1,900 MW in 2020, 3,200 MW in 2030	797 MW
Upper Austria	zoning plan + generic minimum distances (800 m*)	positive and negative zones	none	26 MW
Salzburg	none	none	none	0
Styria	zoning plan + generic minimum distances (1,000 m*)	positive zones	100 MW in 2025	82.6 MW
Tyrol	none	none	none	0
Vienna**	none	none	none	7 MW
Vorarlberg	none	none	none	0

*relates to the distance between wind turbines and permanently inhabited areas; the exact definition of wind-vulnerable residential use varies across the nine Austrian states.
** Vienna has much fewer opportunities for development in comparison to other states. It is by far the smallest state in surface size and the most densely populated one.

Energy and spatial policy in the state of Lower Austria

Like its neighbour Burgenland, the state of Lower Austria has been promoting wind energy for a long time. The Lower Austrian renewable energy policy was introduced in 2011 under the motto ‘renewable, regional, and self-sufficient´. It pursues the goal of regional energy self-sufficiency by relying mainly on renewable

sources. Medium-term (2015, 2020) and long-term (2030) energy goals have been formalized in the *Niederösterreichischer Energiefahrplan 2030* (Lower Austria Energy Roadmap) of 2011. Like other renewable energy sources, wind energy seemed a promising option to achieve these:

> Our country is largely blessed with superb wind conditions. No other technology can substantially increase the generation of green electricity at comparably low costs. The state will prioritise the utilisation of this resource and support its expansion by all available means. (Knoll et al., 2014)

This strategic roadmap adopted a pathway towards generating 100 per cent of Lower Austrian energy demand from renewable sources by 2050. Medium and long-term goals were expressed in quantitative targets for each renewable source. For wind energy, the adopted targets were 1900 MW installed capacity by 2020 and 3200 MW by 2030 (Office of the State Government of Lower Austria, 2011).

The degree of precision with which wind energy was given a role in a comprehensive, long-term strategy did not apply to spatial planning policies. Lower Austria, just like most other Austrian states, lacked a comprehensive spatial scheme for wind energy. The state government had only enacted generic rules that regulated the location of wind turbines. These rules were listed in an *Abstandsregelung* (Distance Regulation), as an addition to the Lower Austrian Spatial Planning Act of 1976. It set minimum distances between wind energy generators and specific (vulnerable) land-use categories. These are:

- 1.2 km to residential areas;
- 0.75 km to detached residential buildings, allotment gardens and campsites;
- 2 km[24] to residential areas of neighbouring municipalities.

The Distance Regulation was published in 2003, when a basis was urgently needed to monitor the compliance of local land-use plans. Around that time, wind energy had created considerable intermunicipal conflict, especially when turbines were sited in close vicinity to a neighbouring municipality.

In Austrian states, municipalities have the power to designate land for wind energy. States act as a supervisory authority and may reject plans, but this has to be well-argued. It was therefore necessary to create guidelines (at a higher governance level) for the reasoned rejection of wind power developments. Lower Austria considered two options that would produce suitable rules for the approval of wind energy plans: a planning approach à la Burgenland (zoned areas) or stricter ´rules of the game´ (minimum distances).

24 May be reduced to 1.2 km.

The first option enjoyed little political support within the Lower Austrian government. Between 2003 and 2008, there were several attempts to create wind energy zones for selected, intermunicipal areas. These plans were not approved by the state government. They concerned *Kleinräumliche Konzepte* (microregional schemes) for the areas of Bruck an der Leitha, Marchfeld, Mistelbach-Gaweinstal-Sulz and Waldviertel Ost (Knoll et al, 2014). One main reason for the rejection of the plans was that they would reduce the opportunity to reap financial benefits from wind energy:

> *These microregional schemes had been shelved by the politicians. The Council of the State Government wanted local councils to decide whether or not they wanted wind energy. Each municipality should have the opportunity to acquire funding for their municipal budgets.* (Expert 11, administration, 2016)

The second option, enforcing minimum distances, seemed to strike the right balance between local planning autonomy and top-down zoning. Minimum distances were defined in accordance to those land uses that needed protection. The distances from residential land within neighbouring municipalities were particularly generous. The reasoning behind this was that the dimensioning must allow for future expansion of residential cores. If distances were solely based on emission standards (noise, shadow), once a wind turbine was permitted, other developments would have to comply with this type of land use:

> *There is this physical emission boundary of 800 metres and, in addition, I need a distance of 400 metres to projected residential development because the opportunity for a municipality to authorize residential land use should be kept open. Once a wind turbine has been allowed, residential development will be constrained. To keep a buffer space for development, we had defined a distance of 400 metres. This rationale has been embedded in legislation and is still valid.* (Expert 09, mediators, 2016)

The Distance Regulation constituted an initial zoning approach, even though there was no comprehensive spatial plan. The zones were: unsuitable areas (excluded by minimum distances and other laws that prevent wind energy generation) and grey, intermediate areas (i.e. in-between unsuitable areas) where development could potentially take place. Since large parts of Lower Austria are highly suburbanised, excluded areas cover the outskirts of towns and villages, as well as areas where the spatial structure is dominated by detached buildings. As a result, wind parks were structurally channelled into green (unbuilt) areas: agricultural land and other rural settings that were not protected by law.

3.2.2.2 Aggregated results of interviews: factors influencing the Lower Austrian planning approach to wind energy

Following the document analysis of national and state policies, and of the spatial planning system, we will now turn to interview findings. The aim of this section is

to identify the rules-in-use, or factors, that influenced the Lower Austrian planning approach to wind energy, in the opinion of interviewed experts. Whether these factors had a positive (or negative) impact on wind energy deployment will be discussed later on in the Section 3.2.5 of this case study chapter, which will present evidence concerning the effectiveness of the Lower Austrian planning approach.

The findings of this section are based on interview statements that were compiled and classified into fourteen main factors. Table 7 (p. 115) presents the results of this exercise; it describes the territorial, social, and economic conditions that prevailed as regards wind energy before and after the adoption of the Lower Austrian planning approach.

Table 7. Factors influencing the Lower Austrian planning approach to wind power
Source: aggregated results of interviews

Factors influencing wind energy deployment in Lower Austria (before 2014)			Tendencies and events (after 2014)
Territorial	Biophysical attributes	Larger wind turbines restrict urban expansion of villages and towns. In addition, the combination of wind energy and forestry becomes possible	none
		Most sites in eastern parts of Lower Austria have been used up. Northern forest areas and western Alpine areas come into consideration	none
		Several important bird habitats. Endangered species became increasingly exposed to wind turbines	none
	Rules and regulations	Lower Austrian planning law has prescribed strict distances from vulnerable functions since 2003	none
		Municipalities hold considerable responsibilities as regards strategic wind energy planning	none
		Strict safely regulations also apply to transport infrastructure. The most impactful is the risk of icefall	none
Social	Community aspects	Selected intermunicipal initiatives drafted microregional schemes	plans were never approved
		The national bird agency lodges complaints and regularly prevents or delays wind energy development	none
		Community polls became common practice within the local decision-making process concerning wind energy	none
		Local politicians enjoy a high degree of autonomy in spatial decisions and exercise a strong influence on regional politics	none
	Shared values	Ever since the Hainburg Movement of 1984, the state has adopted a pro-active attitude towards wind energy	The pro-active attitude has changed to a reserved attitude
Economic	Market aspects	Wind energy has become an important industrial sector. Medium-sized, regional companies dominate developments	Global firms are increasingly involved in developments
	Rules and regulations	Financial contributions by operators for the use of local infrastructure provided for a steady income for municipalities	none
		The GEA of 2012 established stable financial conditions for investment into wind energy	A bottleneck in the issuing of the green energy certification causes delays in implementation

Before discussing in greater detail the territorial, social, and economic factors that constrained the Lower Austrian planning approach, two observations can be derived from this table.

The first observation is that social factors were considered highly important in the Lower Austrian case, in particular the attempts of earlier, bottom-up initiatives to construct zoning plans for wind energy in selected areas of the state (microregional schemes) and the notorious opposition of NGOs to wind turbines in bird-sensitive areas. These community aspects decidedly differed from those found in South Holland where, according to interviewees, wildlife protection and bottom-up planning initiatives were not among the factors that greatly influenced planning decisions. Equally, one economic factor (financial contributions by operators for the use of local infrastructure) is a specific, contextual rule.

The second observation concerns the changeableness of factors over time. In Lower Austria, conditions for wind energy deployment were altogether relatively stable. Events indicating change that are highlighted in the table were of an economic or social nature, such as the country´s green energy support regulation, the market parties involved in developments, and the political attitude towards wind energy.

Territorial conditions

The formal rules and regulations that we identified, such as the Lower Austrian Distance Regulation and the distribution of power in spatial planning, have already been explained at length in the previous subsection (pp. 109ff.). In addition, there were three biophysical attributes that influenced wind energy deployment according to interviewed experts.

The first attribute concerned innovations in wind turbine technology that had a physical impact on other forms of land use. According to this expert, increasingly large wind turbines started to hinder urban expansion on the outskirts of towns and villages despite the adopted minimum distances:

> *However, priorities have shifted owing to larger wind turbines. In the current situation, we need our 1200-metre gap solely for the emissions. Or more specifically: the 400-metre buffer, which was originally intended for municipal development, has increasingly been needed to compensate for the increased size of wind turbines.* (Expert 09, mediators, 2016)

However, the criticism of the higher emission impacts caused by higher wind turbines is somewhat misleading and demands further explanation.

This criticism concerns the generic, higher-tier Distance Regulation rather than project-level rules for health and safety standards in environmental law (i.e. noise and shadow flicker by operating wind turbines). At the time when the distance rule was devised, according to interviewees, the high-impact area of a wind energy project was delimited at a generic distance of 800 metres. The remaining 400

metres served as a buffer for future (residential) development. According to the evidence collected for this thesis, the size of the impact area is debatable (cf. Felber and Stoeglehner, 2014). Although scientific proof could not be acquired in the course of our research, some interviewed professionals shared the opinion that 500 metres would usually cover the undesirable emissions of modern wind turbines.

Hence, the generous ´impact area´ illuminates the basic notion behind the Distance Regulation, namely, to steer wind energy towards areas where it certainly would not hinder residential development. Because wind turbines had increased in size, the line of thought was that their impact would automatically affect a larger (than 800 metres) area and this, in turn, was constraining local plans — in the worst case, the plans of a neighbouring community. The above quote therefore refers to the emerging attitude among administrative and political actors that wind energy had reached the limits of its growth.

The second biophysical attribute illustrated in the table was the state´s diversity of natural landscapes. Lower Austria has a surprising variety of geographical structures, which range from plain, hilly landscapes in the northeastern part to Alpine ranges in the southwestern part. Territorial (and social) conditions presiding over wind energy vary greatly from one Lower Austrian *Viertel* (district) to another:[25]

- Most wind turbines were implemented in the northeastern, wine-growing district: the *Weinviertel*. The region enjoyed excellent wind conditions, in particular the easternmost part, but here, the low-hanging fruits of available sites had already been picked.
- The northwestern district, the *Waldviertel*, has an extensive forest cover and, thanks to innovation in turbine technology, had a good development potential. By 2013, developers had increasingly expanded their activities to this district.
- Large areas were affected by urban sprawl in the southeastern and western districts, the chiefly industrial *Industrieviertel* and orchards-covered *Mostviertel,* respectively. However, part of the Alpine range was not protected by law from development.

The third attribute is connected to the second (variety of the Lower Austrian natural landscape), namely: habitats for protected bird species. This factor will be explained in greater detail in the next part on social factors.

25 The term *Viertel* (district) describes the division of the state's surface in four main regions: Industrieviertel, Mostviertel, Waldviertel, Weinviertel. These are insignificant in terms of formal planning rules, but they do prescribe established natural habitats and cultural entities with strong identities.

Social factors

The Lower Austrian government did not exert any influence on the wind energy policies of local authorities but, rather, searched for a pragmatic approach to calm down local disputes. The chosen instrument of reconciliation, the Distance Regulation, meant that wind parks were mostly installed in green areas. Combination with other land uses, for instance industrial, commercial, or transport infrastructure-related, was equally constrained. [26]

Wind energy production on fields, grasslands, and forests, even at a due distance from populated areas, did however provoke opposition from another quarter, i.e. the national bird protection NGO:

> *The Distance Regulation was not beneficial as regards bird protection and this resulted in the very same problem having to be dealt with simultaneously under ten different legal proceedings. This increasingly led to wind energy becoming discredited in the eyes of the general public.* (Expert 17, mediators, 2016)

Lower Austria was blessed with habitats and transit corridors for protected bird species that happened to compete with potential wind energy locations. By 2013, the national bird agency (Birdlife Austria) and other ornithological organisations were increasingly getting involved in local wind energy affairs, lodging complaints during approval procedures. [27]

Besides conflicts that evolved from the Distance Regulation with respect to bird protection, the interview quote illuminates another undesired impact: although wind energy had been perceived as a common good ever since the *Hainburg Movement* (p. 105), local residents increasingly turned against it. Local opinion polls had become common practice. Referenda for or against wind energy projects meant that the issue was settled through a majority popular vote rather than a unilateral local-level political or expert decision.

Economic conditions

The Lower Austrian wind energy industry was a highly influential economic sector, both within the state and beyond. Many operators had their origins in Lower Austria, where they had developed from pioneering, private initiatives into medium-sized companies. These locally well-connected stakeholders were, by 2013, important employers in the eastern and northern parts of the state. In addition, global investment firms increasingly held shares in Lower Austrian wind energy companies.

Besides the creation of jobs, and the growing influence of the sector in general, interviewed experts put income opportunities (financial benefits) for local

26 Commercial and industrial districts usually fell within the area excluded by the distance regulation.

27 Certain bird species can be killed by the rotating blades of wind turbines.

communities high on the agenda of economic 'conditions'. Wind parks provided income for municipalities because they had to pay compensation fees for the use of local infrastructure. This income was the source of a rising conflict between pro-wind and anti-wind communities because it led to the accusation that local approval was 'bought' by wind energy developers:

> *There have been cases where it was alleged that land use designations had been purchased from municipalities by operators. This is a strong accusation that is connected with the negotiation around the infrastructure cost contribution; this is payable for every wind turbine site, every year. Essentially, the municipality has a financial incentive in having wind power generators in its catchment area.* (Expert 04, mediators, 2016)

These payments were, in fact, co-financed by national subsidies for wind energy. The financial support consisted of an obligation to buy renewable electricity supplied to the national grid through fixed payments (feed-in tariffs or FITs). FITs are guaranteed payments that were periodically adjusted by ordinance of the Austrian government. The level of the FIT is a powerful factor of wind energy growth and therefore its adjustment has led to strong fluctuations in wind energy investment. The most recent subsidy programme (GEA, 2012) created a solid basis for wind energy growth until 2014. It led to a (record) increase of 300 MW per annum from 2012 to 2014 (Austrian Wind Energy Association, 2014).

However, there are restrictions for new projects independently of the FIT. Projects are only granted a purchase commitment and a FIT if they obtain a contract with the OeMAG institution. [28] The OeMAG fund for project contracts decreases every year.

3.2.3 Planning arena

We can date the emergence of a Lower Austrian planning arena for the creation of wind energy zones in 2013, when the state governor ended the building permission procedure for wind power projects, stating that there had been an 'uncontrolled growth of wind power in the region which has to be stopped' (Pröll, cited in Die Presse, 2013).

Once the decision to draft a comprehensive plan for wind energy had been made, the state government wished to frame it in a neutral way. The adoption of exclusion zones did not fit in with the pro-active energy policy. On the other hand, positive zoning had certain drawbacks as well. For instance, it might suggest that the state of Lower Austria was trying to impose wind energy developments on affected local authorities. Another possible evil was that by introducing (more) spatial constraints, long-term targets in the state´s energy roadmap would be put at risk. The spatial planning approach of the state of Lower Austria therefore

28 OeMAG stands for *Ökostromabwicklungsstelle*; it is the Austrian organisation in charge of buying green energy at the FIT and selling it to electricity traders.

became a tightrope walk between economic interests (wind energy promotion) and spatial interests, i.e. preventing haphazard development.

3.2.3.1 Aggregated results of interviews: participants of the Lower Austrian planning and implementation arena

Table 8 (p. 121) presents the planning and implementation actors in Lower Austria´s wind energy arena. They were selected on the basis of interviews and, if necessary, their relevance was verified through document analysis. Just as with the South Holland and East Flanders case studies, the position of the different actors was interpreted on the basis of expert opinion and structured according to five topics: actor level, spatial-organisational level, core position, planning, and implementation.

Table 8. Planning and implementation actors in Lower Austria
Source: aggregated results of interviews

organisation	position				policy document		
	actor level	spatial-organisational level	planning	implementation	Distance Regulation (2004)	Lower Austrian Energy Roadmap (2011)	Sek ROP Wind (2014)
Austrian Federal Ministry for National Defence and Sport	AD	macro	x				x
OeMAG administration centre for eco-electricity	AD	macro		x			
ÖROK Austrian Conference on Spatial Planning	AD/ IM	macro	x				x
Austrian Wind Energy Association	EC	macro	x	x			x
BirdLife Austria	IM	macro	x	x			x
Environmental protection NGOs: *Umweltdachverband* and *Ökobüro*	IM	macro	x				x
Wildlife protection NGOs: KFFÖ, WWF, Global 2000, Greenpeace	IM	macro		x			
Lower Austrian Department for Environment and Energy Law	AD	meso	x			x	x
Lower Austrian Department for Building and Spatial Planning Law	AD	meso	x		x		x
Lower Austrian Advocacy for Environment	AD/ IM	meso	x				x

organisation	position				policy document		
	actor level	spatial-organisational level	planning	implementation	Distance Regulation (2004)	Lower Austrian Energy Roadmap (2011)	Sek ROP Wind (2014)
Spatial and landscape planning consultant	IM	meso	x		x		x
Lower Austria's state governor	PO	meso	x				x
Lower Austria's state minister for Environment, Agriculture and Energy	PO	meso	x				x
Active developers	EC	micro	x	x			x
Landowners	EC	micro		x			
Affected Czech residents (near the Austrian-Czech border)	CI	micro		x			x
Affected residents	CI	micro		x			
Affected municipal councils and mayors	PO	micro	x	x			x

Legend
Planning core actor

Acronyms
AD administration
CI civil society
EC economy
IM intermediary
PO politics

The information in the table illustrates the central position occupied by actors from the state´s public bodies and government within the planning process. In addition, consultants identified within the fields of spatial planning, landscape

planning, and environmental protection exerted substantial influence on planning decisions.

On the other hand, national and local actors were largely uninvolved in spatial planning decisions, excepting the national bird agency (Birdlife Austria) and some local councils; in particular, the influence of mayors was emphasised by interviewed intermediary-level experts.

Some actors identified during the case study were positioned both in the planning and implementation processes. These actors were:

- BirdLife Austria, which was an advisory body during the planning phase, but also actively influenced implementation by lodging complaints during project-level approval procedures.
- Active wind energy developers who held positions on the ground in specific regions and whose implementation knowledge supported planning decisions.
- Affected local authorities, who lobbied against or in favour of wind energy projects during the planning process.

As regards implementation actors, one striking feature of Lower Austria´s wind energy arena is the large number of national environment and wildlife protection NGOs. The main economic implementation actors were, in addition to the Austrian wind energy association (IG Windkraft), the group of ´active developers´. These are wind developers who actively acquired land utilisation rights by concluding licence agreements with landowners in the various regions of the state of Lower Austria.

Following this brief introduction to the structure of Lower Austria´s planning and implementation arena, we will now turn to the core actors in the planning process.

3.2.3.2 Actors and their positions

State of Lower Austria

The main actors in the state of Lower Austria came from state agencies (*Landesbehörde*) as well as from the political side, the state government (*Landesregierung*). The differentiation between bureaucracy and politics is important in the case of Lower Austria, because administrative and political actors sometimes acted according to divergent motives, which had to be attuned within the planning arena.

The planning approach was shaped by two departments of the state in charge of energy and spatial planning: the *Abteilung Umwelt- und Energierecht* and the *Abteilung Raumordnung und Regionalpolitik*. Political direction for both these departments came, according to interviewed experts, mainly from one actor: the *Landesrat für Umwelt, Landwirtschaft und Energie* (State Minister for the Environment, Agriculture and Energy). On the other hand, the then-

Landeshauptmann (state governor) kept a close eye on the planning process, since wind energy had been a central issue during the 2013 state government elections:

> *It was of paramount importance to generate a map that showed which objections have been voiced, how many, and where they were coming from. Politicians always want to know who exactly their opponents are, and where they are located; this was an important step in the internal discussions.* (Expert 10, administration, 2016)

The government had enacted a building stop until the earmarking of land for wind power had become effective. This was a strategic choice to calm down the local-level political discussion about wind energy. The wind rush in previous years had considerably damaged relations between the state and local politicians. In this context, the state governor had put landscape blight caused by sprawling wind turbine development on the spatial planning agenda of Lower Austria:

> In many communities, operators had secured prior claims on plots by obtaining the permission of landowners for development. In consequence, nobody knew exactly how many wind generators would be developed and where exactly. It is precisely this uncontrolled growth that shall now be stamped out. (Pröll, cited in Die Presse, 2013)

All the same, local planning should still enjoy a high degree of autonomy, as this interview quote suggests:

> *There was certainly the political will to give the matter a positive slant. And not merely to say: 'There and there, nothing should happen'. But to announce: ´These are the areas where the state prioritises wind power generation, but municipalities that oppose this kind of development may decide not to make use of them.´ Municipalities still had to ensure the availability of these areas for future wind energy use and avoid encroaching residential development.*(Expert 11, administration, 2016)

Hence, the energy and spatial planning departments of Lower Austria had to achieve consensus around three goals that stood in contrast to each other: the energy goal, the environment/landscape protection goal, and the political goal. The objective in terms of renewable energy was to safeguard the ambitions of the adopted *Energiefahrplan*. In environmental terms, it was to safeguard landscape and wildlife assets. In political terms, it was to appease feelings within the local communities.

Consultants

Consultant work within the Lower Austria planning arena was strongly focussed on environment and wildlife protection issues. Participants were already exasperated by project proposals and political lobbying for wind energy in natural settings. In the opinion of the *Fachleute* (experts), general environmental protection legislation offered too little protection:

> *All experts were irritated by absurd questions: 'Is wind power possible here?'. An increasing number of financial investors were emerging on the Lower Austrian wind energy market, who had been told repeatedly: 'It is not possible' — e.g. in nature parks. All the same, they made financial offers to municipalities. And thus the local mayor would approach the Minister of*

> *the state: 'I still want to have it, regardless'. And then we had to explain once again why it was not possible.* (Expert 09, mediators, 2016)

During the course of the interviews, it emerged that three professional actors deserved particular attention.

The first was a private spatial and landscape planning consultancy that had developed the principles defining the Distance Regulation. Being the acknowledged author of the hitherto applied approach, a critical evaluation of its impact was not in its interest.

The firm represented two fields of expertise at the same time (spatial and landscape planning, see quote below) and was commissioned to execute the laborious process of zoning the vast surface area of the state. The consultant was also commissioned to set up the *Umweltbericht,* which documented the SEA[29] of the adopted policy:

> *The consultant represented two disciplines at the same time: spatial planning and landscape planning. Thus they were not dealt with separately. Decision paths were mostly rather idiosyncratic.* (Expert 17, mediators, 2016)

The consultancy captured a key position in the planning arena because the energy and spatial planning authorities only assessed (instead of devising) fundamental decisions during the planning process. It elaborated the main method and principles that led to zone selection. In addition, the firm was responsible for the interpretation of consultancy work carried out by other professionals and for the fairly technical procedure involving the mapping of potential zones on the Lower Austrian territory. This was described as such:

> *For this purpose, we developed a zoning method based on ´ unbundling´. The state wanted positive zones — so we developed positive zones by separating them from negative ones. That is to say, we did not search for zones ´where it can be done´, but for zones ´where it can´t be done´.* (Expert 09, mediators, 2016)

In addition to the spatial and landscape planning consultancy, two other professional organisations took up a main position in the planning arena: the NGO BirdLife Austria and the *Umweltanwaltschaft Niederösterreich*, an institution close to the authorities that represents the public interest, especially as regards nature and environmental protection. The latter had a formal role in the SEA. It had to approve proposed plans and was therefore jointly responsible for the outcome.

Together with the spatial planning and landscape consultancy, and the relevant authorities of the Lower Austrian government, the *Umweltanwaltschaft*

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29 According to Lower Austrian law, the set-up of such a plan demanded screening by strategic environmental assessment. In this context, the office was commissioned to create the ´environment report´, which documented the knowledge exchange that eventually led to earmarked land.

determined the ´scoping´[30] of the strategic assessment of zones for wind energy. In this role, the *Umweltanwaltschaft* mediated between community interests (local residents' initiatives, NGOs) and higher-lever political goals. It closely exchanged knowledge with universities and other environmental NGOs.

The third main consultant, BirdLife, was commissioned by the *Umweltanwaltschaft* to define bird exclusion areas on a sound functional basis. As an umbrella organisation, BirdLife enabled knowledge exchange with locally active ornithological groups. Birdlife was also a major actor in the wind energy implementation arena. It considerably constrained wind energy deployment by lodging complaints during the approval procedure. A second argument in favour of involving the agency in the planning process was that it maintained elaborate data about bird species, hatching, and behaviour:

> *We were integrated and contributed our expertise, partly as a consultant but above all we possessed a vast amount of data. Our great strength is our extensive database in the field of ornithology.* (Expert 17, mediators, 2016)

BirdLife (2011) objected to wind turbines in Alpine ranges and other elevated areas in the northern and western parts of Lower Austria (*Waldviertel, Mostviertel*) which, at that time, were becoming increasingly popular for wind farms (see Section 3.2.2.2 on p. 113). But it also objected to development in more traditional places. Among these were large parts of the *Weinviertel*, in particular the *Marchfeld* area, and wide areas along the national border with the Czech Republic and Slovakia.

Austrian Wind Energy Association

The Austrian Wind Energy Association *IG Windkraft* is the lobby organisation for Austrian operators, developers, and other supporters of wind energy. The interest group operates at national level, but has nevertheless strong professional links to Lower Austria. Major wind energy companies have their headquarters in Lower Austria, out of which they operate across the whole of Austria and even internationally. In addition, the EVN Lower Austrian utility company, which is mainly owned by public authorities (EVN, 2017), is one of the largest wind energy operators in Austria.

The IG Windkraft (and its members) was not necessarily against the proposal to zone wind energy – the Burgenland approach seemed to work rather well in the opinion of this expert:

> *At the beginning of the 2000s, the state of Burgenland convened the stakeholders and started earmarking areas for wind energy. Everybody came together and the main*

30 The term scoping describes the formally required procedure to set the scope of a Lower Austrian strategic environment assessment.

> *consideration was: ´We want to achieve the energy transition and if that is the case, how can we do it in the most tolerable way.´* (Expert 16, economy, 2016)

The main concern of the agency was the very serious loss of political support at higher governance level and how this would affect spatial decisions. Altogether it was not a favourable time to 'seize the moment' of higher-tier interference in local decision-making for the benefit of wind energy. After all, the overall political message was to introduce restrictions and serve local interests:

> *First of all I need determination, really wanting to achieve the energy transition. For if I stuck to a zoning plan along the lines: 'So now we'll just ditch every damn'd place where it'd get in the way' well then, nothing would be left at the end of it.* (Expert 16, economy, 2016)

The grey-zone location policy of the Distance Regulation had, until then, evened out local opposition rather well. In search for development locations, one municipality could be played off against the other. But now, the reduction of available space would entail fewer options for locations. In many parts of Lower Austria local support had hit rock bottom, and there was no indication whatsoever that the state authority would promote implementation in planned zones by intervening in local affairs.

Active developers

Active developers were wind energy initiatives that had secured plots for potential developments and/or lobbied for local support in a certain area. Because the state government usually did not interfere in local land-use decisions or in the planning approaches of market parties to developing sites (i.e. communication and participation of local population), the combined efforts of active developers centred on persuading local politicians to back wind energy. Promising strategies to achieve local support ranged from trade-off deals (e.g. by paying for the use of infrastructure or offering a share in the business[31]) to intensive communication efforts to convince affected residents. This had become increasingly important because political decisions were often motivated by the results of community polls.

Active developers who had established strong relations with local authorities were far from happy with the decision to zone wind energy. This mostly concerned regions where several companies had a long tradition of producing wind power and had developed from a grassroots movement to a major employer. In other regions, according to interviewed experts, wind park operators were more inclined

31 Many operators pursued a business model which enabled private persons to profit from development. Indeed Austrian citizens hold a considerable amount of shares in wind energy companies, be it in the form of stocks or as limited partners.

to favour the idea of zoning wind energy because it was more difficult to influence local decision-making.

Another important factor that justified the presence of active developers in the Lower Austrian planning arena is that they represented a considerable knowledge source as regards assessing regional wind energy potential and impacts on protected wildlife. Before entering into local negotiation/communication processes, developers had usually already acquired some preliminary knowledge about wind conditions, site availability, and environmental impacts.

Local authorities and politicians

Local authorities cherished the power that they wielded as regards land use for wind energy. At the same time, the impact of wind parks went well beyond the reach of local control. For instance, green areas that were valued for their recreational significance came into consideration for development. These local values were not sufficiently protected by legislation. In particular the *Waldviertel* had specialised in a form of tourism that promoted a traditional lifestyle and untouched landscapes. The utilization of the 'common good' of landscape — energy source versus local, touristic asset — became a point of contention in local land-use planning.

3.2.3.3 Interaction between actors

Having presented the main interests of core actors, this part turns to interactions within the Lower Austrian wind energy arena. These took place within a comparably confined group of professionals originating from state authorities and consultancies:

- The Lower Austrian environment and energy department and the Lower Austrian spatial planning department facilitated exchange with professionals (in the field of knowledge) and politicians (as regards policy framing).
- The main spatial principles for the selection of areas suitable for wind energy were proposed by the spatial and landscape planning consultancy.
- Other consultant work was reduced to the identification of bird protection areas. This task was commissioned to the BirdLife interest group.

Interaction between these actors was widely reduced to the exchange of knowledge through written documentation or data. Participating administrative actors did not actively take decisions but rather checked whether proposed solutions were in line with state interests. Particular attention was paid to landscape, nature and wildlife protection, the promotion of recreational land use, a 'regional balance' in the distribution of zones, and the wind energy targets of the *Energiefahrplan*.

Planning choices rather lacked in transparency according to this consultant:

> *The positive zones were not identified collectively, it was just that our data was incorporated. Where our advice was heeded, areas were excluded and where not, we were ignored.*
> (Expert 17, mediators, 2016)

Relevant implementation actors such as active developers, community organisations, and local government were consulted, but they were not invited to actively take part in planning decisions. The general reason for avoiding a wide discussion with implementation actors was the need to concentrate on energy and spatial planning goals at a higher governance level. Professionals were to produce sound solutions that would satisfy general rather than local interests. The creation of zones for wind energy was therefore largely executed without the involvement of those affected:

> *You definitely would not be able to take decisions by involving the affected parties. This was clearly an expert planning issue. Neither operators, municipalities nor the State Minister can be asked. The latter had the political wisdom not to interfere. You have to shoulder the responsibility as an expert – just as a surgeon operating on a knee would.*
> (Expert 09, mediators, 2016)

A rather curious transaction developed between BirdLife and private wind energy developers. Locally active developers had gained considerable knowledge about environmental constraints in the context of *Machbarkeitsstudien* (feasibility studies). To accelerate decision-making, developers agreed to share their knowledge and co-finance the creation of bird protection areas. This knowledge was then recorded in the BirdLife database.

> *The resources available to execute our task of defining exclusion areas were insufficient. Operators knew that they would make no headway if they did not pay — i.e. they financed their own consultants in order to provide data. That was not an easy process, because when operators make a financial contribution they also want to have a say. We partly accepted that, but we also told them: 'There is no point concluding things now that will come again through the back door anyway'.* (Expert 17, mediators, 2016)

Creation of knowledge

Knowledge creation during the planning phase was strongly constrained by time pressure. The formal requirement was that the *Sek ROP Wind* had to enter into force within one year (2013-2014). Hence it was a rather Herculean task to take precise decisions within a short time that would cover an extensive territory.

The most time-efficient approach was to generate wind energy zones by pooling knowledge about conflicting land uses, supported by GIS methods for combining data with geographical references. The accumulation of conflicting land uses, or negative criteria, then provided for 'exclusion areas'. These areas were subtracted from the total Lower Austrian territory.

The resulting leftover space was theoretically suitable for wind energy generation, at least from the perspective of the state. The professional term for this rather technical exercise is *Abschichtungsverfahren* (unbundling procedure).

> *GIS technology enables us to take decisions in an elegant way — suddenly, only 15% of the state surface needs to be considered. (…) by pressing a button I can print out a ´What would happen if…´ decision. And I can directly see its impacts, I can compute area balance sheets, which goes some way towards energy objectives. This means that planning decisions can be compared with energy goals. We have only been able to do this type of zoning since we have had GIS.* (Expert 09, mediators, 2016)

Knowledge about conflicting land uses concerned two categories:

- areas that were protected by law;
- areas that were otherwise considered unsuitable for wind energy.

Data for the first category were largely generated by digital geographic datasets and in consultation with representatives of affected fields in public administration. These were: spatial planning, energy, traffic, aviation, nature protection, environmental law, and forestry (Knoll et al., 2014).

The creation of knowledge about the second category of conflicting land uses was more labour-intensive. It concerned the identification of areas where considerable opposition was to be expected. Most of the knowledge was gained from the database of Birdlife Austria. Other applied sources were the zoned areas in microregional schemes (see Section 3.2.2.1 on p. 109). On the subject of valued landscapes, several NGOs, mostly community initiatives, had submitted position papers and studies (Knoll et al., 2014). Finally, there were also implementation studies by wind energy developers that included knowledge about conflicting land uses.

The unbundling procedure quickly produced a first selection of potential zones (see Fig. 23, p. 131). Roughly eighty per cent of the total Lower Austrian territory was excluded by applying the Distance Regulation. Leftover areas were then screened for their wind energy potential on the basis of archived project proposals and consultation with local developers.

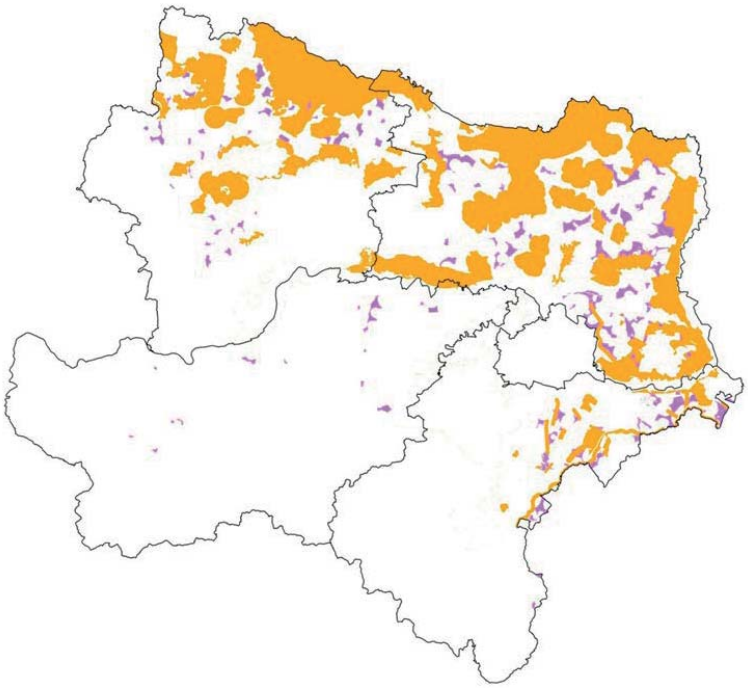

Figure 23. Exclusion areas suggested by BirdLife Austria (orange) and pre-selected wind energy zones (purple)
Source: Knoll et al., 2014

The last step involved the presentation of pre-selected zones for wind energy to the public. This was a step formally required by the SEA; it enabled affected parties to react to, and influence the proposed policy. According to submitted positions, wind energy zones might be abolished, made smaller or expanded. According to this expert, local government considerations were strongly taken into account:

> *We received 1500 objections after the publication of the programme. It was, of course, difficult to fight them off, politically-speaking. We attempted to classify them: to correlate objections with project areas; in this way, pretty soon it became clear that only a few areas were being contested, where there were protest marches with petitions. And there were also many objections requesting additional areas. But we could not take these into account, except in a few rare cases.* (Expert 10, administration, 2016)

3.2.3.4 Map of Lower Austria´s planning and implementation arena

The final subsection about Lower Austria´s wind energy arena presents a map of participants involved in planning (yellow) and implementation (white). Interaction between the different parties is indicated by lines. Just as with the South Holland and East Flanders case studies, line thickness indicates the intensity of the exchange.

As explained before, Lower Austria´s wind energy arena consisted of a limited number of participants, compared to the other case studies. The circle of experts involved in planning decisions was intentionally kept small. Public authorities at the national level played hardly any role in spatial decisions, excepting the ÖROK Austrian Conference on Spatial Planning that advised lower-tier authorities on how to create zoned areas for renewable energy.

The main actors in Lower Austria´s arena were positioned at administrative, political, and intermediary levels (Fig. 24, p. 133). Politicians, in particular local politicians, had a strong influence on planning and implementation. The main planning actors were the state departments for energy and the environment, and for spatial planning, along with selected consultants. The main implementation actors were the Austrian Wind Energy Association and BirdLife Austria, which operated at the national level. At the local level, implementation actors involved affected local residents, active developers, and landowners.

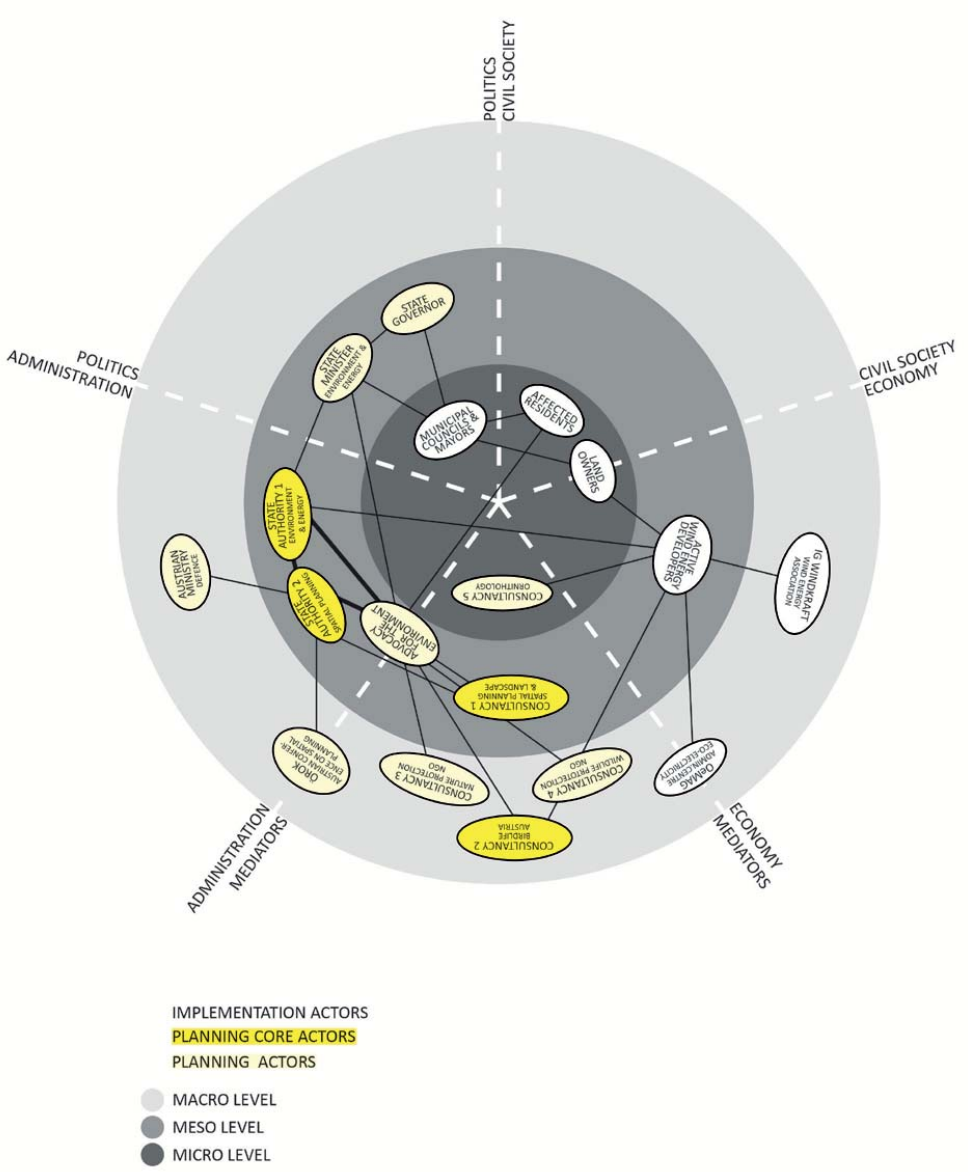

Figure 24. Lower Austria wind power planning arena
Positioning participants according to five actor dimensions and three levels of wind energy policy-making
The black lines relate to the intensity of interactions between different participants.
Figure by the author

The information in the figure also casts some light on crucial participants who enabled interaction between other actors. These were:

- Lower Austria´s energy and environment department, which shuttled between political actors, consultants, and active developers.
- The *Umweltanwaltschaft*, which was positioned between state administration and community interests, and was concerned with environmental issues, such as the national bird protection agency.

On the other hand, the figure shows vacant spaces, or missing links, in the vertical coordination of planning and implementation. Interviews revealed little interaction between national and state spatial planning institutions as regards spatial decisions concerning wind energy. Although the general advice of the ÖROK to zone renewable energy was implemented, the state obviously did not pursue an approach ´à la Burgenland´. Besides, there was no apparent formal coordination in wind energy planning at a regional (intermunicipal) level. Emerging cooperation between local communities in the context of microregional wind energy schemes was, according to interviewed experts, the result of bottom-up initiatives. At each level, administrative actors altogether acted highly independently from one another.

3.2.4 Planning approach

In 2014, the state of Lower Austria adopted 68 zones for wind energy. The zoned areas were to reconcile the conflict about land use, in particular friction between economic interests, wildlife protection, diverging local political goals, and large-scale landscape blight. Steering a middle course to deal with a highly controversial issue was certainly the main reason behind the emergence of the Lower Austrian planning approach.

Just as with the South Holland and East Flanders case studies, Lower Austrian decisions did not always refer to the latest adopted policy. Hence in this analysis, attention was also paid to resumed, 'unchanged' decisions based on earlier policies. In the case of Lower Austria, the state´s planning approach is composed of ordinances from three regulatory frameworks:

- the Energy Roadmap of 2011;
- the Distance Regulation in the Lower Austrian Spatial Planning Act;
- the zoned areas of the *Sek ROP Wind* (Lower Austrian spatial planning ordinance for wind energy utilisation) of 2014.

The specific decisions that were formalized in the above-mentioned laws and policy documents are presented in the previous section (p. 136). The information is arranged in the same manner as for the South Holland and East Flanders case studies.

The listed decisions refer to a specific *spatial-organisational level* (macro, meso, and micro). Furthermore, we have differentiated decisions belonging to the planning approach's *spatial strategy* from those belonging to its *implementation strategy*.

According to the conceptual framework of this thesis, spatial strategy focuses on the creation of zoned areas. Implementation strategy, on the other hand, focuses on the process-oriented task of governing wind energy development.

Again, specific attention has been paid to the *options* that were considered during the planning phase. These choices relate to economic (E), territorial (T), social (S) and governance issues (G). Section 4.2.2.3 (p. 203) will then reflect on the total set of available options detected in all case studies.

Table 9. Lower Austria´s planning approach to wind power of 2014: planning decisions and levels of policy making

spatial-organisational levels		options available	planning decisions	formalized in
MESO (state level)	spatial strategy	E1. land requirements for energy targets: general vs zone-specific targets	3200 MW by 2030, 1900 MW by 2020, distributed over 68 zones for wind energy	Energiefahrplan (2011) Sek ROP Wind (2014)
		E2. size of zones: minimum / maximum	Minimum area size of 40 ha (8 wind turbines)	Sek ROP Wind (2014)
		T1. concentrated / dispersed development	Principle of *regional balance* and *concentrated development*. Most zones in the regions of Weinviertel, Waldviertel and Industrieviertel.	Sek ROP Wind (2014)
		T2. types of zones: positive / negative / other	Positive zoning but neutral labelling: '§ 19 zones'	Sek ROP Wind (2014)
		S1. generic rules / spatial-geographic approach	Generic rules: minimum distances of 0.75 km / 1.2 km / 2.0 km to various *windkraftsensible Widmungsarten* (wind-vulnerable land-use categories)	Nö ROG (1976), § 19 Abs. 3a
		S2. land use constraints / combinations	Land-use constraints that result from: minimum distances and existing wind parks; protected nature, landscape, wildlife corridors and bird habitats; touristic areas; air traffic safety; areas close to the national border; areas where local opposition was considerable	Sek ROP Wind (2014)
	implementation strategy	G1. upscaling / downscaling level of decision-making	Local authorities decide whether they allow wind energy or not, state controls legality of spatial decisions and monitors wind energy growth	Sek ROP Wind (2014)
		G1. upscaling / downscaling level of decision-making	Selection of exact location for a wind energy project is a local planning task	Sek ROP Wind (2014)
		G1. upscaling / downscaling level of decision-making	Residential development and other wind-sensitive land use is not permitted in zones for wind energy	Sek ROP Wind (2014)

spatial-organisational levels		options available	planning decisions	formalized in
MICRO (municipal / intermunicipal level)	spatial strategy	S2. land use constraints / combinations	Land-use constraints and combinations (*Tabuflächen* and *Eignungsgebiete*) of microregional schemes	Sek ROP Wind (2014)

On basis of the information presented above, we can single out the main characteristics of the Lower Austrian planning approach to wind energy.

The planning approach is rather confined to the spatial-organisational level of the *Bundesland.* This absence of a multilevel approach to wind energy was for the most part predetermined by the characteristics of the Austrian planning system, which only provides limited opportunities for higher-tier authorities to coordinate the wind energy initiatives of lower levels of government, in particular as regards coordination between national government and state authorities. Furthermore, concerning the coordination between the state and municipalities, Lower Austria did not actively apply informal methods to achieve the local coordination of wind energy development. For instance, a wider application of microregional schems for wind energy would have been possible, but this was not suggested by the state authority.

3.2.4.1 Spatial strategy: creation of zones through generic rules

In the Lower Austrian case study, positive zones were generated by subtraction, or exclusion, of areas that were considered 'unacceptable'. Planning choices therefore clearly concentrated on the definition of land-use constraints, instead of defining desired land-use combinations. This strategic choice, together with the applied ´unbundling´ method, drastically reduced the area available for development (see Section 3.2.3.3, p. 128).

While previously, in theory, roughly 15 per cent of the Lower Austrian surface area was suitable for wind energy, the *Sek ROP Wind* reduced this to 1.5 per cent (Knoll et al., 2014). This reduction placed the state of Lower Austria in a difficult situation, since it affected the framing of the planning approach in relation to the task of ´positive zoning´. Although the political message should have been a positive one (wind energy growth), combined planning efforts came from the opposite direction (spatial constraints). In consequence, instead of ´priority zones´ or ´implementation locations´, a more neutral label came into play:

> *The labelling of Lower Austria´s wind energy zones is ´§19 zones´ instead of ´suitable zones´. This communicates the fact that zones still have to be reviewed in detail. At state level, it is obviously not feasible to state: ´Exactly here, is it possible´. The state of Burgenland had labelled its wind energy zones ´suitable zones´ which, by the way, also have to be reviewed. Nevertheless, the authority is more strongly committed.* (Expert 04, mediators, 2016)

The '§19 zone' label was meant to communicate that, considering the vast territory of the state and the relatively short planning period, it was necessary to review the zoned areas and specify their exact boundaries – i.e. local authorities had to precisely define the siting of a wind energy project. But a more positive labelling would have involved a stronger commitment of the state authority to promote implementation. This was undesirable from a political point of view, considering that the pro-active wind energy policy had received much criticism during the previous years.

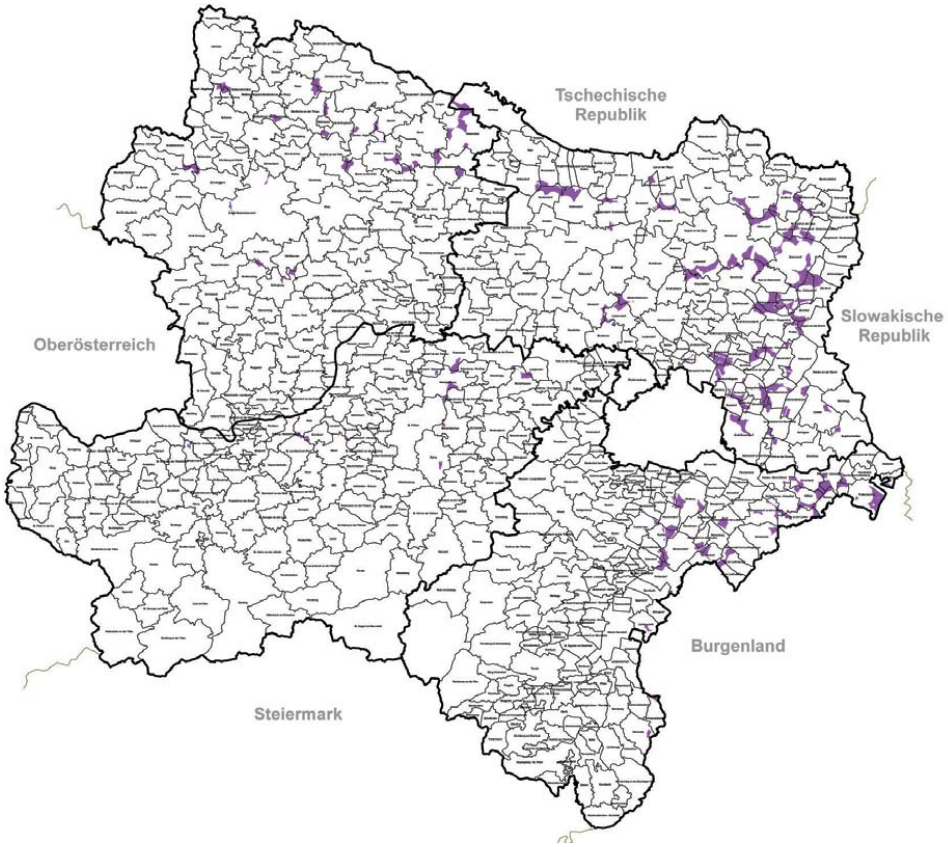

Figure 25. Regional distribution of wind energy zones across Lower Austria.
The majority are situated in the northern and eastern parts (regions of Waldviertel and Weinviertel)
Source: Office of the State Government of Lower Austria, 2014b

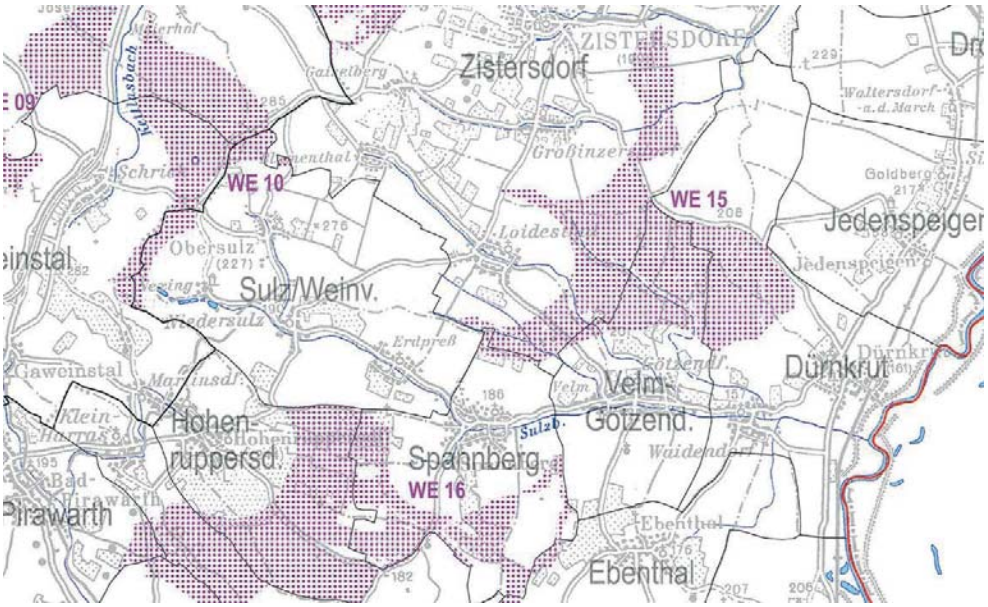

Figure 26. Wind energy zones in the Weinviertel region.
The shape of the zone is determined by a 1200 m distance from residential functions.
Source: Office of the State Government of Lower Austria, 2014b

Negative land-use criteria

The most important strategic choice was to retain the Distance Regulation. Thus, although the *Sek ROP Wind* enacted the notion of zones for wind energy, it did not cause a paradigm shift in spatial planning. On the contrary, it built on decisions that had been applied for more than ten years. The establishment of wind energy zones thus resulted for the most part from generic minimum distances:

> The designation of these zones is essentially based on the distance regulations to wind power-sensitive land uses, the interests of nature conservation, ecological value of areas, the visual appearance of towns and landscapes, tourism, the protection of Alpine space, the network infrastructure, the expansion possibilities of existing wind parks and a regional balance of wind power development. (Office of the State Government of Lower Austria, 2014b, p. 1)

Besides the Distance Regulation, other adopted generic distances that greatly influenced the spread of wind energy locations were:

- A ten-kilometre wide area along the Austrian border: it was excluded from development to avoid conflict with the Czech Republic.
- Five-kilometre wide *Sichtachsen* (visual impact zones) around potential wind energy locations: these were taken into account on the basis of formal

> regulations related to environment impact assessments for large-scale wind energy projects.

Other negative land-use criteria of the *Sek ROP Wind* concern valued natural areas and landscapes insufficiently protected by law, such as landscape scenery valued by the local community, wildlife corridors, and bird habitats.

Positive land-use criteria

Besides exclusion principles, a number of positive criteria influenced the creation of wind energy zones as well. The most important criterion was the safeguarding of a sufficient amount of land to meet the state´s wind energy target. Zones had to be spacious enough to accommodate the adopted goal of 3200 MW capacity installed by 2030.

> The aim of the spatial ordinance programme is to define zones that enable the deployment of a sufficiently large number of wind turbines in order to meet the targets of Lower Austria´s Energy Roadmap 2030. (Office of the State Government of Lower Austria, 2014b)

In addition to wind energy targets, expansion opportunities for existing wind parks were taken into account as positive land-use criteria (Knoll et al., 2014). Other criteria referred to more qualitative goals. The principle of '*Regionale Ausgewogenheit*' should provide for a fair distribution of zones across the four main districts of the state. However, the application of this principle was effectively constrained by the different biophysical conditions prevailing in each *Viertel*. The Mostviertel (5 zones) was most difficult because it was highly suburbanised. Wind energy zones therefore favoured the Waldviertel (18 zones), Industrieviertel (17 zones) and Weinviertel (28 zones). In addition, the plan introduced a minimum size of 40 hectares (8 wind turbines) as a selection criteria (Knoll et al., 2014). This was meant to facilitate concentrated development.

The last positive criteria that was used to define Lower Austrian wind energy zones concerned sites that had already been agreed under microregional schemes. Although it was not possible during research on this case study to ascertain whether these locations were fully adopted in the final version of the plan, according to the SEA report (Knoll et al., 2014), they constituted important selection criteria.

3.2.4.2 Implementation strategy: setting up the framework and laissez-faire

Lower Austria´s implementation strategy includes few strategic decisions. These mainly relate to the intensity with which the state government sought to influence decisions at the local level.

In terms of an active attitude to wind energy implementation, the planning approach did not enact any rules that would impose development on affected municipalities. Nor did the state of Lower Austria interfere in the local practices of

developers concerning public participation and compensation. In principle, local authorities can still decide whether they want wind energy or not. This attitude of ´laissez-faire´ already made itself felt in the labelling of wind energy zones ('§19 zones', see previous subsection on spatial strategy).

Government action was reduced to setting up a framework introducing spatial conditions that would rather favour development. One issue in this context was to create ´acceptable´ space (see first quote below). Another measure of precaution was to restrict the approval of land uses that would limit land availability for wind energy in §19 zones (see second quote):

> Thanks to the clear positioning of many municipalities and the highly committed consultation procedure, the end result was wind energy zoning with a higher implementation probability, and accordingly, a lower implementation risk. This will also lead to greater planning security and faster procedures. (Knoll et al., 2014, p.1)

> Within the wind energy zones specified in Appendixes One to Four, the initial designation of building land for housing purposes, (…) is not permitted. (Office of the State Government of Lower Austria, 2014b)

3.2.5 Effectiveness

From the beginning, the Lower Austrian planning approach to wind energy has been Janus-faced. While its spatial strategy (positive zones) suggested support for wind energy, its implementation strategy neither attempted to influence local decision-making nor did it seek to facilitate maximum development. It seemed that Lower Austria had already reached saturation point and, consequently, planning efforts concentrated on spatial restrictions.

Just as with the South Holland and East Flanders case studies, this study evaluates the effectiveness of the Lower Austrian planning approach in terms of economic, territorial, and social goals, as well as implementation goals. And, again, the main findings are based on interview statements verified by written evidence collected during document analysis. In addition, effects were compared with autonomous developments, which shaped implementation independently from spatial planning decisions. These conditional developments are presented in Section 3.2.2.2 (p. 113)

Table 10 summarizes the desired and undesired effects of the Lower Austrian planning approach to wind energy identified during the case study. Not all results could be measured, hence some rely on expert evaluation. These are indicated by (x).

Table 10. Desired and undesired effects of the Lower Austrian planning approach
Source: aggregated results of interviews
Note: *Expected* effects are indicated as (x); ´not applicable´: effects that cannot be accounted for by interviews.

Related to goal	Planning decisions	Desired effects (intended/unintended)	Undesired effects (unintended)
ECONOMIC: sufficient amount of land to meet wind energy targets	Agreed target: 1900 MW by 2020, 3200 MW by 2030	(x) Implementation exceeds the mid-term 2020 target (unintended)	(x) Additional space is necessary for the 2030 target
TERRITORIAL: resource-aware treatment of land	Zoning with neutral labelling (§19 zones), zones can accommodate at least 8 wind turbines	(x) Dismantling of wind turbines in valued landscapes and natural environments (intended)	Did not prevent haphazard development on agricultural land
SOCIAL: selecting locations enjoying public acceptance	Negative land-use criteria: generic minimum distances, exclusion of areas where local opposition is high	Bird agency keeps lodging complaints against wind energy projects, but to a much lesser extent (intended)	Municipalities in areas designated for wind energy often decide against wind energy development
Maximum and timely implementation	Local authorities should decide whether they want wind energy or not	(x) Relatively successful development in southern and eastern zones (intended)	Strong local opposition in northern (forested) locations
Local participation and compensation	Local participation and compensation are left to market players	Not applicable	Not applicable

This overview shows that undesired effects of the planning approach largely result from local opposition to wind energy development. This matches the findings about conditions, i.e. that after 2014 the pro-active political attitude changed to a reserved attitude towards wind energy growth. In addition, economic experts stated that there was a bottleneck in the issuing of green energy certification, which caused delays in implementation.

While these observations relate to general trends concerning the impact of planning decisions, interviewed experts largely agreed on one striking, specific effect: there was considerable variation in implementation across the different regions of the state of Lower Austria. While implementation in eastern and southern regions was generally relatively successful, it largely stalled in northern areas.

In the following sections, we will turn to the identified impacts in greater detail.

3.2.5.1 Effectiveness of spatial decisions: sufficient mid-term growth, unaccepted locations

Interviewed experts made an optimistic assessment of the implementation of the state´s mid-term 2020 goals, whereas economic actors were less positively disposed. At the time of interviewing, the subsidy system was increasingly delaying development and projects had to queue for several years to obtain the green electricity certification. However, there were enough projects in the pipeline to cover, even exceed, the 2020 target.

Expectations concerning the 2030 target, i.e. 3200 MW, were altogether less rosy. The sizing of the §19 zones was based upon this (long-term) target and, therefore, the zones were rather generous as regards the implementation of mid-term goals. So far, implementation experience indicates that there is insufficient potential to achieve the 2030 target. This, in the opinion of interviewed experts, was not the result of spatial constraints. Instead, local willingness to implement wind energy projects turned out to be weaker than expected. This resulted in a growing mismatch between calculated and (locally) approved wind power capacities:

> *There are enough zones, but in some zones the political will for implementation is lacking. The zones merely allow municipalities to approve wind farms. And this option can be declined. (*Expert 10, administration, 2016)

Compared to the fairly unanimous opinions about the relatively successful implementation of energy goals, experts' opinions about the impact of territorial decisions were highly divergent, depending on the viewpoint from which this subject was perceived. The main focus was on the protection of nature and wildlife, and the exclusion of landscapes valued for recreational use. On the basis of the recently-adopted rules, existing wind parks outside zoned areas are doomed to be dismantled.

But if the planning approach succeeded in safeguarding valued nature and wildlife assets, it neglected other goals of sustainable development. Considering that the distance regulation still steers wind energy into green areas and that implementation rules do not facilitate compact development, it is highly unlikely that the sprawling of wind turbines will be prevented. Landscape-related aesthetic aspects, such as desired set-ups of wind parks or alternative land-use combinations, were not addressed by the Lower Austrian planning approach:

> *The problem of the Distance Regulation is that it has forced wind turbines into areas that were of interest for bird protection. Because they were sparsely populated places. And this tension is likely to increase in future (…). Why not move closer to built-up areas — industrial zones, motorways, railway tracks – after all, it should be possible, shouldn't it? With some political awareness and willingness, it really could come about and, in my opinion, nobody would complain.* (Expert 17, mediators, 2016)

The main deficiency of the generic distance rules is that it excludes land-use combinations that might be more desirable (from an environmental and landscape protection point of view) than agricultural land. Another negative aspect is that it did not allow any regional variation in the definition of zones. This conclusion can be related to the social goal of the ´creation of accepted locations´ (i.e. locations that enjoy public acceptance). Although the zones were defined in the expectation that local support for wind energy would be high, interviewed experts observed great variation in local opposition. In the *Waldviertel*, the combination with forested tracts was still a highly controversial matter, while in the *Weinviertel* and *Industrieviertel*, implementation got off the ground more easily. This has led to suggestions that the never-approved microregional wind energy scheme approach might have been a more successful driver of development:

> Should one have continued developing these microregional schemes in the whole state? Would that have been the better option? *Exactly, and that worked fine and drove forward the planned expansion. And, finally, it was too late. Not much has happened since then.* (Expert 16, economy, 2016)

3.2.5.2 Effectiveness of implementation strategy: local opposition remains

The Lower Austrian implementation strategy granted the main responsibility for wind energy developments to local communities. The expectation was that, by excluding areas where local opposition was obviously strong (see Section 3.2.4.2, p. 140), stable conditions would be created for implementation. The strategy was ´laissez-faire´ in the sense that the state would not interfere in transactions between local implementation actors. This resulted, as explained in the previous section, in a high degree of regional variation.

In the opinion of interviewed experts, successful implementation took place in those districts that were already familiar with wind turbines as a feature in their landscapes. Generally, however, affected local authorities often decided against wind energy development. This means that the planning approach did not create more planning security for wind power operators in any way, which led to criticism within the wind energy sector:

> *State policy-makers had the preconceived idea that the zoning plan would calm down wind energy opponents. A total misjudgement in my view and that had to be expected. Because if you give somebody what they want, and their recipe works, then they want more and just keep going. This is exactly what happened.* (Expert 16, economy, 2016)

In this context, the neutral attitude of the state towards local land-use decisions was an additional source of disappointment and, according to interviewed experts from the economic sphere, constituted an obvious barrier to the achievement of long-term growth:

> *In comparison with the zoning plans in Burgenland and Styria, we had been hoping for easier licensing in unbundled zones, which apparently are areas with a much lower potential for conflict. However, precisely the opposite happened owing to the prevailing political*

> *scepticism: now I have a reduced area and more difficulties in getting projects approved, because assessments are more restrictive than before.* (Expert 16, economy, 2016)

3.2.5.3 Effects of the planning arena: discontented implementation actors

The last part of this section provides a few observations about effects that did not directly flow from planning decisions, but from the general set-up of the planning arena.

The first observation is that decisions were not always comprehensible to the consultants involved. Decisions were largely unilateral. One main problem was that the planning approach emerged at the time when the wind energy market had already conquered a fair share of the Lower Austrian territory:

> *The problem during the zoning process was that the bounties had already been divided up. Operators had already concluded LOIs* (letters of intent) *with local authorities and landowners. Thus all the zones that we had designated as no-go areas were definitely a loss for them. It does make a difference, whether it is like a blank board and everybody has equal chances. That was not the case, the opportunities had already been given out.* (Expert 17, mediators, 2016)

The dilemma faced in the planning arena was thus that it took shape at the stage where ´most of the goods had already been sold´. Moreover, the set-up of the arena as a ´closed expert circle´ did hardly provide opportunities for the coordination of, and exchange with local stakeholders, such as active developers, affected citizens, and local landowners.

3.2.6 Conclusions

The Lower Austrian planning approach to wind energy expressly aimed to define positive zones. Paradoxically, these wind energy zones did not arise from criteria defining where wind energy would be desirable from a spatial or energy perspective, but rather by subtracting all exclusion areas. Decision-making therefore largely concentrated on the definition of generic distance rules and land-use constraints. These exclusion criteria were digitalized thanks to GIS-supported methods and the land areas thus obtained subtracted from the surface area of the state.

The remaining area was then labelled ´§19 zones´ according to the relevant clause of the Lower Austrian Spatial Planning Act that deals with wind power generation. In contrast to other Austrian states, which had adopted ´suitable zones´ (Burgenland) or ´priority zones´ (Styria), the state of Lower Austria chose a neutral label for its wind energy zones. Thereby the state intended to communicate that local-level screening of indicated zone boundaries was necessary when defining the exact location of a wind park. On the other hand, a more positive framing would have demanded a stronger commitment of the state to promoting wind energy implementation in selected areas.

Planning approach: general rules and local decision-making authority

The spatial strategy within the Lower Austrian planning approach is based on three principles: the state´s 2030 wind energy target (3200 MW), the protection of wind-vulnerable types of land use, and the well-balanced distribution of wind energy zones across the different regions of Lower Austria.

The planning approach attempted to exclude controversial areas early on and unbundled what was considered consensual zones of development. Controversial areas were as follows: Alpine areas and other valued natural landscapes, bird protection areas, touristic areas, the border zone to the Czech Republic, and residential areas surrounding wind farms. As regards the last category, an essential parameter defining spatial constraints was the Lower Austrian Distance Regulation. It prescribed generic minimum distances between wind turbines and specific types of land-use. The most important was a 1200-metre wide buffer between wind turbines and residential land-use. The distance regulation created a planned industrialization of Lower Austria´s rural landscape as it steered wind turbines into green areas, on meadows and pastures, in forests, and at a safe distance of the outskirts of Lower Austrian towns and villages.

Lower Austria´s implementation strategy kept relinquishing the power to develop wind energy to local communities, since *´the overall interests have already been secured and areas unsuitable for wind energy have been excluded´* (Office of the State Government of Lower Austria, 2014b, p. 2). Wind energy zones were thus defined according to the state´s spatial planning goals and were deemed to provide the necessary framework for implementation. Municipalities retained the basic right to decide upon wind park implementation. In this way, the Lower Austrian government avoided the designation of desirable spaces which, however, is not consistent with the state´s implementation strategy: to leave project-level decisions entirely to local authorities.

Conditions before 2014: haphazard development, wind became political

Lower Austria´s wind energy sector had prospered since the beginning of the 2000s thanks to a favourable political and regulatory climate. One important driver for development was the relatively liberal location policy that gave municipalities considerable responsibility for spatial planning decisions. Wind parks provided an attractive income through the payment of compensation fees for the use of local infrastructure. Besides, a solid basis for the growth of wind power was established by the national renewable energy subsidy system.

Around 2013, however, a new attitude emerged among administrative and political actors: the notion that wind energy had reached the limits of its growth. The low-hanging fruits of available sites had been picked and haphazard development expanded into hitherto untouched landscapes. Project proposals on

fields, grasslands, and in forests, and at due distance of the populated area, were increasingly opposed by nature and wildlife protection organisations (in particular the national bird protection agency) and local residents. As wind energy became a territorial/political dispute, a plan was needed to calm things down.

Planning arena: closed circle of experts

Lower Austria´s wind energy planning arena was comprised of a closed circle of professionals in the fields of spatial and landscape planning, nature and environmental protection, energy planning, and wildlife protection. Interaction between these actors was widely reduced to knowledge exchange through written documentation or data transfer. Participating administrative actors did not actively take decisions but rather monitored whether proposed solutions were in line with state interests. Instead, the spatial planning consultant and the national bird agency exerted substantial influence on planning decisions.

Relevant implementation actors, such as active developers, community organisations, and local authorities were consulted, but they were not invited to take part in planning decisions. The operation that created wind energy zones was therefore largely executed without any interaction with the parties that would be affected by them. The main motivation was that only professionals would produce sound solutions that upheld the public interest.

Effectiveness: regional variation, industrialisation of green areas

Expert opinion differed on one question, namely whether Lower Austria´s decision to zone wind energy had promoted or hindered wind power deployment. Economic experts argued that implementation conditions had become more difficult because the §19 zones had largely reduced the available surface area and the state's commitment to implementing wind farms in the selected areas was low. Then again, other experts argued that zoned areas provided more planning security. Nevertheless, interviewed persons largely agreed that the state´s mid-term wind energy target could be met, not taking into account delays due to funding restrictions. Under present conditions, however, the overall zoned area will not suffice to reach the 2030 wind target.

Likewise, the prevention of wind turbine sprawl has not really been achieved satisfactorily. Because approved wind energy zones result from generic minimum distances, Lower Austria´s green areas continue to carry the burden of wind park growth. Residential fringes, in contrast, were generically protected from wind farms without considering the qualitative, spatial characteristics of these areas or the possibility of combining wind energy with industrial structures. Thereby, the distance rule severely constrained combination with other land uses.

As regards the social goal — creating acceptable locations for wind power generation — the findings show that §19 zones generally satisfy the interests of nature and wildlife protection, although from the perspective of the bird protection agency, a few zoned areas still presented some conflict potential. Spatial choices, however, had little influence on the attitude of the local population to wind energy in their backyards. In areas with little or no prior wind energy development, resistance is as strong today as it was before the introduction of the zoning plan. The wind energy sector therefore has not perceived any improvement in the situation. As a result of the fundamental decision — leaving municipalities to decide whether wind is approved (or not) — developers have to convince both residents and local politicians. Although this should provide for increased benefits to the local community, it has not led to an increased readiness to set up wind farms.

Drivers and barriers: long-term energy target but weak commitment

Lower Austria´s wind energy zones were dimensioned for the state´s 2030 wind energy target and therefore planned in anticipation of the long-term. This was an important driver to reach the 2020 target since it provided relatively generous zone sizes and more flexibility in location choices. Moreover, in areas where there was political willingness to implement wind farms, zoning increased competition for available sites. This triggered investment in communication processes during the planning phase of wind parks, and put the affected local authority in a favourable position to negotiate local interests, e.g. the terms of local participation and compensation measures.

On the other hand, one major deficiency of the planning approach was that it excluded land-use combinations that might be more desirable from an environmental and landscape planning perspective. The approach emerged at a time when the wind energy sector had conquered a fair part of the Lower Austrian territory. In this context, the relatively short planning phase and the confined nature of the planning arena did not provide a fundament for a more coordinated development of wind energy, e.g. to avoid haphazard siting of wind turbines.

The last hindering factor had to do with the wider implication of the ´neutral labelling´ of wind energy zones. The weak commitment of the Lower Austrian state to prioritising this type of land use within zoned areas remained a source of disappointment for developers and, in the long run, might constitute an obvious barrier to the achievement of the state´s wind energy goals.

3.3 Balancing the 'gains and losses' of wind energy: the case of East Flanders (Belgium)

Figure 27. Wind turbines next to greenhouses in the Flemish Region
Photograph by anonymous author

3.3.1 Introduction

Belgium is not abundantly endowed with renewable energy resources but has a relatively good potential for energy generation from wind and biomass. Domestic wind power capacity started to grow at the beginning of the 2000s when private investors reacted to first governmental support schemes in the form of tax rebates and investment subsidies (De Mulder, Strosse and Vermeiren, 2014). A second boost to wind energy came in 2003 when the Belgian government passed legislation to phase out nuclear energy. The law stipulated that 30 per cent of the country's nuclear capacity were to be shut down by 2015 (IEA, 2016, p.10). This goal was eventually postponed by ten years (Green, 2015), but it provoked growing concern among the country´s energy operating companies about the security of electricity supply. According to the IEA (2016, p.10), the country lacked an integrated, inter-federal energy vision defining a strategic course of action – to balance energy security, climate change goals, and the affordability of these commitments.

The above concern about regulatory certainty also applied to the renewable energy supply: although wind energy was making good progress and was an important instrument to achieve nuclear phase-out, the Belgian government had not yet adopted a target value, or a deadline, for onshore wind energy growth. By 2010, when Belgium committed to the European Union's 2020 renewable energy targets, the country´s wind energy capacity installed amounted to 733 MW (CONCERE-ENOVER, 2010). According to the Belgian National Renewable Action Plan (2010), an increase to 4320 MW would be necessary to achieve the national goal of 13 per cent renewable energy by 2020. [32] This suggested target value for wind energy, however, included offshore developments.

One factor that complicated the coordination of energy policy is closely connected to Belgium's federal composition. The country has a political and administrative structure based on the recognition of three regions: the Brussels-Capital Region, the Flemish Region and the Walloon Region. The three regional governments act at the intermediate level between national and provincial authorities and have wide-ranging powers in spatial and environmental planning. In the case of wind energy, this provided for a complex interplay of policies, legislation, and responsibilities at different governance levels.

The reconciliation of energy and spatial planning initiatives at the national level needed the combined efforts of the three Regional States, which were used to acting highly autonomously. This concerned not only spatial planning approaches to wind energy, but also other forms of legislation that promoted (or hindered) wind energy growth. For instance, the three Regions have a linked subsidy system for wind energy that compels transmission operators to buy green certificates from wind energy generators at a set price, but the targeted return on investment differs in each Region. [33]

Following this introduction to the general factors that influenced wind energy at the national level, we now turn to our case study, the province of East Flanders in the Flemish Region.

Since the national government did not provide any onshore wind energy goals, the Belgian Regions and, one administrative level below, the Belgian provinces developed plans single-handedly. This also applied to East Flanders. In 2010, the province took the initiative to consider wind energy from a spatial planning point of view and adopted a strategic plan that defined strategic implementation areas. The chosen areas only had an indicative status, but in subsequent years, East Flanders was to work out formally binding zones for wind energy. These zones were to create implementation security for the agreed 2020 provincial wind

32 In 2010, the country committed to the European 20-20-20 targets by adopting a share of 13 per cent renewable energy (CONCERE-EROVER, 2010).
33 Except for offshore wind energy development, which is governed by the state.

energy target while valued landscapes would be safeguarded from wind turbine blight.

Unfortunately, while East Flanders was making preparations to zone wind energy, at the level of the Flemish Region spatial planning measures went into the opposite direction. The Region started to remove legal barriers that had constrained wind energy projects at desired (from a Flemish point of view) locations. The change in Flemish legislation eased the combination of wind parks with agricultural land use, and gave offence to East Flanders: it conflicted with provincial plans to protect remaining polder landscapes from wind turbines.

While East Flanders wished to avoid wind farms in rural surroundings, the Flemish Region wished to facilitate development nearby transport infrastructure, in areas that were often used for agriculture. The new rule drastically increased the opportunities for wind energy development and, in consequence, wind power became a point of contention within regional and provincial spatial planning.

Having presented the main factors that set the stage for the East Flanders planning approach to wind energy, the following sections will turn to the evidence gained from the case study. The first part (Section 3.3.2) will present the results of the document analysis and interviews as regards economic, territorial, and social factors. The second part (Section 3.3.3) will focus on the actors involved in wind energy planning and implementation in East Flanders: their motives and competences, and their modes of interaction during the decision-making process. The third part (Section 3.3.4) will summarize and explain the set of rules, or planning decisions, within the East Flanders planning approach. The fourth part (Section 3.3.5) will then reflect on the effectiveness of wind energy implementation. After summarizing the main findings of the analysis, the East Flanders case study chapter will end with conclusions regarding this case study.

3.3.2 Conditions

This subsection identifies those factors that had a substantial influence on the East Flanders planning approach to wind energy. We start with an interpretation of the East Flanders ‘timeline’ for wind energy planning and implementation (Fig. 28). The timeline nails down relevant periods of decision-making (planning phases) during the planning process and relates these phases to wind energy deployment and goals. The aim is to sketch general implementation trends during (and after) the different spatial planning phases, with an outlook towards 2020. The interdependencies between planning decisions and implementation patterns will be discussed in greater detail in Subsection 3.3.5.

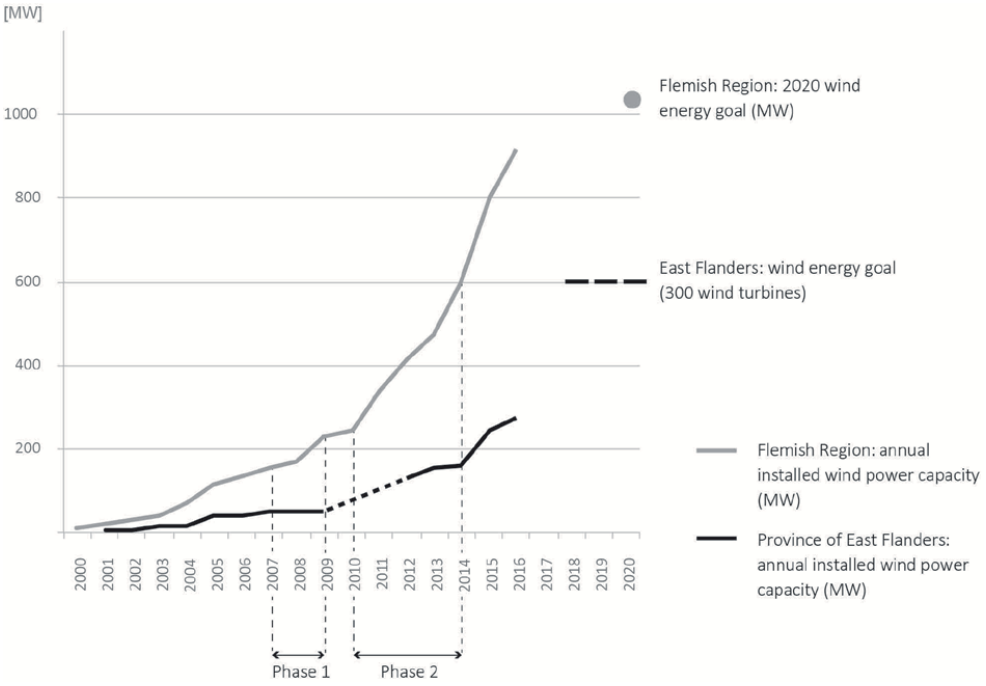

Figure 28. Wind energy growth and planning phases in East Flanders
Figure by the author, wind energy data*: Callens, 2015; VWEA 2013; 2014; 2015; 2017
Flemish wind energy target: estimation by van Noordt, 2015
*It was unfortunately not possible to obtain wind energy data for East Flanders in the period 2010-2011

Phase 1, 2007-2009: From general rules to implementation areas
Formalized by: *Addendum aan het PRS: Provinciaal Beleidskader Windturbines* (2009)
Phase 2, 2010-2014: Earmarking land for wind energy
Formalized by: Provincial Implementation Plans for wind energy for the Maldegem-Eeklo and E40-Aalter-Aalst area (2014)

Figure 28 establishes a time period of four years of decision-making for the East Flanders planning approach (2010-2014). In comparison to the other two case studies, East Flanders thus took a relatively long time to agree on zones for wind energy. Information gained through document analysis reveals that, during those four years of planning, there were several decision-making phases:

- a phase of analysis and preliminary planning (roughly until 2012),
- a preliminary design phase for the identification of zones (ended in 2013),
- a phase of political approval for the selected plans (ended in 2014).

The wind power policy of East Flanders started to be implemented in 2014, when the zones were officially approved by the provincial government.

From 2007 to 2009, a second plan-making exercise took place: it concerned the provincial strategic spatial policy plan regarding wind turbines: the *Addendum aan het PRS, Provinciaal Beleidskader Windturbines* (2009, *PRS Addendum* for short). The *PRS Addendum* is a policy that complemented the East Flanders Spatial Structure Plan. It stipulates basic spatial requirements for the approval of wind energy projects.

If we compare these two main planning phases with the annual increase in installed wind energy capacity, we can see that implementation in East Flanders has not really taken off so far. During the second planning phase, the wind energy growth rate in East Flanders slowed down. After 2014, when planning decisions came into effect, there was a short-term increase in the growth rate which slowed down again in subsequent years. By 2016, some 40 per cent of the provincial target had been met. The Flemish Region, in comparison, experienced a steady and intensifying growth after 2009. By 2016, it had achieved 95 per cent of its target.

There is, however, a difference concerning the parameters that defined the wind energy targets of the region and province. While the East Flanders target is an absolute value (300 WT) and not related to any specific (agreed) period of implementation, the Flemish target is expressed as a desired annual increase in wind energy of 80 MW until 2020.

3.3.2.1 Aggregated results of document analysis: developments in spatial and energy planning in the Flemish Region and East Flanders before 2014

Context of the Flemish Region

In 2009, time was ripe for intensifying renewable energy growth in the Flemish Region. On the one hand, the Flemish government (2009b) had announced its intention to implement a major part of the Belgian 2020 renewable energy target. On the other hand, the long-term vision *Vlaanderen in Actie* (ViA) aimed to cover most of the Flemish energy demand through domestic green sources by 2050 (Flemish Government, 2009a). To implement the ViA vision, Flemish renewable energy resources were to be used to the maximum extent possible (De Mulder, Strosse and Vermeiren, 2014, p. 73).

These two Flemish policies laid down the ambition to implement renewable energy, but — similarly to the discussion at national level — exact amounts, or shares, of specific sources remained unclear until 2013. By then, the Flemish Energy Agency[34] (VEA) had presented development options for the production of green electricity. The assessment contained targets for various energy sources that were adopted by the Flemish government (2014a) later on. The specified target for

34 Government institution tasked with the execution of Flemish energy policy.

wind energy was an annual increase of 80 MW installed capacity until 2020. This correlates with an estimated (total) volume of 1,000 MW (Flemish Government, 2014b).

While the Flemish Region was relatively late in specifying targets from an energy perspective, it did provide an early, long-lasting strategy in spatial planning. In 2009, the regional spatial planning policy for wind energy was framed by two pieces of legislation:

- The VCRO *Vlaamse Codex Ruimtelijke Ordening* (Flemish Spatial Planning Act), which provided the legal basis for the construction of wind turbines.
- The *Omzendbrief Windenergie* (circular letter on wind energy, or ´wind letter´) of 2006. A wind letter is a periodic memorandum by the regional government to lower-tier authorities that summarizes the spatial planning requirements for the approval of wind energy projects.

The wind letter was a less formal instrument than the VCRO, but it established an integrated, regional approach to wind energy deployment. It framed the conditions under which new developments would be accepted from an urban and regional planning point of view.

The principle underlying the 2006 wind letter policy was to site wind energy near urban areas and other large-scale built environments. The wind letter then prescribed the preconditions (such as health and safety standards, and land-use combinations) that would facilitate the construction of wind turbines in these kinds of surroundings. The following interview quote expresses the basic spatial planning principle in a nutshell:

> *The basic principle was: `We need to cluster together with existing infrastructure, with existing urban cores´. And basically, there is a logic in this kind of planning. On the other hand, if you place wind turbines close to people, you are going to have trouble.* (Expert 20, economy, 2016)

The above-mentioned 'trouble' connected with the wind letter requirements will be discussed later in greater detail. For now, it is important to note that the goal of bundling wind energy with built-up areas has been pursued for a very long time or, to be precise, since 2000, when large-scale wind energy deployment had just begun. The wind letter guidelines imposed then can be interpreted as an early response to the grassroots of the Flemish wind energy sector — a growing amount of initiatives were addressing project proposals to landowners and municipalities.

The rationale of the first wind letter (Flemish Government, 2000) was that wind energy not only had environmental impacts (e.g. noise emissions, shadow flicker), but also cultural, economic, aesthetic, and social impacts. The wind letter therefore connected wind energy deployment to the more integrated spatial policy of the 1997 *Ruimtelijk Structuurplan Vlaanderen* (Flemish Structure Plan or RSV). The guiding principle of the RSV is the strategy of *gedeconcentreerde*

bundeling (dispersed clustering) to protect remaining, ´untouched´ green areas in the densely populated Flemish Region. Urban or industrial development was to be bundled with the ´cores´ of rural areas and the fringes of towns.

The wind letter followed the course set by the RSV and applied similar planning principles to the deployment of wind turbines:

> By clustering wind turbines as much as possible, the preservation of the remaining open space in the highly urbanized Flanders must be guaranteed. It is therefore preferable to carry out wind power generation through a clustering of wind turbines [...]. (Flemish Government, 2000)

The clustering principle was operationalised by combining wind energy and urban infrastructure: preferably port areas and industrial areas and, as a second option: main transport corridors (roads, railway lines) and waterways. In addition, the wind letter set up an interdepartmental working group to advise on permit-giving (lower-tier) authorities and project initiatives.

In 2006, an updated wind letter then paid more attention to agricultural areas alongside transport infrastructure:

> Some locations are suitable for siting wind turbines [...], but are inadmissible because there is a legal incompatibility between the allocation of wind turbines and the designated land use according to the ordinance plan (regional plan, special plan for construction, spatial implementation plan). One might here think of, for example, agricultural areas. (Flemish Government, 2006, p. 16)

Hitherto development on these areas had largely been prevented because agricultural land fell under the protection regulations of the RSV. Since these regulations also covered areas in close vicinity to transport infrastructure, the Flemish wind energy sector reacted disapprovingly:

> *We were told ´well, you have to cluster with existing infrastructure, mainly with transport infrastructure´. But what often lies next to transport infrastructure is agricultural land. And then, if we were told ´well, it cannot be in agricultural areas´, then you actually could not use the strips of land along motorways. (Expert 20, economy, 2016)*

In the following years, the Flemish Region therefore systematically weakened legal barriers to exploiting wind energy on agricultural land. At first, *gewestelijke ruimtelijke uitvoeringsplannen* (regional implementation plans or GRUPs) overruled protected land. Between 2003 and 2009, four GRUPs mapped out locations for wind energy in agricultural areas (De Mulder, Strosse and Vermeiren, 2014). Two of these plans fell on the territory of the province of East Flanders. In 2009, the time-consuming effort to prepare GRUPs was replaced by a uniform rule called, in Flemish professional jargon, *clichering*. The legal basis for *clichering* was spelt out in the VCRO.

Energy and spatial policy in East Flanders

Around the same time that the 2006 wind letter modified the rules for wind energy siting, East Flanders decided to draft a comprehensive approach single-handedly. This approach was the *PRS Addendum* of 2009. One motive was that the provincial environmental policy plan called for a clear location policy regarding wind energy. The plan argued that there was a need for a long-term vision, and this vision should be a positive approach fostering wind power growth and treating wind turbines as a new element in the landscape of East Flanders.

A second motive was that the Flemish rules concerning the authorization of land for wind energy projects raised question marks for lower authorities. For example, it remained rather unclear which administrative level (regional, provincial or local) should take the initiative to carry out the permit procedure. In this regard, East Flanders (2009) observed that wind letter stipulations were rather vague with respect to the authority that should issue implementation plans, in particular, whether Flemish Region or province, but also whether province or local authority. In addition, permit-related activities were lawful at all three governance levels, which resulted in, according to the province, 'a wait-and-see attitude' among the affected authorities and insecure planning conditions for developers.

The *PRS Addendum* addressed these problems and suggested informal guidelines for the delimitation of power. But it also intended to promote East Flanders' interests during the wider application of the Flemish wind letter policy. Thus, it prioritised an approach that should lead to zoned areas for wind energy in selected parts of the province. The identified implementation areas had an indicative status, but the policy contained an outlook (course of action) for the coming years. Precise areas zoned for wind energy were to be designated in stages, some sites earlier than others. Furthermore, the Addendum policy announced the task of defining wind energy goals for the potential implementation locations.

The Addendum also framed tasks that were a provincial planning concern (rather than a Flemish or local concern). One was the task of 'coordination of initiatives at municipal level'. In this way, the province intended to actively influence local decision-making regarding wind energy development. The main motivation came from the observation that wind energy was increasingly becoming a social challenge in planning:

> Besides searching for suitable locations, there is currently an additional issue that is of major importance: strong competition between various developers within suitable areas, and the problem of the distribution of the benefits and the burdens (who enjoys the benefits of a wind energy project?). (Province of East Flanders, 2009, p. 7)

The above-mentioned problems could not be solved by applying classical, technical planning methods (found in urban design or land-use planning). The province called for additional tools to address the social challenge of wind turbines because '*they have a huge spatial impact*'. This would help to overcome the vicious circle of

splintered ground requirements and vanishing support. The goal was to facilitate (compact) implementation through zoning, but in combination with an approach that would build up local support. One key to success was, according to the province, the fair distribution of the '*lasten en lusten*' (gains and losses) of wind energy.

3.3.2.2 Aggregated results of interviews: conditions influencing the East Flanders planning approach to wind energy

While the previous part of this section concentrated on evidence gained through document analysis, this part is based on expert interview material. Table 11 (p. 158) summarizes eleven factors that structured action in the East Flanders wind energy arena (Section 3.2.3). As with the other case studies, concurring statements were assigned to territorial, social, or economic conditions. Occasionally, after 2014 conditions changed during the implementation phase. If this was the case, trends and events that induced changes in conditions are described in the right column of the table.

Table 11. Conditions influencing the East Flanders planning approach to wind power
Source: aggregated results of interviews

Factors influencing wind energy deployment in East Flanders (before 2014)			Tendencies and events (after 2014)
Territorial	Biophysical attributes	Wind energy deployment concentrates on port areas, industrial areas and alongside waterways	Increasing development on agricultural areas next to transport infrastructure
	Rules and regulations	Flemish *clichering* regulation facilitates wind turbine siting on agricultural land next to transport infrastructure	none
		Flemish Wind Letter of 2006 influences territorial spread of projects by providing the spatial principles of 'clustering' wind parks and 'bundling' with built structures	none
		The Flemish Region is the competent authority for wind energy, but provinces can influence decision-making by taking initiatives such as implementation plans.	none
		Absolute values concerning impacts on nature and built environment regulate the distance between wind turbines and other functions. The most influential are noise and safety norms	none
Social	Community aspects	An increasing number of operators apply for vacant plots on agricultural land. The wind energy sector advises against bundling with residential cores	none
		Chasm between overall and local support for wind energy: municipalities and residents lodge complaints against wind energy projects	none
	Shared values	The spatial principle of ´dispersed clustering´ as formalized in the RSV Flanders Spatial Development Plan	none
Economic	Market aspects	The Belgian regions with sea ports are most attractive for wind energy development	none
		Medium-sized Belgium companies dominate wind energy exploitation. Globally active firms enter the market	Companies pursue increasingly different business models. Renewable energy corporations leave the Wind Energy Association
	Rules and regulations	Generous green certificates together with a drop in deployment costs lead to overcompensation. After 2012, support levels are reduced	A reform of the subsidy policy creates stable and predictable support

The information in the table allows us to draw some general conclusions. There is a high degree of consensus about cited territorial and social factors (in particular action taken by the wind energy sector and local population). In addition, territorial factors were generally more stable than social or economic ones. The following subsections will discuss the information in the table in greater detail and relate cited experiences / opinions to collected document information.

Territorial conditions

Wind energy in East Flanders is mainly concentrated in harbour areas such as the *Waaslandhaven* and the *Ghentse kanaalzone*. Development in other areas has been more difficult. East Flanders, one of the most densely populated areas in the Flemish Region, was strongly affected by urban sprawl during the last century. Splintered residential development therefore inevitably constitutes a major constraint for wind turbines outside harbour areas.

Another important factor was the distribution of the power to approve wind energy projects between different governance levels. The Flemish government is the competent authority for wind energy development, but provinces may exert some influence by taking the (first) initiative to site wind turbines. The conventional formats of provincial planning initiatives are implementation plans (PRUPs) that have to be sanctioned by the Flemish government. Another, more informal way to influence development is to create guidelines that must be taken into account when issuing a permit for wind turbines. In this regard, the main spatial requirements for the approval of wind energy projects are published by the Flemish wind letter, but provinces may introduce additional rules that translate higher-tier stipulations to a local level.

Another main regulatory aspect is the VCRO Flemish Spatial Planning Act. In the VCRO, the Flemish government removed restrictions concerning wind turbines on agricultural land by introducing *clichering* (technical term literally meaning: stereotypisation). This is a uniform rule that allows the combination of wind energy with agriculture, even though this rule conflicts with some stipulations in the RSV Flemish Spatial Structure Plan. Beforehand, a time-consuming procedure was necessary to combine wind energy with agricultural land use:

> *GRUPs did get issued for wind energy in agricultural areas. But the procedure was slow and laborious. Thus, it was decided to solve the problem with the ´clichering´.* (Expert 12, mediators, 2016)

This *clichering* rule could be applied to ‘any’ agricultural land but this had to be motivated according to the wind letter principle of ‘deconcentrated bundling’ (see Section 3.3.2.1, p. 153).

The last territorial factor concerns the minimum distance between wind turbines and dwellings. Distances were regulated by health and safety norms (noise, shadow) of the Flemish wind letter (2006) and the *VLAREM* (Flemish decree on environmental licensing) of 2011. What is important to note is that these regulations provided for an average buffer of 300 metres. Thus wind turbines in the Flemish Region could theoretically stand in relatively close vicinity to residential areas.

Social factors

Wind energy operators increasingly competed for plots on agricultural land. These were preferred to the alternative option: siting wind turbines in fringe areas of cities and villages. In the urban fringes, investment was more problematical because operators were more exposed to the complaints of residents:

> *In Flanders, areas where wind parks are allowed are also densely populated. Residential cores… then we would rather prefer industrial areas. Wind parks are also being developed close to residential areas in compliance with the regulations. But since more people are affected, the creation of public support is more difficult.* (Expert 20, economy, 2016)

On the other hand, the preference for rural locations increased competition for sites, leading to sometimes uncoordinated project submissions for the same location. Competing developers usually secured land property rights and submitted applications according to the expectation of ´first come, first serve'. Once a wind turbine was approved, the neighbouring (rival) plot could no longer be developed. In a competitive setting, coordination of plans was not self-evident.

At the same time, low local support for wind energy increasingly became a spatial planning issue. In 2011, a survey by the VEA Flemish Energy Agency (2011) concluded that generally there was a lot of public support for wind energy. This stood in strong contrast to the fact that projects were increasingly being delayed by court procedures. Interviewed experts refer to a chasm between overall and local support that calls for an 'effective narrative' (see second quote below) for affected local stakeholders:

> *The whole support narrative developed from our observation that the usual procedure (defining locations) was not effective anymore with the residents without a convincing narrative.* (Expert 13, administration, 2016)

In the particular case of East Flanders, the VEA survey (2011) discerned a significantly lower public acceptance level of wind energy on agricultural land or on the boundaries of protected landscapes than in other Flemish provinces. This fits in with the observation that the RSV long-term spatial vision of preserving landscapes through *gedeconcentreerde bundeling* is a value that is widely shared by the public.

Economic conditions

Interviewed experts agreed that, from an economic point of view, the harbour areas in the north-western part of East Flanders were the most attractive for development. They had been prioritised by the Flemish wind letter policy, but they also enjoyed very good wind conditions. Until 2009, therefore, most wind turbines were built in industrial areas. The *clichering* rule then expanded the opportunities for implementing wind parks. By 2012, East Flanders had 153 MW installed wind energy capacity, which is almost three times the total capacity installed in 2009 (53 MW). Afterwards, growth more or less stagnated until 2014.

During this period of wind energy growth, active developers or operators became more diverse with respect to their business models and scopes. Pioneering Belgian developers grew into medium-sized companies and international companies of French origin started entering the market. Nevertheless, Belgian firms still dominated the sector.[35] In addition, the profiles of companies became increasingly different. Some were private and profit-oriented, some were semi-public companies with municipal shareholders, others pursued a cooperative business model.

The final influential factor was wind power subsidies. The national incentive programme is a green certificate system[36] whose exact terms concerning duration and support levels differ for each Regional State. According to one expert, this support scheme provided relatively stable conditions for investment. This opinion was confirmed by the IEA (Bouckaert et al., 2015), with the added information that green certificates were rather too generous until 2012: they led to overcompensation and increased distribution tariffs for electricity. Consequently, the Flemish Region reduced support levels, which caused a slightly lower annual rate of increase of installed capacity from 2012 to 2013.

3.3.3 Planning Arena

In its *PRS Addendum*, East Flanders announced that it would specify implementation goals and define earmarked land within a period of four years, between 2010 and 2014. The desired output of the planning arena included: improved spatial stipulations, a provincial wind energy target, and *PRUPs* implementation plans for two (out of five) potential locations.

35 According to expert opinion, large-scale exploitation in the Flemish Region is mostly in the hands of three companies that are also energy suppliers. Besides, there is a number of smaller businesses, among which two renewable energy cooperatives.

36 Tradable green certificates facilitate a support strategy that is based on a quota obligation for consumers, retailers or suppliers to source a certain percentage of their energy from renewable energy (De Jager et al., 2011). Wind energy producers can sell green certificates, which prove the renewable source of the electricity. Suppliers prove that they meet their obligation by buying these certificates.

As described in the previous subsection, East Flanders, though highly active in the planning field, was not the main authority from a formal point of view. The Flemish Region had to approve East Flanders' plans to zone areas for wind energy. In this context, the unleashing of wind turbines on agricultural land by the *clichering* rule became a point of contention in spatial planning. While Flanders wished to spur development alongside transport infrastructure, East Flanders tried to protect the rural character of the adjoining landscape. In consequence, regional and supraregional planning goals were drifting apart.

3.3.3.1 Aggregated results of interviews: participants of the East Flanders planning and implementation arena

Table 12 (p. 163) summarizes interview findings about the actors who were involved in the planning and implementation of wind energy policy. In this regard, one specific feature of the East Flanders arena is that it has to deal with four administrative levels of planning: national, Regional State, province, and municipalities. Furthermore, this overview differentiates actors who occupied a central (core) position.

The core actors were spatial planning institutions at the provincial and Flemish levels, such as the East Flanders directorate for spatial planning, the Flemish department for spatial planning, and the Flemish department for environment, nature and energy (LNE). In addition, various other government departments contributed to East Flanders' planning decisions, although to a lesser extent than the above-mentioned parties.

Other actors were of a more intermediary nature. They included task groups that operated between Regional State and province, or between province and local actors. These were, for instance, the Flemish *task group wind* and the *East Flanders energy landscape* programme. In addition, private consultancies took up intermediary positions. These were companies in the fields of landscape design, spatial planning, and energy economics.

Highly important implementation actors included the VWEA/ODE associations, but also, closer to the local level, community associations, landowners, politicians, and several wind energy developers[37].

37 In the opinions of interviewed experts, two types of market players must be differentiated: energy corporations and commercial (traditional) wind energy operators.

Table 12. Planning and implementation actors in East Flanders, 2009-2014
Source: aggregated results of interviews

organisation	position				policy document				
	actor dimension	spatial-organisational level	planning	implementation	Wind Letter (2006)	PRS Addendum (2009)	Beleidsnota energie Vlaanderen (2014)	Wind Letter (2014)	ME / E40 implementation plans (2014)
Belgian authority for defence and air traffic	AD	macro	x						x
RWO Flemish department for spatial planning	AD	macro	x		x		x	x	x
LNE Flemish department for environment, nature and	AD	macro	x		x		x	x	x
IWWG interdepartmental task group for wind	AD /I	macro		x					
Flemish government	PO	macro	x	x	x	x	x	x	x
ODE /VWEA wind energy association	EC	macro	x	x	x	x	x	x	x
RESCOOP association for renewable energy	EC/ CI	macro		x					x
Spatial planning consultancy	IM	macro	x						x
Landscape architects	IM	macro	x						x
VITO European research and technology organisation	IM	macro	x				x		
Energy consultancy	IM	macro	x						x
Province East Flanders, department of spatial planning	AD	meso	x	x		x			x
Project team Oost-Vlaanderen Energielandschap	AD /I	meso	x	x					x

organisation	position				policy document				
	actor dimension	spatial-organisational level	planning	implementation	Wind Letter (2006)	PRS Addendum (2009)	Beleidsnota energie Vlaanderen (2014)	Wind Letter (2014)	ME / E40 implementation plans (2014)
PROCORO provincial advisory board for spatial planning	AD /I	meso	x						x
East Flanders provincial government	PO	meso	x						x
Municipal authorities	AD	micro		x					
Municipal councils	PO	micro		x					
Wind energy operators with ground claims	EC	micro	x	x					x
Community task groups	CI	micro	x	x					x
Local residents affected by development	CI	micro		x					
Farmers and landowners	CI	micro		x					

Legend
Planning core actor

Acronyms
AD administration
CI civil society
EC economy
IM intermediary
PO politics

3.3.3.2 Actors and their positions

Flemish authorities

Among Flemish authorities, the department for spatial planning (*Ruimte Vlaanderen*) and the department for environment, nature and energy (*Departement Leefmilieu, Natuur en Energie*) held the main responsibility for spatial decisions related to wind energy. The Flemish government gradually set the course towards an energy-oriented policy. Formal barriers that constrained implementation (according to wind letter principles) had to be removed. In other words, the sectoral goal — generating ´MWs´ — acquired growing importance.

The tipping point came with the *clichering* rule. The rule placed the interests of the wind energy sector above those of landscape preservation, although this was a core principle in Flemish spatial planning. It was argued that the rule concerned potential sites that were already contaminated by traffic (a notion that was in line with wind letter principles) and that wind power generation did not exclude agricultural land use.

Interdepartmental task group on wind

The interdepartmental task group on wind (IWWG) was composed of experts from the Flemish government and administration as well as representatives of established, non-governmental organisations that lobbied for environmental, energy-related, and economic interests. The task group functioned as a kind of governmental helpdesk for wind energy initiatives. These initiatives ranged from project proposals by private developers to implementation plans by local or provincial authorities. The request for approval by the IWWG had to be submitted prior to the official application for approval of a project. This was meant to create a win-win situation for developer and permit-giving authority.

Consultation was important for wind energy initiatives because the IWWG had far-reaching powers in facilitating implementation. It could suggest solutions to do away with permit-related obstacles and could impose context-specific requirements for the implementation of plans/projects. The task group therefore exerted substantial influence on development where ´difficult´ locations were concerned.[38] Still, a positive recommendation was not formally binding: several large-scale projects that received a positive recommendation have been in a state of suspension since because of a lack of coordination between project developers, administrative bodies, and permit-giving authorities.

38 Hitherto experience had showed that projects on industrial lands were more likely to receive a positive recommendation than those on agricultural locations (ODE, 2017a).

East Flanders authorities

The provincial spatial planning directorate (*Directie Ruimte*) played a central role in the East Flanders planning process. It organised the decision-making process for the East Flanders wind energy zones, part of which consisted in regular exchange with political actors such as the provincial government and affected local politicians. The spatial planning directorate had previously developed the *PRS Addendum* policy in collaboration with the provincial environment directorate and also participated in the IWWG.

The authorities of East Flanders had several motives to earmark land for wind energy. The first one was to exert more influence on location decisions. The province had the official power to deliver environmental permits for the construction of wind parks,[39] but planning decisions were dominated by the Flemish wind letter rules. These were, according to the province, 'unclear'. The East Flanders planning approach therefore sought to overcome the main shortcomings of the 2006 wind letter. One of these shortcomings was that developments did not get off the ground:

> *Because of the wind letter, relatively few wind turbines were installed. Therefore, the province started the initiative 'let's steer it for a while'. On the one hand, we wanted clarification, but on the other hand we wanted more wind turbines. So the idea was: we will do it, and we will steer it (project-based track).* (Expert 15, administration, 2016)

Another motive was related to the introduction of the *clichering* rule. The Flemish Region was trying to create more room for wind energy in a way that was far from consistent with provincial plans. The *PRS Addendum* adopted the planning principle of 'concentration and contrast', which can be described as a harmonious spatial orchestration of compact wind parks and turbine-free intermediate areas.

The third motive was connected with the social/economic goal of facilitating the construction of wind parks in a way that would create added value for those who suffered from the impacts of wind turbines. Flemish stipulations leave market players free to offer local benefits. East Flanders, in contrast, defines local resistance as a problem that must be addressed through intermunicipal cooperation and participative planning. These are usually core issues within provincial planning.

39 Operators of large wind turbines have to apply for an urban planning permit and an environmental permit. The procedure for the urban planning permit is handled by the Flemish Region. If the capacity is above 5 MW, then the environmental permit is issued by the provincial authority, and if it is under 5 MW by local authority.

Flemish Wind Energy Association

The VWEA Flemish association for wind energy (*Vlaamse windenergie associatie*) is part of a wider organisation ODE, that promotes all forms of renewable energy. Members of VWEA are all kinds of market players involved in the development of wind parks and operation of wind turbines, such as project developers, manufacturers, consultants, or suppliers. The organisation has a steering committee that publishes position papers with a political purpose. One main concern is to lobby for the interests of project developers.

Naturally, VWEA pleaded for more room for wind energy. In this regard, the sector organisation had successfully lobbied to launch developments on vacant plots next to transport infrastructure. VWEA also argued for more ambitious (onshore) wind energy goals (1500 MW installed capacity) and published reactions to the workings of the Flemish wind letter policy. In this respect, the VWEA advised against 'bundling' wind parks and urban fringe areas:

> *Connecting to existing infrastructure is not a problem for us, but the wind letter must not force us to cluster wind turbines nearby residential areas. Thus, clustering with transport infrastructure and industrial areas is fine, but not with residential areas. That was a recommendation we had made to the Flemish minister. (Expert 20, economy, 2016)*

As regards the East Flanders wind energy plans, the sector organisation was positively inclined towards a strengthened wind energy goal, but the prospect of a provincial policy in addition to the Flemish policy was not really what developers were waiting for:

> *On top of existing Flemish regulations the province wants to decide 'what kind of locations are preferable'. However, the province is not entitled — what they have promised their citizens more or less — to say ´wind turbines will come on this location but not on that location´. In fact, they are not the competent authority to do so. (Expert 20, economy, 2016)*

Consultants

In the opinion of experts, consultant work by different actors had a major influence on East Flanders' planning decisions. The first concerns the ODE sector organisation, which executed an assessment of renewable energy resources. A second technical consultant performed the strategic environmental assessment (SEA) for the planned wind energy zones. The methods used by these studies and the knowledge they generated were then used to define the total wind energy potential of suitable implementation locations.

Next to the actors who provided technical knowledge, landscape planning offices drafted optional plans with zones for wind turbines. These plans started from a perspective of landscape aesthetics and were then submitted to the local parties concerned (developers, residents).

In addition, the VWEA sector organisation for wind energy, as well as experts from various sectoral departments of the Flemish/Belgian government, regularly

provided advice during the planning phase. A major provincial actor that had an advisory role was PROCORO, the provincial advisory board for spatial planning.

Municipalities

Often, Flemish municipalities were not positively inclined towards wind energy, but from a formal point of view, had little say in this matter. Developments of more than 5 MW (usually more than one wind turbine) had to be approved by authorities at a higher governance level. But being close to residents and their interests, municipalities could exert influence by joining the local debate about wind energy:

> *We now see that not only residents are objecting to plans, but also many municipalities are objecting. It is somewhat strange that the Flemish government has the ambition to site many wind turbines, while the local government is taking action against wind turbines.* (Expert 12, mediators, 2016)

Municipalities needed clear instructions, e.g. when a project proposal had to be assessed. The discrepancies between Flemish and East Flemish rules, as well as the criticised ´unclear´ delimitation of power (see Section 3.3.2, p. 151) created insufficient guidance in this respect.

Residents

The public announcement of the East Flanders potential implementation areas caused quite a stir among the residents of East Flanders. Those who lived in potential locations feared that wind turbines would be placed everywhere within the selected areas. Some actors within civil society were, however, less negatively disposed towards wind energy in their backyards. These were, for example, farmers or other landowners who saw an opportunity to increase their incomes by leasing land to wind park operators.

Local residents played a central role in the East Flanders planning process because they had a say *during* (and not at the very end) of the planning phase. This is an important particularity of East Flanders, in comparison to the planning processes in South Holland and Lower Austria. Residents could state their planning preferences by means of a community poll. Moreover, some individuals could actively participate in local land-use decisions. These were the members of *actiecommitees* (community task groups), who were invited by the province to lobby for the interests of affected residents.

Active developers

Active developers were those who had claimed plots for development by entering into agreements with landowners (*opstalcontracten)* in East Flanders regarding potential implementation locations. The installation of wind turbines demanded a

timely setting aside from suitable sites. This could be done by signing preliminary agreements with local landowners. If several developers were active in the same area (which was usually the case), time was of the essence for the successful realization of a project.

Active developers were free to cooperate with the province by putting their cards (i.e. ground requirements) on the table and to negotiate their interests during the planning process. By doing so, they could reckon on provincial support, but they had to delay their application until provincial plans were settled enough. The alternative was to appeal directly for approval to the higher-tier authority of the Flemish Region, thereby risking the opposition of the province.

3.3.3.3 Interactions between actors

Two important topics had to be fought out within the East Flanders planning and implementation arena. The first topic was the identification of wind energy zones in potential implementation areas. The second concerned the balancing of the 'gains and losses' of wind parks. These two topics — the 'planning narrative' and a 'support narrative' — were elaborated in a parallel process:

> *Over the past three years we have been developing wind energy by combining a plan-based approach on the one hand and a project-based approach on the other hand. The latter being based on public participation and public support, facilitated by the energy landscape programme.* (Expert 15, administration, 2016)

The expression *narrative* might be unusual for the rather technical exercise of zoning wind energy, but decision-making in East Flanders indeed focused on the development of a good storyline for wind energy; one combining a spatial story that would support the chosen course of action to arrive at spatial decisions (*planmatig verhaal*) and a social acceptance story (*draagvlak verhaal*).

To weave the two strands of the narrative, it was necessary to experiment with practical examples. In this regard, the *Oost-Vlaanderen Energielandschap* (East Flanders energy landscape) programme, which was mentioned in the interview quote above, provided the required resources. The planning phase was a ´doing-by-learning´ process that went far beyond the formal procedure of creating PRUPs. The programme was subsidised by the Flemish government and started in 2011. The provincial spatial planning directorate was the main coordinator. Practical experience was gained from the test areas of Maldegem-Eeklo and E40-Aalter-Aalst, which were two (out of five) *PRS Addendum* potential implementation areas.

The energy landscape programme facilitated collaboration between planning actors (public authorities and consultants) and implementation actors (market and private parties, NGOs) in different ways.

One tranche of collaboration was more formal and related to communication between the spatial planning directorate and professionals. There were three layers of cooperation:

- The first layer concerned a limited circle of experts from some East Flanders and Flemish authorities (POM,[40] RWO, VEA) and the energy consultancy (ODE) that were jointly responsible for content-related decisions.
- A second layer consisted of a good deal more parties that were regularly consulted, such as the provincial departments for transport, heritage and environment, the Belgian defence and air traffic department, affected municipalities, electrical network operators, sectoral interest agencies such as the VWEA and RESCOOP and environmental organisations. Feedback was exchanged at bilateral meetings and workshops.
- The third layer concerned periodic exchange of views with political actors during the planning phase. Important intermediate steps (preliminary results) were presented to the provincial council. This again was more than the formal requirements to adopt PRUPs.

Besides the participation of experts, another tranche of collaboration centred on the participation of non-professionals in the planning process. One strand of this collaboration was to coordinate the activities of wind energy developers and facilitate local compensation. Communication with these actors again ran along several tracks. The most important were:

- bilateral meetings with market players;
- community polls;
- workshops with local stakeholders.

Creation of knowledge

Knowledge needed for planning decisions was created in phases. At the beginning, between 2010 and 2012, draft PRUPs, or zones, were worked out for the potential implementation areas of Maldegem-Eeklo (ME area) and E40-Aalter-Aalst (E40 area). This phase was dominated by studies (alternative plans) to cut down the range of locations, conducted by landscape architecture consultants (2012). The draft plans where checked by consultants and presented to the general public of East Flanders.

Local residents were asked to state their preference for one of the two presented scenarios, which in the ME area basically entailed choosing between clustered and linear development, and in the E40 area between a land-use combination with agricultural land and a mix with industrial areas. Another, even more fundamental

40 *Provinciale Ontwikkelingsmaatschappij Oost-Vlaanderen* (provincial economic development agency of East Flanders).

question was whether residents would prefer the province to pre-define zones for wind energy within the potential implementation areas or whether the exact siting decision should be left to market players. In this context, a GIS study that mapped out potential implementation areas in greater detail was presented to the public.

The preferred scenario-based plans for the ME and E40 areas were then fine-tuned during a strategic environment assessment (SEA) in 2013. The SEA also contained an estimation of how many wind turbines could be sited in theory. This was important in order to assess the possible environmental impacts of the chosen areas.

At the same time as the SEA procedure, residents and developers were actively consulted. Wind energy developers applying for land in the selected areas were invited to study the possibility of finalising plans collectively for the selected areas and to give technical advice. Community task groups that had been set up in each area were consulted about their interests. The three processes resulted in PRUPs for the ME and E40 area (2014). Furthermore, the knowledge gained during the SEA and by community task groups was used to define exclusion and high-impact areas.

The last phase of knowledge creation concentrated on defining standards for the local 'gains' that would compensate for the 'pains' resulting from wind parks. International good practice provided examples that inspired East Flanders to adopt a model of direct participation and re-investment in the direct vicinity of wind turbines. Also, a landscape study in the ME area was conducted to soften the visual impacts of wind turbines by planting trees and hedges.

3.3.3.4 Map of the East Flanders planning arena

The last part of this subsection presents the findings from interviews and document analysis in a graphic representation of the East Flanders planning and implementation arena (Fig. 29, p. 173). The figure clearly shows that the planning process was influenced by main actors at all three spatial levels:

- At the regional (macro) level, the departments of spatial planning and energy planning of the Flemish authority prescribed wind energy goals, spatial planning principles and preferred land-use combinations. Other relevant planning actors were the VWEA wind energy sector agency and consultants in energy technology, as well as the national department for military defence.
- At the provincial (meso) level, the spatial planning directorate and PROCORO (provincial advisory board) occupied outstanding positions in the planning process.

- At the local (micro) level, residents and developers were involved in the planning process as were, to a minor extent, the owners of land earmarked for potential development.

Besides the main planning actors listed above, several other parties held key positions during the planning and implementation process and stood for the vertical governance of wind power deployment:

- The IWWG took up a key position between wind energy developers, provinces, municipalities, and the Flemish authority.
- The task group of the East Flanders energy landscape programme created a platform for the exchange of knowledge between public and private professionals from all spatial levels and actors from civil society.
- The VWEA connected individual wind energy developers (market players and energy corporations) to Flemish and East Flanders authorities.
- Community task groups mediated between the provincial authority and the interests of residents, landowners and local authorities.

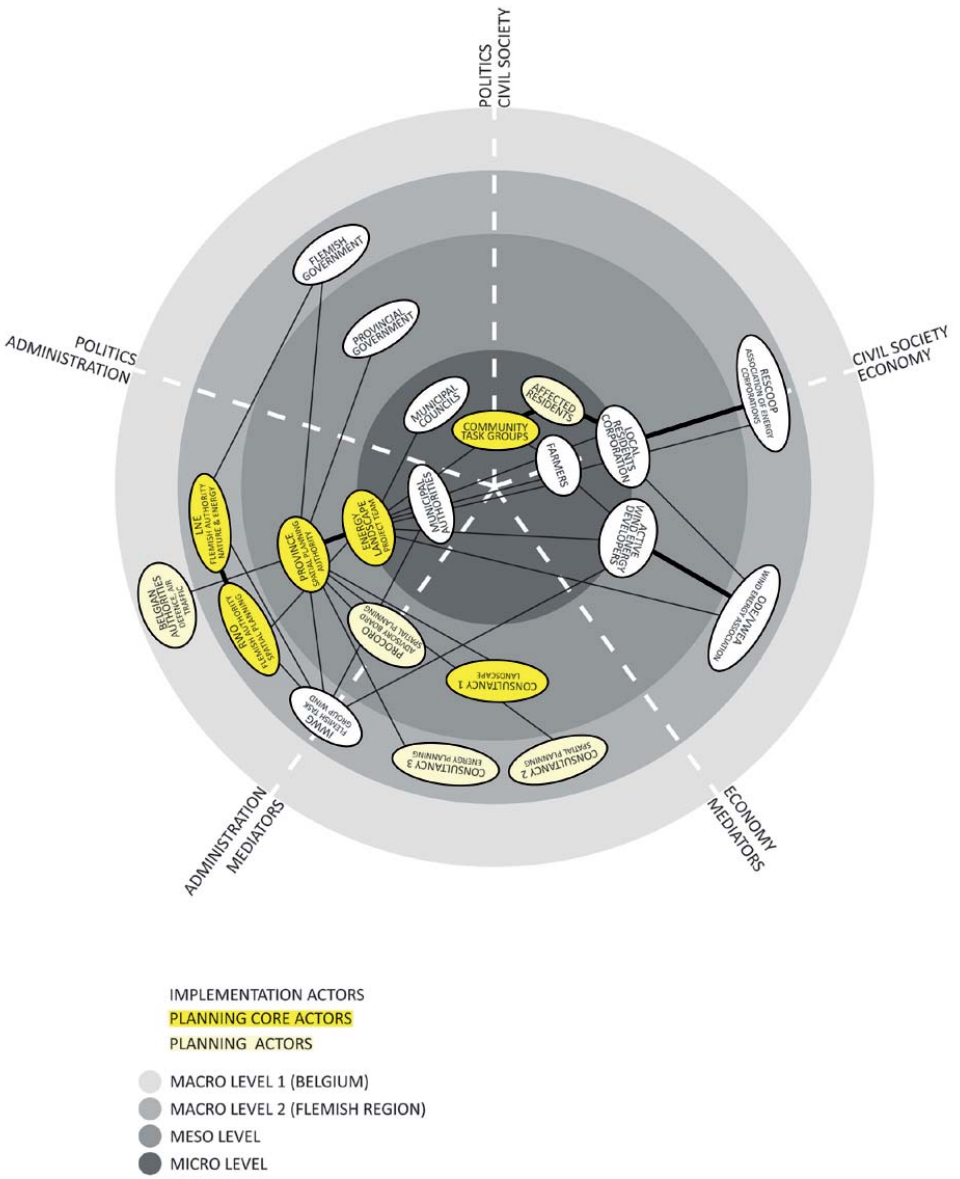

Figure 29. East Flanders wind power planning arena
Positioning of participants according to five actor dimensions and three levels of wind energy policy-making.
The black lines relate to the intensity of interactions between different participants.
Figure by the author

3.3.4 Planning Approach

The interactions between East Flanders planning actors, together with the structuring forces of external conditions, shaped the East Flanders planning approach to wind energy. The approach is manifested in various documents. It evolved from strategic spatial policy documents of the Flemish Region and the province of East Flanders, from land earmarked for wind energy development, and from provincial government notifications. The most important of these were: the Flemish *Omzendbrief Wind* and the East Flanders *PRS Addendum* (strategic documents), along with the provincial implementation plans adopted for the Maldegem-Eeklo and E40-Aalter-Aalst areas.

Each policy document or plan is composed of a variety of planning decisions. For the purpose of our analysis, these were arranged according to the levels of policy-making (macro, meso, or micro) and according to the *options available* (planning issues that were considered during the planning phase) in the East Flanders situation. As with the other two case studies, the available options have been noted down in this table to structure the last analytical step of this thesis (see Section 4.2.2, p. 198), which aims to detect congruent insights in the case studies.

Table 13 below presents the results of this exercise. Similarly to the South Holland and Lower Austria case studies, the compiled set of rules and stipulations can either relate to planning choices that determine the selection of locations (*spatial strategy*) or to choices that govern wind energy deployment on selected locations (*implementation strategy*).

Table 13. East Flanders planning approach to wind power 2014: planning decisions according to three levels of policy-making

Spatial-organisational levels		Available options	Planning decisions	Formalized in
MACRO regional level (Flanders)	Spatial strategy	T1. Concentrated / dispersed development	Criterion of *decentralised bundling* (preserving rural landscapes). Criterion of *optimalisation* (maximum use of wind).	RSV (1997), Wind Letter (2014)
		S1. Generic rules vs spatial-geographic approach	Generic rules: *clichering* allows wind energy use on agricultural land	Wind Letter (2014)
		S2. Land use constraints / combinations	Land-use combinations: port areas, industrial areas, urban fringes and alongside dominant transport infrastructures (roads, railway tracks, waterways)	Wind Letter (2014)
		S3.With/without guidelines for the set-up of wind turbines	Wind energy implementation in clusters of at least 3 turbines.	Wind Letter (2014)
	Implementation strategy	G1. Upscaling / downscaling level of decision-making	The Flemish Region may take executive action in land purchases if land requirements lead to inefficient siting of wind turbines. Wind energy initiatives that are active in the same area can be asked to synchronize their plans.	Wind Letter (2014)
		G2. Local participation and compensation	Approval authorities can take into account the efforts related to debates, public participation and other involvement of local stakeholders.	Wind Letter (2014)
MESO provincial level	spatial strategy	E1. Land requirements for energy targets: general aim vs zone-specific targets	300 wind turbines on *potential implementation areas*	PRS Addendum (2009), Klimaatplan Oost Vlaanderen (2015)
		T1. Concentrated / dispersed development	Principle of *concentration and contrast:* clustering wind turbines, wide exclusion areas in-between.	PRS Addendum (2009)
		T2. Types of zones: positive / negative / other	Positive zones are labelled as *concentration zones,* negative zones as *exclusion zones.* These are the enclosed areas that result from a minimum distance of 5km around concentration zones	Provincieraad-beslissing (2014)

Spatial-organisational levels		Available options	Planning decisions	Formalized in
MESO provincial level	spatial strategy	S1. Generic rules vs spatial-geographic approach	Spatial-geographic approach: territorial indication for potential implementation areas	PRS Addendum (2009)
		S2. Land use constraints / combinations	Land-use combinations: areas in the vicinity of large urban clusters, industrial areas, large-scale line infrastructure, tall constructions	PRS Addendum (2009)
		S2. Land use constraints / combinations	Land-use constraints*:* valuable natural areas, protected landscapes, residential areas, silence areas	PRS Addendum (2009)
		S3. Guidelines for the set-up of wind turbines	Planning principle of the *maximum use of suitable zones*: preferably clustered development	PRS Addendum (2009)
		G1. Upscaling / downscaling level of decision-making	Definition of wind energy zones by PRUPs provincial implementation plans	PRS Addendum (2009)
	implementation strategy	G2. Participation & area development	Province takes the initiative to facilitate a public debate during the implementation phase	PRS Addendum (2009)
		G2. Participation & area development	Principle of balancing 'gains and losses'	PRS Addendum (2009)
MICRO municipal / intermunicipal level	spatial strategy	E2. Limitations of zone size: minimum / maximum	Possibility to implement at least 5 wind turbines in a wind energy zone	Provincieraad-beslissing (2014)
		T1. Concentrated / dispersed development	Concentrated linear development in one large-scale location (ME area) / concentrated development in 6 clusters (E40 area)	Provincieraad-beslissing (2014)
		T2. Types of zones: positive / negative / neutral	Local compensation zones are labelled *landscape zones*	Provincieraad-beslissing (2014)
		S1. Generic rules vs spatial-geographic approach	Generic rules: a distance of 800 metres to wind turbines defines local compensation zones	Provincieraad-beslissing (2014)
		S2. Land use constraints / combinations	ME area: combination with agricultural land / transport infrastructure. E40 area: combination with industrial areas	Provincieraad-beslissing (2014)

Spatial-organisational levels		Available options	Planning decisions	Formalized in
MICRO municipal / intermunicipal level	implementation strategy	G2. Local participation and compensation	ME area: a minimum 20 per cent of direct participation plus a financial contribution by wind energy operators to a landscape fund	Provincieraad-beslissing (2013)

The information in Table 13 provides some general insights into the East Flanders planning approach to wind energy. What might immediately attract the attention of the reader is that there is a vast amount of rules and stipulations at all three levels of policy-making. Wind energy in East Flanders has obviously been handled as an object of multilevel planning: the Flemish Region imposes macro-level rules on provinces and municipalities, and the province of East Flanders then translates these rules into home-grown planning decisions. These decisions are then particularized further at the level of potential implementation areas (micro level).

The table also casts light on the focus of the East Flanders planning approach with regard to social, economic, and territorial goals. It reveals that social issues have dominated planning decisions at all three levels. For instance, desired land-use constraints and combinations were identified at each level (region, province, and implementation areas). The basic assumption is that, depending on the territorial-geographic entity one looks at, reconsideration of higher-tier rules and regulations is necessary. In other words, the answer to the question: what sites are considered suitable, or unsuitable, for wind energy largely depends on the size of the spatial unit where the question is asked. This is especially interesting considering that the Flemish *Omzendbrief Wind* already contained fairly specific requirements concerning land-use combinations and constraints.

The same observation applies to the long-listed governance requirements at each level. They range from rather general, permit-related criteria (Flemish Region) to fairly specific standards for wind energy projects (Maldegem-Eeklo area). The emphasis is twofold: to exercise more control over the layout of a wind park (efficient siting) and to facilitate local compensation for disruptive impacts. Again, both planning problems are addressed from the highest to the lowest governance level with an increasing level of detail.

3.3.4.1 Spatial strategy: combining positive and negative zones

Before describing the East Flanders spatial strategy for the deployment of wind energy, it is important to note that the earlier *PRS Addendum* rules still form an important (unchanged) part of the East Flanders planning approach.

Higher-tier land-use stipulations of the Flemish Region and provincial-level plans are closely intertwined, but there are some large differences regarding how they have been formalized. The Addendum announced, just as the Flemish wind letter had, a range of preferred land-use combinations and land-use constraints. These led to the identification of five *macro concentratiegebieden*, or potential implementation areas, for wind energy (Fig. 30).

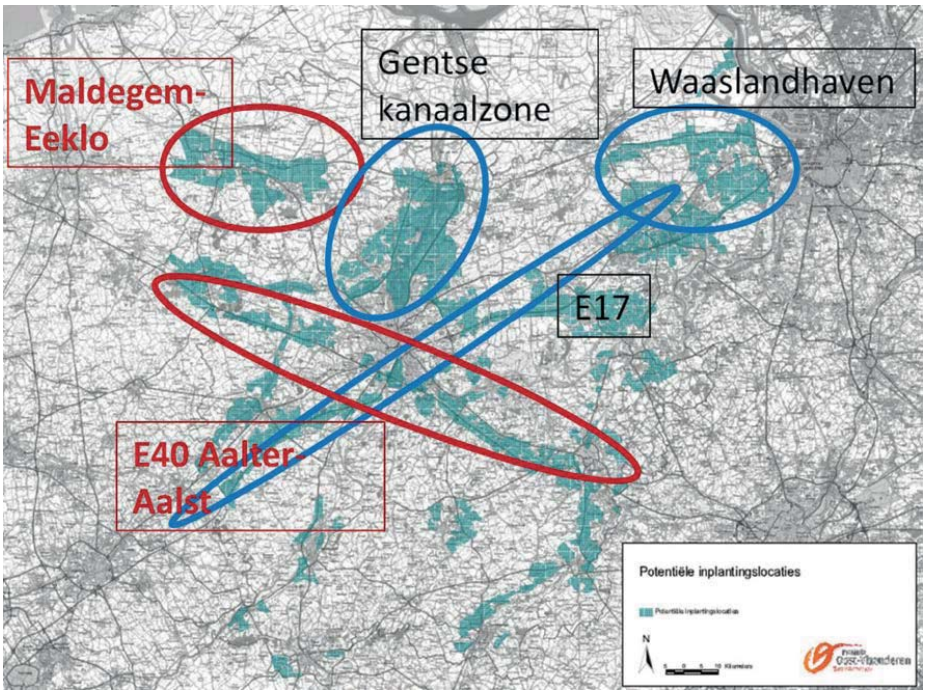

Figure 30. Five macro zones for wind energy; the red zones Maldegem-Eeklo and E40 Aalter-Aalst served as pilot areas.
Source: Province of East Flanders, 2010

Identified areas are still very much in line with Flemish rules for the implementation of wind energy. For instance, the preferences of the Region and the province concerning land-use combinations are very similar and are based on the principles of earlier policies (see Section 3.3.2.1).

The main alteration concerning the previous *PRS Addendum* strategy and the Flemish wind letter concerned the construction of *un*-acceptable locations within the investigation zones. While the Addendum merely stated the intention to define wind energy zones through implementation plans, the zoning plans adopted for the Maldegem-Eeklo and E40-Aalter-Aalst areas did not only earmark land for wind parks, but also designated zones where the production of wind energy was excluded. This planning choice can be traced back to newly-acquired knowledge on environmental impacts, concerns about landscape aesthetics and, above all, public concern during the planning phase. As a result, the creation of acceptable locations demanded an additional step: defining 'unacceptable' sites in the left-over (non-zoned) area.

However, the negative (exclusion) zones are not in line with Flemish rules. In theory, wind parks may be sited in negative zones as long as the proposed projects comply with the Flemish wind letter guidelines. Thus this may be described as a grey area for development. Exclusion zones clearly indicate where wind turbines are not acceptable, but they only have an informal function.

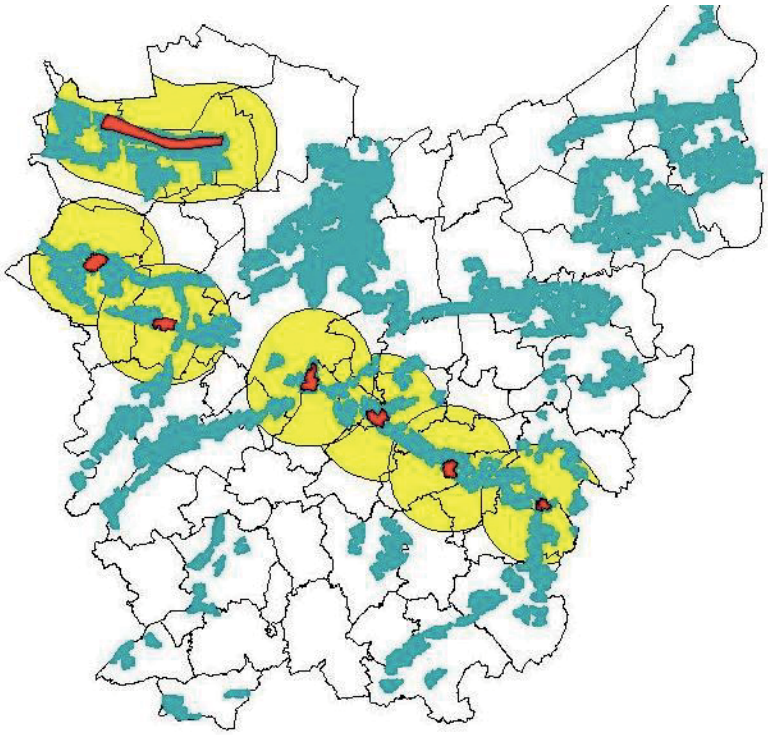

Figure 31. Overlay of potential areas for wind energy (blue), negative zones (yellow) and positive zones (red) within the macro zones Maldegem-Eeklo and E40-Aalter-Aalst
Source: Province of East Flanders, 2014

Figure 31 above presents a map of the adopted positive and negative zones. As explained before, the zoning plans concern only two out of five implementation locations. Later on, the same principles should be applied to the remaining areas. There are three types of zones:

- concentration zones (positive),
- exclusion zones (negative) and,
- landscape zones (high-impact zones).

The last category is part of the exclusion zone: it identifies the area surrounding concentration zones where impacts are expected to be strongest (Fig. 32).

Figure 32. Concentration zone (red) and landscape zone (yellow) within the macro zone Maldegem-Eeklo.
Stakeholders from the landscape zone and wind energy operators working in the concentration zone are asked to manage an environment fund. The fund will be financed by a share of the profits from the wind park
Source: Province of East Flanders, 2014

While concentration zones are based on landscape considerations and positive land-use criteria, unacceptable areas are essentially based on the identification of generic distances. A minimum distance of five kilometres around each concentration zone is considered sufficient to put the Addendum principle of 'concentration and contrast' into practice. Simultaneously, landscape zones begin at a distance of 800 metres from concentration zones.

> The spatial outlook study on the installation of wind turbines in Eeklo-Maldegem has shown that the visual impact is greatest in an 800-metre wide area around the wind turbines. Therefore, this is a priority area for measures to increase the quality of the landscape. (Callens, 2015, p. 98)

The above quote indicates the connection between high-impact area and local compensation. The landscape zone is the area that should profit from compensation measures.

3.3.4.2 Implementation strategy: coordinated plans and local benefits from wind energy

Under the East Flanders implementation strategy, wind energy goals can be achieved if the following two conditions are met: earmarked land and local support. The energy goal adopted was at least 300 wind turbines (630 MW) but has no official time limit.[41] The East Flanders wind power output is to contribute to the Flemish target of 1000 MW capacity installed by 2020 (Flemish Government, 2014b).

To facilitate implementation, the East Flanders strategy relied for a great deal on informal instruments such as communication methods and (non-binding) agreements with local stakeholders. The province decided to play an active role in synchronizing the plans of competing wind energy developers with sites in the same area. Furthermore, it defined standards for local compensation. The goal was to arrive at a minimum of 20 per cent direct participation plus a financial contribution to a landscape fund. But the province could neither force developers to adjust their plans, nor could it guarantee standards for local compensation:

> *The landscape fund in the zone of Eeklo-Maldegem did not provide a framework for direct participation. So we had to improvise a bit to convince the developers. Anyway, they played along because before, only one row of wind turbines was possible. The municipalities initially wanted turbines only to the south of the road. Thanks to our planning process, however, two rows of wind turbines can be installed, not only to the south but also to the north.* (Expert 15, administration, 2016)

The quote illustrates the fact that the achievement of these goals demanded human interaction in the form of a labour-intensive communication and negotiation process with affected parties. The province facilitated this through the strategic energy landscape programme and, more specifically, by setting up a landscape fund for the Maldegem-Eeklo area.

3.3.5 Effectiveness

It seems that the East Flanders planning approach has been ill-fated ever since the province took the decision to zone wind energy. Just after the provincial government had adopted the Maldegem-Eeklo and E40-Aalter-Aalst implementation plans (2014), the Flemish authorities decided to reject the E40-Aalter-Aalst plan (Flemish Minister for the Environment, Nature and Agriculture,

41 The underlying assessment assumes implementation by 2020.

2015b). The East Flanders planning approach is thus fully approved by the provincial government, but only partly by the Flemish Region. This of course has not exactly promoted swift implementation and, needless to mention, has had an impact on the support of affected residents. After all, the province had been communicating its plan concerning the E40-Aalter-Aalst area for a long time and, along with it, its position on where wind energy would be allowed (positive zones) and *not* allowed (negative zones).

This sudden escalation resulted from long-term, seething dissent regarding land-use issues between the Flemish Region and East Flanders. It demonstrates that if there is a lack of coordination in vertical governance, the fundament for effective regional planning is weak. Thus, when looking from this side of the East Flanders wind energy narrative, the case study does not tell us much about the impact of planning decisions on the number of ´MWs installed´. On the other hand, it provides rich material concerning the social and territorial impacts of a planning approach that stretches across several levels of policy-making, two levels of which are not in line with each other.

Table 14 (p. 183) summarizes the findings about desired and undesired effects of East Flanders' planning decisions that were acknowledged by interviewed experts. The findings result from correlating statements by interviewed experts, which were then confirmed through document analysis. Effects were also verified in relation to autonomous developments (independent from the newly adopted rules of the planning approach) that could have changed conditions during the implementation phase. These changes are presented in Table 11 (p. 158).

Table 14. Desired/undesired effects of the East Flanders planning approach
Source: aggregated results of interviews

Related to goal	Planning decisions	Desired effects (intended/unintended)	Undesired effects (unintended)
ECONOMIC: sufficient amount of land to meet wind energy targets	Agreed target: 300 wind turbines (no time limit) on potential implementation areas	Not applicable	Not applicable
TERRITORIAL: resource-aware treatment of land	Combination of positive and negative zoning: ´concentration´, ´landscape´ and ´exclusion´ zones	(x) coordinated and compact development of competing developers in the E40 and ME-zone (intended)	Grey zone: one wind energy operator opposes the rules and develops a project outside concentration zones
SOCIAL: selecting acceptable locations	Positive land-use criteria: bundling with industrial areas and transport infrastructure Negative land-use criteria: minimum distance of 5km between wind energy zones	Affected communities support area choice for wind energy zones ME and E40 (intended)	E40-Aalter-Aalst zoning plan rejected by Flemish government

Related to goal	Planning decisions	Desired effects (intended/unintended)	Undesired effects (unintended)
Maximum and timely implementation	Agreements with wind energy developers that have ground requirements in selected zones	(x) Successful implementation in Maldegem-Eeklo zone (intended)	Not applicable
Local participation and compensation	Compensation measures in high-impact areas, minimum share of 20% local participation	(x) Landscape fund and direct participation will be realized in the ME zone (intended)	Conflicts between wind energy developers with different business models; cooperatives exit the sectoral agency

Note:
Most of the described effects cannot be measured. They are put in relation with the main goals considered in this thesis. In addition, some statements refer to expected outcomes that are valid in the opinion of experts. These are marked (x). ´Not applicable´ refers to effects that cannot be accounted for by interviews.

The information in the table shows us that unintended (undesired) effects in the implementation phase largely resulted from political actions, rather than from those of implementation actors in the selected zones. Indeed, local consultation about wind energy developments had already taken place during the planning phase. Most developers involved in the Maldegem-Eeklo and E40-Aalter-Aalst plans agreed to delay project applications until the competing plans had been coordinated. The same applies to the actions of affected residents who had a say in territorial decisions taken within the planning arena.

So far, the East Flanders approach to wind energy has therefore successfully facilitated local support and coordinated ´maximum´ development in the selected wind energy zones. It has, however, not achieved any political consensus around the controversial issue of wind parks on agricultural land and it could not prevent the development of undesired wind farms.

The following two subsections will address this tension between desired and undesired effects, and their origins, in greater detail.

3.3.5.1 Effectiveness of spatial decisions: acceptable locations, coordinated plans

Since a number of East Flemish zones for wind energy have been discarded by the Flemish government, the remaining elements of the spatial framework for the implementation of wind power are the *PRS Addendum* strategic document and the Wind Letter of 2014. In addition, some effects stem from the approved plans for the Maldegem-Eeklo area (p. 180).

When looking at the economic goal of earmarking land, i.e. to promote wind energy growth, one expert pointed out that the spatial decisions did not effectively accelerate development:

> *Many wind turbines have been placed in East Flanders, but most of them in the seaports. Thus not in the implementation areas. There are a few, but not as many as was imagined in the first place.* (Expert 20, economy, 2016)

Document analysis in this respect reveals that 42 additional wind turbines were installed from 2014 to 2016 and that currently, roughly 40 per cent of the provincial target has been met. There has been a decisive increase in annual growth of capacities installed since 2014. If implementation continued at the current pace[42], the goal of 300 WT could theoretically be reached towards 2030 (instead of the planned year 2020). On this basis, one can conclude that wind energy growth in East Flanders has slowed down.

42 Own calculations. based on the average number of additional wind turbines (11 WT) installed in East Flanders between 2012 (61 WT) and 2016 (117 WT). Source: VWEA annual reports on wind energy development 2012-2017.

The only remaining reference area, when it comes to studying implementation, is Eeklo-Maldegem. In this specific area, zoning has helped to install an additional number of wind turbines. The introduction of the five-kilometre wide exclusion areas softened restrictions of the airport´s radar zone. As a result, wind turbines can now be sited on both sides (instead of only one side) of the federal road:

> *The airport has agreed to a double row of wind turbines due to the five-kilometre wide exclusion zones. Because otherwise they would have a black hole on the radar. (Expert 15, administration, 2016)*

These experiences gained in Maldegem-Eeklo suggest that a planning approach that combines positive and negative zoning could be an incentive to make the best of limited resources.

More evidence can be gained on the subject of social acceptance of the chosen wind energy locations. The East Flanders implementation plans combined wind energy with commercial areas and transport corridors. Zones were developed in close cooperation with affected municipalities and residents. We can therefore conclude that support was born *before* the adoption of the provincial zones and not *thereafter*.

Support arose on the basis of various considerations:

- In Maldegem-Eeklo, one main driver for local support were the communicated negative zones. The affected municipalities agreed to site a second line of wind turbines, because thus other areas would be kept free of wind parks.
- In the E40-Aalter-Aalst area, the opportunity to express a preference for a certain land-use combination helped to reach a consensual decision. The chosen locations placed wind turbines in commercial areas even though this affected a larger number of local stakeholders.

Concerning the territorial goal of safeguarding polder landscapes, the diverging interests of province and Regional State have led to a lack of clarity concerning site availability for wind turbines. The provincial zoning plan intended to exclude parts of areas adjacent to the E40 motorway from development. But as long as the Flemish government had not officially approved provincial plans, development was still allowed – under the pretext that it fitted with wind letter requirements:

> *Based on our spatial policy, the Addendum and the PRUPs, we gave a negative recommendation on this project. However, Flanders allowed the project after all. It has been a disadvantage that the planning approach of the province and that of Flanders occasionally contradict each other.* (Expert 15, administration, 2016)

The project in question was finally to be realized. However, the wind turbines still did not spin at the time this analysis was conducted. The project had not yet been approved by the province and stood under appeal.

3.3.5.2 Effectiveness of the implementation strategy: landscape fund and participation resulted into internal disputes in the wind energy sector

The labelling of selected wind energy areas as ´concentration zones´ already hints at the intention of the province to site wind energy in the most compact way possible. To overcome the barrier of splintered land requirements (and thus splintered development), the province invited developers to participate in the creation of wind energy zones. To secure collaboration, a declaration of intention was signed under the patronage of the VWEA. Developers agreed to share information and to pursue the goal of *optimale invulling* (optimum loading) of future concentration zones.

Another important instrument that provided support to developers was the energy landscape programme. The programme structured the discussion between competing market players. The initial plan was that developers would solve the problem of devising a collective plan among themselves. This eventually had to stop when it became evident that agreements about the infilling of potential zones negotiated solely among market players would conflict with the European Union's prohibition of cartel agreements. The communication format was changed to bilateral meetings between the ´neutral intermediate party´ of the province and individual developers. This strategy then led to the desired effect, i.e. coordinated plans in the Maldegem-Eeklo and E40-Aalter-Aalst areas:

> *Currently, four or five developers are cooperating on one project in Maldegem-Eeklo. Each of them submits a separate planning application. However, they did the environmental assessment together. So in the end it turned out to be a collective project instead of a collection of separate projects.* (Expert 15, administration, 2016)

Decision-making for the E40 plan was more complex since it concerned several concentration zones. The province reported that not everybody had been in agreement with the ´concentration and contrast´ principle during the planning process. In fact, during the area selection process, some active developers submitted proposals for extension:

> *One of the developers in the E40-Aalter-Aalst area did not want to cooperate. He said: ´Since we are the ones submitting the planning application, we are not interested in the policy framework of the province, and we certainly do not want to reduce our profits because of an environmental fund. In short, we do not care about the province. We opt for the wind letter. For us, Flanders is the authorized organisation.´* (Expert 15, administration, 2016)

Success or failure of the strategy thus depended greatly on the willingness of active developers to agree on provincial standards. As already stated in the previous subsection, developers had the option to step out of line and refuse to comply with provincial plans. The loophole of a project permit for sites in exclusion areas (under higher-tier Flemish rules) was still available. The resulting power play between Flemish Region and East Flanders constrained relations between both parties.

A second point of contention was related to diverging interests between East Flanders and the VWEA wind energy agency. The province demanded high levels of financial participation and compensation of affected residents. One important side product of the ´support strategy´ was the establishment of a landscape fund in the Maldegem-Eeklo area, which would be fed by the earnings of wind power generators and administered by local stakeholders. The problem was that not all developers opted for a cooperative business model. They had devised their own communication/participation methods and were not used to complying with fixed standards. This led to a feeling of being ´ripped off´:

> *We had been told that there has to be 20 per cent participation in the wind park development. When five turbines were installed, the fifth turbine would be owned by the municipality or a cooperative. That means that one turbine is free of charge for the others. (…) Other forms of participation by cooperatives were discouraged. A landscape fund had to be created to plant all kinds of trees. Then you get a feeling of ´we are exploited here´. Thus a wind turbine is a 'cash cow' and you have to get the most out of it, with additional requirements that were not to be found elsewhere. There has been a lot of discussion since then.* (Expert 20, economy, 2016)

The conflict around the Maldegem-Eeklo landscape fund led to a split between the affected cooperative developers and VWEA. The cooperatives did not agree with the positions of the majority of VWEA members anymore:

> The reason for Ecopower and BeauVent to leave VWEA was that the sector organisation no longer sought a consensus within VWEA on positioning and lobbying work regarding the planning process of the province of East Flanders. Under the pressure of the majority of project developers, VWEA now represents opinions that are not supported by the cooperative developers Ecopower and BeauVent. By giving up the consensus model, VWEA can no longer pretend to express the opinion of the entire wind sector in Flanders. (RESCOOP, 2014)

The landscape fund ´*Milde Meetjes*´ is still under development, but the signs are good that the scheme will be realised. In 2017, the province announced that the affected residents, farmers, and wind power operators had achieved a consensus (Haertjens, 2014). The fund will be activated at the moment when the planned wind turbines start generating power.

3.3.5.3 Effects of planning arena transactions

What is extraordinary in the East Flanders case is that actions taken during the planning phase provided the basis for the desired development. In other words, the format of the planning arena had a strong influence on the implementation of the main planning goals.

We can therefore talk about a couple of learning effects that have their roots in the interactions that took place during the planning phase. One example is provided by the experiences around collective plan-making by local developers. Because the splintered land requirements of competing developers constituted a

major hindrance to coordinated development, the province invited interested parties to participate in the decision-making process. The question, however, was which communication format would be necessary to reach agreement.

At first, developers had a preference to debate the options for a collective plan among themselves. However, it became quickly obvious that this cooperation format did not conform to European rules prohibiting cartel agreements. The province and the VWEA wind energy agency then took over the role of moderator in the debate and helped share information.

Similar learning effects were achieved in connection with the public participative planning procedure. Though public attitude towards the East Flanders wind energy plans was rather negative at the beginning, it became more positive when residents were given the opportunity to have a say in the zoning issue.

3.3.6 Conclusions

With its planning approach to wind energy, the Province of East Flanders had done pioneering work in many respects. While the Flemish Region, the second-highest level of planning, had not established any concrete wind energy targets up to 2014, the province of East Flanders (the third-highest level of planning) has been pursuing a more pro-active course since 2009; it established a wind energy target on its own initiative. Thereby, the province decided to, firstly, take spatial planning decisions and select potential implementation areas. After that, a maximum number of wind turbines were coupled to the selected areas through an assessment of the wind energy potential. The strong spatial emphasis of this approach expressed itself in the labelling of the target: 300 wind *turbines* instead of MW or MWh.

The East Flanders planning approach to wind energy was also determined by decisions taken by the Flemish Region, which provided spatial guidelines concerning the regional spread of wind turbines and preferred land-use combinations. East Flanders then converted these guidelines into zoned areas. Although the policies of Flanders and East Flanders were comparable as far as their content is concerned, they highly differed in their execution. While Flanders provided no cartographic indication of preferred or excluded areas, East Flanders stipulated positive and negative zones in provincial implementation plans, a spatial planning instrument.

<u>Planning approach: concentration and contrast, fair distribution of gains and losses</u>

The definition of wind energy zones in East Flanders was based on a twofold approach to spatial planning. As a first step, five large-scale implementation areas were selected; these indicated the preferred settings for wind energy from a provincial point of view. As a second step, East Flanders started to define zones for

wind energy within these areas. By 2014, zones had been established for two out of the five implementation areas: Maldegem-Eeklo and E40-Aalter-Aalst.

The leading spatial planning principle regarding wind energy developments was ´concentration and contrast´, which was translated into positive (concentration) zones and negative (exclusion) zones. As regards land-use combinations, developments were clustered with industrial areas and along transport infrastructure. In concentration zones, wind energy generation was to be prioritised and implemented in the most compact way possible, while the surrounding five kilometres were excluded from development. In addition, the area up to a distance of 800 metres from a concentration zone was to be upgraded. These high-impact areas were labelled ´landscape zones´. Landscape zones should be made particularly attractive through green interventions, e.g. planting trees and laying bicycle paths.

As regards the implementation of concentration zones in East Flanders, the province applied specific standards that strove for a fair balance between the local ´gains and losses´ of wind energy projects: a landscape fund should be set up and derive its income from implemented projects. In addition, the province requested operators to grant local residents a financial share of at least 20% of the projected wind park. This approach, again, was highly different from the implementation guidelines of the Flemish Region, which did not intervene in the practices of market players in the wind energy sector. The regional authority allowed operators some creative leeway in the execution of local planning procedures and the consultation of residents.

Conditions before 2014: wind parks on agricultural land — a controversial planning issue

In 2009, the Flemish Region yielded to increasing demands coming from the wind energy sector to allow wind energy developments on agricultural land. Until then, the land-use combination of wind power generation and agriculture had been barred under spatial planning law. On the other hand, Flemish spatial policy for wind energy aimed to bundle wind power generation and transport infrastructure, and the strips of land adjoining transport infrastructure were often agricultural.

Right from the beginning, the Region’s new rule conflicted with the East Flanders spatial vision for wind energy, which aimed to conserve open agricultural landscapes, including those along transport corridors. When it was confronted with a wave of project inquiries concerning agricultural plots, East Flanders promptly introduced exclusion zones in the detailed plans related to its five large-scale implementation areas. Survey responses indicated that public acceptance of wind energy in polder areas was significantly lower in East Flanders than in other provinces (VEA, 2011) and this led to a more restrictive approach in spatial planning.

Another influential factor was the lack of binding rules for the distribution of formal power between Region, provinces, and local communities. Responsibilities were distributed on a project basis. This led to uncertainty, both among authorities and operators, about the level at which a project proposal should be dealt with. In principle, each governance level — local, provincial, or regional — may initiate the approval of land for wind energy through the — local, provincial, or regional — implementation plans, respectively.

Planning arena: collaborative efforts of planning and implementation actors

The primary emphasis of the wind power approach of East Flanders was to remove uncertainties in regional and provincial spatial planning requirements by defining locally agreed zoned areas. It took the province four years to identify the right areas: from 2010 to 2012, the first phase, mainly professional experts were involved in spatial decisions; in the second phase, from 2012 to 2014, non-professionals such as local stakeholders were invited to participate in the planning process.

Individuals were given a voice in the decision-making process thanks to community polls. For instance, residents of the Maldegem-Eeklo and E40-Aalter-Aalst areas were asked to state their preferences for one of several plans. An even more fundamental choice was whether residents preferred the province to zone wind energy or whether the choice of exact locations, under Flemish rules and regulations, should be left to market players.

The province of East Flanders facilitated communication with local stakeholders through a practice-based, funded programme called ´energy landscape´. The project acted as an interface between the differing interests of provincial and regional authorities, and of the main implementation actors at local level: active developers, residents, and landowners. Within the framework of the energy landscape programme, locally active developers, residents, local authorities and landowners were requested to work towards an amicable solution for the organisation of a landscape fund in the Maldegem-Eeklo and E40 implementation areas. All this was done using a cooperation format that was supervised by the provincial spatial planning department.

Effects of planning decisions after 2014: abolished wind energy zones; compact, agreed developments

Shortly after the completion of the Maldegem-Eeklo and E40-Aalter-Aalst implementation plans, a major part of the freshly adopted wind energy zones was suspended by the Flemish government. The province’s exclusion zones conflicted with higher-tier rules of implementation that exploited wind energy along transport infrastructure. Following this event, there is little available evidence that

the economic goal, i.e. implementation of the provincial wind energy target, will be met.

As far as the social and territorial goals of the planning approach are concerned, neither wind energy developers nor the East Flanders population have sufficient planning security: they do not know where wind energy will be implemented and where it will not. The province did communicate the institutionalised exclusion zones, but these spatial restrictions can be circumvented by referring to higher-tier, Flemish Region policy requirements. The lingering conflict between the Flemish Region and the province of East Flanders around wind parks on agricultural land therefore kept constraining wind energy development. Developers who did not agree with the provincial zoning restrictions could still apply for permission to the regional authority. In consequence, wind turbines were allowed in areas where East Flanders had refused them. This mainly applied to the E40 area, whereas in Maldegem-Eeklo, both parties agreed on the location policy.

Thus, positive effects of the East Flanders planning approach were limited to experiences in the Maldegem-Eeklo area. Here, the approach enabled the coordinated action of competing developers and the installation of a larger number of wind turbines. In addition, the landscape fund, as an instrument, has led to the building of consensus between wind energy operators and the local population. The strict participation and compensation standards for affected wind energy developers, however, seriously displeased the Flemish Wind Energy Association because it favoured developers with a cooperative business model.

Drivers and barriers: negative zoning and learning-by-doing

Factors that had a positive influence on public support for wind energy included the labelling of zoned areas (clearly positive or clearly negative) and the differentiation between types of zoned areas (concentration, exclusion, landscape). In particular, negative labelling played an important role promoting support by the local population for provincial wind energy implementation plans. Experience gained in the Maldegem-Eeklo area indicated that the combination of positive and negative zones incentivised compact development. Furthermore, the chosen land-use combination (wind energy, transport infrastructure, and industrial land) was generally supported both by wind energy developers and the population. However, in highly-valued rural areas the combination with infrastructure conflicted with comprehensive planning schemes to protect rural surroundings and with the shared value of an identifiable cultural landscape.

The foundation for acceptable wind energy locations was laid down during the planning process. Active developers and affected residents were actively consulted and were invited to study the possibility of devising collective plans. In this context, the funded ´energy landscape´ project institutionalised a learning-by-doing process in planning and cooperation with local stakeholders, which helped to overcome

conflicting interests. Other important instruments that facilitated the implementation of provincial goals were declarations of intent by province and developers, signed under the patronage of the Flemish Wind Energy Association. In addition, the landscape fund scheme provided a discussion basis for the fair distribution of ‘gains and losses’.

Among the factors that had a hindering influence, the lack of consensus and the discrepancies in policy framing between the Flemish Region and the province of East Flanders was the most important barrier. The dispute about wind projects on agricultural land discouraged public support and created uncertainties for project-level development. A lack of vertical coordination in spatial planning for wind energy is thus a weak foundation for effective implementation.

4 Reviewing the outcomes: conclusions and implications

4.1 Introduction

This thesis has investigated how effectively regional planning institutions govern wind energy deployment. Wind energy is hardly a neglected topic: since the 1990s, this energy source has gained in importance worldwide thanks to highly-developed turbine technology and its wide range of potential application in different settings. In the context of international climate policy, wind energy is being promoted as a promising alternative to fossil sources. Many regions within the European Union have therefore chosen wind power as the (main) means to decarbonise their electricity supply.

Regardless of whether we agree — from an institutional perspective — that energy generated from wind can ever be considered 'oil-equivalent', evidence presented in this dissertation seems to suggest that regional planning authorities are increasingly considering it their task to set land aside for wind energy deployment in order to meet the requirements of energy roadmaps agreed at higher governance levels.

The current professional discourse within spatial planning focuses on defining the right wind turbine siting areas to achieve a social consensus about the impacts that would be acceptable from a public perspective. An emerging approach is ´positive zoning´, i.e. the selection of areas where energy production is considered consistent with local conditions. However, zoning also poses crucial dilemmas for planning authorities: what parameters determine the area selection and whose interests are given priority?

Despite the lasting relevance of wind power for climate protection, so far there has been little in-depth scientific analysis of the interface between spatial planning and energy policies in an international context. This dissertation contributes to filling this knowledge gap and identifies scopes of action in spatial planning with regard to wind power expansion. Instead of reducing the task of spatial planning to a single goal — the fulfilment of energy standards, decided at higher tiers of government — this thesis has repeatedly argued that planning approaches to wind energy have an economic and territorial, as well as a social component: the creation of lasting, mutual social expectations regarding the implementation goals.

Wind turbines, especially onshore developments, are not only widely acknowledged symbols of the energy transition, they are also an expression of a growing conflict between local and higher-tier planning interests, which manifests itself, if nothing else, in emerging resistance from the local population. For an institutional analysis of planning and implementation this constitutes an ideal situation. Indeed, the institutional perspective acknowledges that local circumstances and specific decision-making actors significantly influence whether,

and how, wind power will be implemented. The context of the 'urbanised region' provides a comprehensive panorama of 'circumstances and actions'. The diverse, functional relationships found in densely populated areas provide an ideal breeding ground for conflicts of interest that arise from the expansion of wind power.

This last chapter of the PhD thesis will combine the evidence from the empirical part of the thesis (Chapter 3) with the theoretical foundations presented in Chapter 2. To this end, we will firstly recall the research questions that were raised in the introductory chapter, and secondly the underlying theoretical orientation that was applied to structure the comparative case study analysis. After that, we will draw a comparison between the individual case studies. This will present commonalities regarding the institutional factors that drive wind power development, the impacts of spatial and governance choices, and the key actors in decision-making processes.

Finally, based on the results of an expert workshop, we will reflect on the transferability of recommendations for action from the case studies to other settings. They will take into account the wider perspective of this thesis, which defines spatial planning as a method to deal with renewable energy sources in a democratic and comprehensive way rather than as an instrument ´to pass on´ sectoral energy goals to local implementation levels.

4.2 Conclusions

This section 'takes stock' of the main findings of the case studies conducted in South Holland, Lower Austria and East Flanders. It draws conclusions about the effectiveness of regional planning approaches to wind energy from an international perspective.

But before we turn to empirical results, we will first reflect on the main issues addressed by the thesis and applied theories. The resulting insights will be incorporated into the discussion of the case study results.

4.2.1 Research questions and theoretical foundations

What planning approaches have been applied to implement onshore wind power in European urbanised regions and what is their effectiveness?

The main research question was divided into a number of more operational sub-questions, which were asked during each case study. Each sub-question referred to one important component of the conceptual framework presented in Section 2.2.3. Within the framework, the interrelation between planning practice and implementation is described as a circular process. Based on the ACI (Actor-Centred Institutionalism) and IAD (Institutional Analysis and Development) models — which were developed to compare and evaluate government practices in different institutional settings — it is argued that regional planning approaches and their effectiveness are determined by actions in the *planning arena*, the setting where actors interact to take decisions. Equally, they are shaped by *conditions*, i.e. the constraints under which participants of the arena act when making decisions and the incentives that spur them on.

The conceptual framework emphasised the correlation between the causes and effects of spatial policies for wind energy. Strictly speaking, this goes beyond the purpose of the main research question, which was narrowly focused on policy-making process outcomes, i.e. planning decisions and their implementation. The main question thus set an overall objective while the sub-questions structured the process of analysis by specifying what was to be investigated and in which order. However, the much more noteworthy, content-oriented approach to answering the research question was only developed during the in-depth theoretical discussion in Chapter 2, 'Theoretical Foundations', which ended by presenting the conceptual framework. Moreover, a structured comparison of the case studies could only take place through the examination of answers within a theoretical framework.

According to Ostrom (2005), researchers should consider the individual parts of her IAD model as 'holons'[43], and align their contents with the specific topic and goals of their research work. It is precisely this 'aligning' that took place in the 'Theoretical Foundations'. The research questions presented in the introduction were discussed and the substantive orientation used to answer them was developed. The following paragraphs contain a brief review of the research questions and applied theory:

- The first component of the framework — *conditions* — referred to the first sub-question: *What (territorial/social/economic) factors have had an impact on planning decisions concerning wind energy?* This question was already dealt with in the introduction. Then, the 'dimensions' of planning considerations (Section 2.1.3) were combined with 'New Institutionalism' and the theoretical orientation, i.e.: factors influencing wind energy decisions go beyond formally established rules, laws, and regulations.

- The same applied to the theoretical orientation of the framework´s component *planning arena*, which referred to the second sub-question: *What participants were involved in the decision-making process and what information was accessible?* The position of participants within the arena was defined according to ´actor dimensions´ and ´spatial-organisational levels´. As a result, not only prevailing interests but also dominant tiers of government could be captured, which turned out to be an essential distinguishing feature in the case-specific actor constellations. In addition, a differentiation was made between knowledge development (content-related parameters) and interaction structures (organisational parameters) in the decision-making process.

- The third sub-question — *in what ways did conditions and participants combine, resulting in regional planning approaches to wind power?* — addressed the *planning approach* component. This question was perhaps the most intensively worked out in advance. Our theoretical foundation assumed that planning not only encompasses the task of defining appropriate locations but also the task, within a chosen location policy, of promoting developments according to the anticipated goals of wind power policy.

- However, this implies that planning institutions position themselves in order to promote the reconciliation of diverging interests. This led to a further substantive debate in Chapter 2: what public interests are involved? Five

[43] Concept of *holon* by Arthur Koestler (1969). A holon is something that is simultaneously a whole and a part.

implicit policy goals were detected that do not easily go hand in hand. Three of these concerned the desired outcomes of zoning decisions: sufficient land availability for energy goals; resource-aware treatment of land; and a location policy supported by the population (acceptable locations). The other two concerned process-oriented goals: timely and compact implementation; and local participation and compensation. These objectives were associated with the component called *implementation* within the conceptual framework and the answer to the last sub-question: *how effective has the chosen planning approach been so far?*

In order to frame the answers to these research questions, we made use of two theoretical models that were particularly suitable: ACI and IAD (Section 2.2). These models decisively place the research focus on the 'black box' of the planning arena. The interaction of actors in the relevant arenas had, according to evidence presented in this thesis, undoubtedly affected the effectiveness of policies. The main research question focused on the results of the interaction (decisions and outcomes); yet, much more valuable results were to be found in the reconstruction of the relevant planning arenas and conditions (structuring parameters). These provide an explanation for the detected (either desirable or undesirable) effects of wind energy policies. For this reason, the third and last part of this chapter (implications) will deal more intensively with those variables that affect decision-making processes in spatial planning rather than the observed policy outcomes.

4.2.2 Comparing the case studies' results

After reflecting on the theoretical foundations and research questions, we now turn to the findings of our policy analysis. So far, the case studies conducted in South Holland, Lower Austria and East Flanders have been presented separately from each other. This was in order to avoid mixing up context-related results with experiences from other regions prematurely. Conclusions on the effectiveness of the individual planning approaches were therefore first developed 'from inside' in order to be able to reflect freely about important commonalities at the last stage of analysis.

Having arrived at this stage, we will thus ascend to the next level of abstraction: the level of ´European urbanised regions´, which was announced in the main research question. This will be done by reviewing the outcomes of the region-specific evaluations from a more comparative perspective. The review's purpose is to detect congruent insights. The comparison first involves the components of the conceptual framework: conditions, planning arena, planning approach and implementation. Afterwards, the most important findings will be summarised at the end of this subsection.

4.2.2.1 Conditions: permit-giving power relations and their consequences

Table 15. Territorial, social and economic factors that influenced wind energy decisions in South Holland, Lower Austria and East Flanders

	Territorial factors	Social factors	Economic factors
South Holland (Netherlands)	Wind energy zones and exclusion areas, development focuses on industrial areas. National/regional tiers of government have main permit-giving powers but in practice, these are transferred to local authorities.	'Green heart' planning doctrine. Influential landscape planners plead for choreographed siting of wind turbines.	Low wind energy growth, wait-and-see attitude of developers. Subsidy regulations frequently modified, stalled negotiations about land allocation between national government and provinces.
Lower Austria (Austria)	Generic distance regulations. Outskirts of towns and villages excluded from wind energy, haphazard development on agricultural land. Local authorities have main competences to approve developments.	Shared understanding ´Hainburg Movement´, wind energy has long been perceived as an environment-friendly alternative to hydropower. Ornithological organisations increasingly lodge complaints.	National subsidy programme created a solid basis for development. Wind energy became an important source of income for structurally weak communities.
East Flanders (Belgium)	Higher-tier guidelines (land-use criteria): wind parks on industrial areas and nearby transport infrastructure. Unclear handling of permit-giving power: Flanders is competent authority but lower tiers of government may also take initiative to allocate wind parks.	Safeguarding remaining rural landscapes is a value that is widely shared by the East Flanders public.	The Flemish incentive programme provides stable conditions for investment. First-come, first-served behaviour: competing developers secure plots in the same area, uncoordinated project submissions.

Institutional factors that influenced planning decisions in all three case studies strongly related to established planning routines concerning the handling of power. Thereby, one essential factor was the amount of freedom that local

authorities (or other subordinate tiers of government) were given to take spatial decisions regarding wind power. The overall pattern is that regional authorities pass fundamental decisions down the line. There are, however, variations in controlling local action: in Lower Austria, local authorities could reject wind power initiatives even if project proposals complied with the state´s location policy. Lower Austrian municipalities thus enjoyed considerable autonomy regarding the deployment of wind turbines in dedicated areas. But in South Holland and East Flanders, where higher-tier public bodies were in principle allowed to designate wind parks 'top-down', these bodies also wished to pass decisions down the line. One example is the South Holland case, where decision-making authority over wind energy projects has usually been transferred through covenants. Similarly, the Flemish Region has facilitated ´plan initiatives´ of lower-tier government bodies. Hence, we could not actually observe any established, ´top-down´ approach to permitting wind energy projects in any of the case studies.

The way in which decision-making competences were dealt with (these were relatively well-defined as such, yet were differently interpreted or applied in practice), was reflected in the planning practices of wind power developers. In all three case studies, market parties have been strongly promoted in the past five to ten years — through stable subsidies and an ambitious energy policy. But this has also led to tough competition for remaining locations. If, as in the case study of Lower Austria, the community level prevails in planning decisions, the competition, as one of the interviewees described it, concentrates on 'courting' the favour of the relevant municipal council, mayor or, if referenda are decisive, the local population. If (as in South Holland or East Flanders) the inter-communal or city-regional level is in charge, competition centres on the acquisition of land use rights through preliminary contracts with property owners (aptly referred to in the interviews as 'terrain positions') to secure a strong starting position; such market parties, deployed in a particular area, are referred to as ´active developers´.

Both practices have led to an inefficient use of land resources, since the placement of wind turbines has been controlled by economic/social factors, rather than by territorial (resource-aware) considerations of efficient siting. It also means that at the point when regional authorities in the case studies decided to zone wind energy, the goods had already been snatched and thus the parameters for the 'redesign' of the regional location policy were severely limited.

Thus, wind power increasingly did (or threatened to) slip out of the control of local spatial planning; at the same time, higher-tier regional renewable energy schemes were promoting expansion. Consequently, in the course of time, all three regions witnessed the development of an organised (and standardised) resistance of the local population to wind power projects. This is particularly interesting because, in the case studies, fundamentally different land use combinations were favoured before zoning plans were introduced. While Lower Austria promoted wind on

agricultural land, South Holland and East Flanders opted for the combination with infrastructure. Besides, very different conceptions underpinned legal stipulations regarding distances between wind turbine sites and residential functions. Nevertheless the deployment of turbines was an increasing source of irritation for the population, tourism and nature conservation organisations, and local authorities confronted with large-scale development on their territories or just beyond.

4.2.2.2 Planning arena: few interaction between planners and implementers

Considering that actions taken by the affected local population, 'terrain positions' of active developers, and the attitudes of local communities strongly influenced wind energy deployment, it is surprising that these parties were largely excluded from regional planning decisions in the three case studies. Even in East Flanders, where emphasis was placed on participatory planning at the implementation stage, zoning areas were identified at a high governance level and submitted to the population's approval only later. The following actor map (Fig. 33) is an overview of the core participants during the planning and implementation stages in the three case studies.

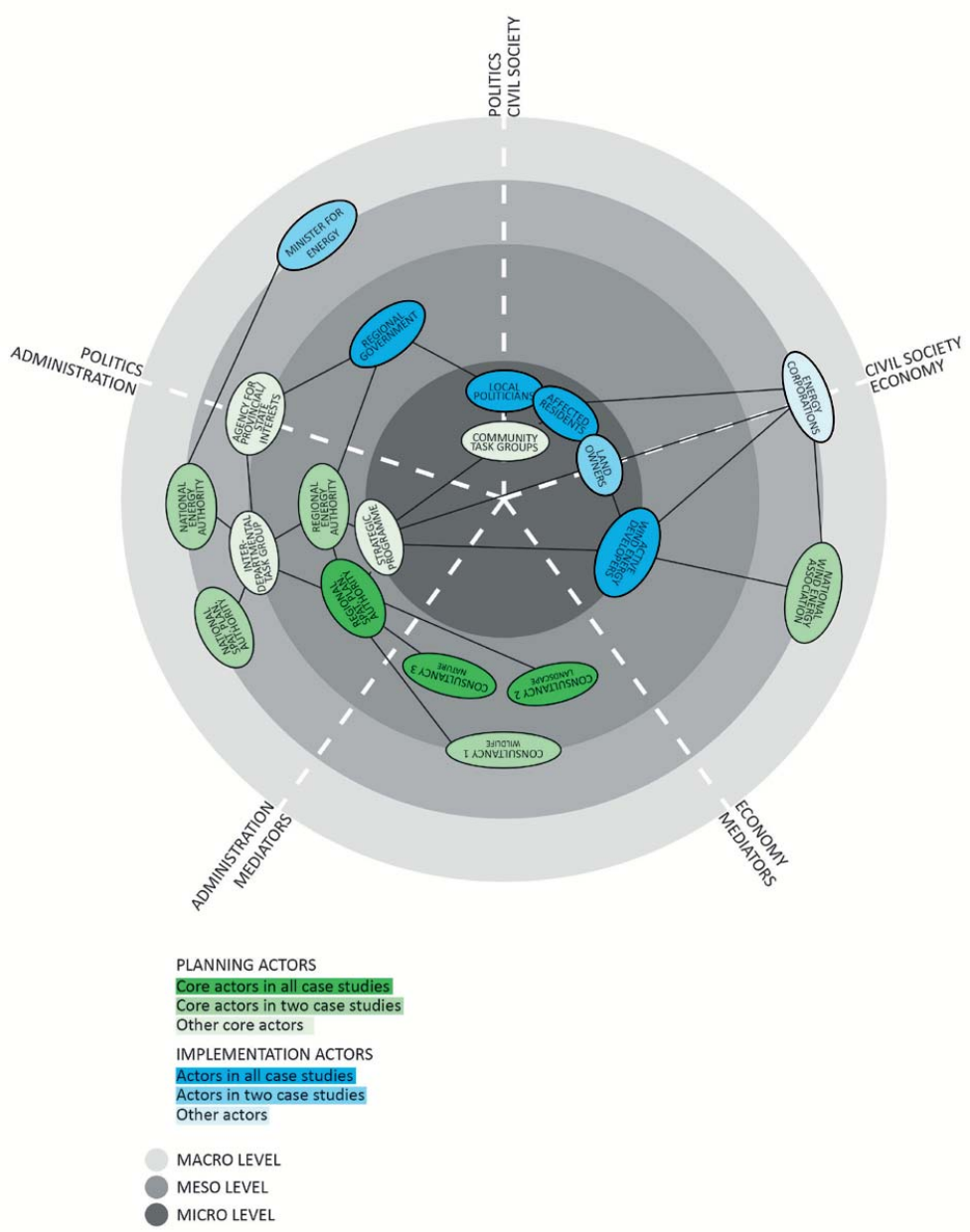

Figure 33. Aggregated actor map of the three case studies.
Positions and interactions of planning core actors and implementation actors
Figure by the author

The map shows that decision-making processes were characterised by knowledge exchange between experts from higher-tier public administration and consulting firms (spatial planning, landscape, nature/wildlife protection, and wind energy). The expectation was that consultation between experts representing national/regional interests would lead to smooth implementation. In reality, this practice largely overlooked the influence of the local implementation context.

Moreover, to a great extent, decision-making processes were dependent on the planning procedures already institutionalised within each planning system. At least in East Flanders and Lower Austria, standard operating practices concerning wind energy provide little coordination between meso-level planning decisions and macro-level energy schemes. In South Holland, an intermediate public body facilitated exchanges between government and provinces about wind energy issues at the macro level of planning (IPO, see Section 3.1.3), something that was not found in the Lower Austrian and East Flanders planning arenas. Planning actors at the meso level in Lower Austria and East Flanders therefore operated in relative independence from higher tiers of government.

In any case, the composition of the planning arenas in the three case studies is very different, but a few similarities can be discerned:

- Exchange with actors from civil society was negligible in South Holland and Lower Austria.
- There was a lack of coordination between locally active developers and regional planning bodies.
- Altogether local authorities were not influential in regional planning decisions, but they did hold a central position in the implementation of wind energy zones.
- Consultancy firms, i.e. actors engaged in mediation, played a key role in the decision-making process. However, these parties did not have a neutral stance on wind energy issues: energy and environmental protection/landscape interests were dominant.

4.2.2.3 Planning approach: diverging priorities and levels of policy-making

Table 16 (p. 204) summarises the planning options at various spatial-organisational levels in each case study. These options relate to the sum of (spatial and governance) issues addressed in the three cases. The effectiveness of associated planning decisions — the specific procedural parameters that should incentivise development according to our five implicit policy goals — will be discussed in the next section.

Table 16: Planning options and levels of policy-making in South Holland, Lower Austria and East Flanders

Spatial-organisational levels	Available options	South Holland	Lower Austria	East Flanders
Macro level	**Spatial strategy**			
	E1. Coupling of energy targets to zoned areas			
	E2. Size limits for zones: minimum / maximum			
	T1. Distribution of zones: concentrated / dispersed			
	T2. Types of zones: positive / negative / other			
	S1. Allocating zones according to generic rules / spatial-geographic criteria			
	S2. Defining land use criteria: constraints / combinations			
	Implementation strategy			
	S3. Siting criteria for wind turbines: linear / grid / compact			
	G1. Defining levels of decision-making			
	G2. Criteria for local participation and compensation			
Meso level	**Spatial strategy**			
	E1. Coupling of energy targets to zoned areas			
	E2. Size limits for zones: minimum / maximum			
	T1. Distribution of zones: concentrated / dispersed			
	T2. Types of zones: positive / negative / other			
	S1. Allocating zones according to generic rules / spatial-geographic criteria			
	S2. Defining land use criteria: constraints / combinations			
	S3. Siting criteria for wind turbines: linear / grid / compact			
	Implementation strategy			
	G1. Defining levels of decision-making			
	G2. Criteria for local participation and compensation			
Micro level	**Spatial strategy**			
	E1. Coupling of energy targets to zoned areas			
	E2. Size limits for zones: minimum / maximum			
	T1. Distribution of zones: concentrated / dispersed			
	T2. Types of zones: positive / negative / other			
	S1. Allocating zones according to generic rules / spatial-geographic criteria			
	S2. Defining land use criteria: constraints / combinations			
	Implementation strategy			
	G2. Criteria for local participation and compensation			

The numbering 1, 2, 3 indicates that several options were available with respect to one type of goal (E,T,S,G).

The information in the table makes clear that planning approaches to wind energy involve various tiers of government — whereby the 'mutual interpenetration' (Reimer, 2014) of higher-tier location policies and local-level implementation practices turns out to be highly different in each case study. We can discern different priorities:

- The South Holland approach is considerably more macro-level oriented. It focuses on the economic goal of sufficient land availability. At every spatial-organisational level, a specific unit size (expressed in megawatts) to be installed by 2020 in the targeted area is nailed down. Location choice is motivated by a landscape conception or ´narrative´. Local communities have limited possibilities to object to development within national and provincial wind energy zones.
- The Lower Austrian example displays the most autonomous approach. The national level is practically invisible, nor does the state interfere in local planning. It decidedly refrains from imposing implementation rules on local authorities. The area selection is largely determined by a uniform distance regulation, which requires large distances between wind farms and residential areas. The approach is designed to exclude controversial locations in advance.
- The East Flanders approach is the most fragmented one; one essential element is micro-level stipulations. These relate to economic, territorial as well as social standards for local development. In compliance with the planning principle of ´concentration and contrast´, East Flanders introduces positive and negative zones. The province thereby pursues a more restrictive location policy than the Flemish Region. The same applies for the adopted implementation rules that seek to balance local ´gains and losses´ of deployment.

Reflecting on the different approaches, we may ask ourselves to which extent these priorities have been driven by legal regulations, in particular the formal distribution of planning competences. In fact, the different orientations cannot be fully attributed to legislation and formal practices (see 'handling of power' in the previous section). Rather, they exemplify the varied attitudes of regional planning

authorities in different countries towards intervention in local-tier practices or higher-tier policies. These attitudes are driven by economic and social influencing variables. For example, in the Netherlands, stagnating wind power deployment motivated the government to intervene in provincial plans in order to safeguard land for energy targets. Lower Austria, in contrast, was dealing with the opposite problem: wind power only became a regional planning issue after an intensive expansion phase. Locally-controlled development increasingly clashed with environmental protection interests and this led to disputes between municipalities. In East Flanders, higher-tier Flemish policies occasionally conflicted with the safeguarding of polder areas, a provincial goal. Faced with a fast developing wind energy sector, the province took action and excluded wind farms from undesired locations.

Hence, the comparison highlights the varied, contextual 'control strategies' that regions may apply when dealing with wind power. These are directed to both local-level implementation and higher-tier requirements. In the spectrum of possible approaches, Lower Austria und East Flanders represent two extremes: while one adopts a rather ´laissez-faire´ approach, the other actively seeks to shape planning both at the macro and micro levels. South Holland, in fact, navigates somewhere in the middle by complying with national polices but transferring implementation responsibilities to local parties.

Next to the priorities identified above, the case studies exemplify how important it is to communicate what precisely is understood under 'wind energy zone'. Zoned areas have been labelled in a specific way and this labelling is closely related to the extent to which regional governments want to intervene in local land-use decisions: Lower Austria never actually sought any 'preferred' locations and subsequently labelled its zones in a neutral way (§19 areas). In contrast, South Holland and East Flanders labelled zoned areas in a positive way (e.g. concentration zones). Here, positive land-use criteria determined the selection of acceptable locations. In both regions, a ´landscape narrative´ was invoked to define suitable locations. Regional planning institutions thus can influence the decisions in a manner that is either rather proactive or reluctant, depending on the commitment they are willing to make.

4.2.2.4 Implementation: Desired and undesired effects and the exaggerated expectations of zoning

In this section, by comparing the observed outcomes of planning approaches, we will gain new insights into variegated unintended byproducts of zoning wind power. The following part therefore deals with the specific planning decisions — including the procedural parameters governing the authorisation, rejection, promotion, and management of wind power initiatives. The most important findings will first be summarised in tables.

Table 17, Table 18 and Table 19. Comparison of the effects of spatial decisions and their related institutional drivers/barriers within the framework of the three case studies
Note: Effects that are based on expectations are indicated as (x) ; ´not applicable´: effects that cannot be accounted for by interviews.

SPATIAL STRATEGY Related to economic goal: sufficient land availability for wind energy					
	Planning choices	Desired effects	Main drivers	Undesired effects	Main barriers
South Holland	Medium-term energy goal. 735.5 MW by 2020. Subordinate goals for specific zones.	(x) Subordinate goals achieved in large-scale, national zones.	Large-scale zones provided more room to define the detailed location of a project.	(x) Amount of land insufficient to meet the 2020 target.	Incomplete generation of knowledge concerning local land-use constraints.
Lower Austria	Long-term energy goal. 3200 MW by 2030 (2020 goal: 1900 MW).	(x) Wind power in 2020 will exceed the medium-term goal.	Zones are dimensioned for the long-term goal and therefore generously sized.	(x) Fewer locations come into consideration. Additional space necessary to achieve the 2030 goal.	Low commitment of affected local authorities in northern zones.
East Flanders	Energy goal but no official time limit. Implementation target is 300 wind turbines.	Not applicable.	Not applicable.	Not applicable.	Mismatch between wind energy policies of Flanders and East Flanders.
Interpretation of case study results:		(x) Achievement of subordinate targets.	Generous zones hence more flexibility in implementation.	(x) Insufficient land availability for the total target.	Limited knowledge about spatial constraints, conflicts of interest between different tiers of government.

SPATIAL STRATEGY Related to territorial goal: resource-aware treatment of land					
	Planning choices	Desired effects	Main drivers	Undesired effects	Main barriers
South Holland	Positive zoning. Large-scale, national zones for wind parks of more than 100 MW and smaller-sized, provincial zones.	Facilitated compact siting of wind turbines.	Establishment of regional wind energy covenants.	(x) Proposed sites in areas where the province has excluded wind energy.	Negative zoning policy abolished during planning process.
Lower Austria	Zones with neutral labelling. ´§19 zones´: wind energy use is basically allowed but not given preferential treatment.	(x) Dismantling of wind turbines in valued landscapes and natural environments.	Not applicable.	Inefficient use of land resources by sprawled development in green areas.	Distance regulation excludes land-use combinations that are more desirable from an environmental perspective.
East Flanders	Positive and negative zoning. Large-scale ´implementation areas´ sub-zoned into ´concentration´ and ´exclusion´ areas.	(x) Coordinated and compact development by competing developers (ME zone).	Cooperation agreement between province and active developers.	One wind energy operator opposes the rules and develops a project outside concentration zones.	Higher-lever Flemish regulations allow wind energy in provincial exclusion zones.
Interpretation of case study results:		Overall, zoning promotes compact development.	Coordination of competing developers' initiatives.	Inefficient use of land resources remains a problem.	Missing criteria for the safeguarding of locally valued landscapes.

SPATIAL STRATEGY Related to social goal: selecting acceptable locations					
	Planning choices	Desired effects	Main drivers	Undesired effects	Main barriers
South Holland	Spatial-geographic criteria. A ´landscape narrative´ defines suitable locations in industrial areas, shore areas and next to transport infrastructure.	Combination with industry is widely supported by wind energy operators.	The open polder landscape is a widely shared value.	Unexpected local opposition in communities neighbouring the Rotterdam port zone.	Little incentive for developers to create support by surrounding population.
Lower Austria	Generic rules. Zones result from excluding controversial areas. A uniform rule establishes large distances to residential land-use.	Bird agency keeps lodging complaints against wind energy projects, but to a much lesser extent.	Bird protection interests investigated during the planning process.	Strong local opposition in northern (forested) locations.	Long distances from residential areas insufficiently aligned with local landscape values.
East Flanders	Spatial-geographic criteria and generic rules. Principle of ´concentration and contrast´: zones in industrial areas and next to transport infrastructure. Minimum distances between zones.	Affected communities support choice of wind energy zones.	Interests of residents investigated during planning process.	E40-Aalter-Aalst zoning plan rejected by Flemish government.	Mismatch between wind energy policies of Flanders and East Flanders.
Interpretation of case study results:		Combination with industry and transport infrastructure is widely supported.	Good knowledge about local concerns is essential.	Regional variations in local attitudes to wind power.	Large distances to residential areas insufficiently respond to local landscape values.

Table 20 and Table 21. Comparison of the effects of governance decisions and their related institutional drivers/barriers within the framework of the three case studies
Note: Effects that are based on expectations are indicated as (x) ; ´not applicable´: effects that cannot be accounted for by interviews.

IMPLEMENTATION STRATEGY Related to maximum and timely implementation goal					
	Planning choices	Desired effects	Main drivers	Undesired effects	Main barriers
South Holland	Proactive attitude. Wind energy covenants with regional and local authorities.	(x) Two covenants will be implemented on time.	Local authorities and other parties cooperate in managing implementation.	One covenant failed, another never came into being.	Local politicians react to declining support by residents.
Lower Austria	Reluctant attitude. Local authorities should decide whether they want wind energy or not.	(x) Relatively successful development in southern and eastern zones.	Not applicable.	Weak commitment of the state to prioritising this type of land use strained relations with wind park developers.	Not applicable.
East Flanders	Pro-active attitude. Cooperation agreements between province and wind park developers that have ground requirements in selected zones.	(x) Successful implementation in Maldegem-Eeklo zone.	Developers were actively consulted.	Not applicable.	Not applicable.
Interpretation of case study results:		Variations in implementation of zoned areas.	Appointed mediators enable collaborative plans by implementation actors.	Not applicable.	Not applicable.

IMPLEMENTATION STRATEGY Related to local participation and compensation goal					
	Planning choices	Desired effects	Main drivers	Undesired effects	Main barriers
South Holland	Reluctant attitude. Environmental management compulsory, but method is left to market players.	Exceptional rather than usual: selected projects with local participation / landscape fund.	Individual communities working to generate local added value from wind energy.	Not applicable.	Largely depended on willingness of wind park developer at the implementation stage.
Lower Austria	Reluctant attitude. Local participation and compensation are left to market players.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
East Flanders	Pro-active attitude. Compensation measures in high-impact areas, minimum share of 20% local participation.	(x) Landscape fund and direct participation achieved in ME zone.	Province invited developers and residents to study devising collective plans. A strategic project provides resources to experiment with participative planning.	Conflicts between wind park developers using different business models; cooperatives exit the sectoral agency.	Not applicable.
Interpretation of case study results:		Not applicable.	Requires much commitment from the planning body concerned.	Not applicable.	Not applicable.

The findings show that, in some instances, regional policies were effective in achieving their aims. In many others, however, they were less effective. Somewhat paradoxically, the expectation was that zoning would provide the necessary land resources for adequate deployment. However, the implementation processes in all case studies show that, despite well-considered plans, an insufficient amount of land was available for the overall target. Furthermore, our case studies show strong regional variation in the implementation process.

Local attitudes to wind energy projects in the identified ´acceptable locations´ varied considerably. In reality, wind power initiatives still encounter unexpected local opposition. But this cannot fully be attributed to 'wrong' land-use decisions: for example, in South Holland the chosen land-use combinations are certainly not undesirable from a local point of view. Wind parks on industrial areas are widely supported. Rather, the problem was that, on the whole, the planning approach created little incentive for developing parties to involve residents at the implementation stage. Experience in East Flanders shows that if regional authorities wish to achieve high participation and compensation standards, this requires much commitment from the planning actors concerned. In the case of Lower Austria, the choice made — siting wind farms on agricultural land — has been particularly contested. This choice was not made on the grounds of landscape considerations, but to safeguard urban expansion on the outskirts of towns. From a social point of view, however, the long distances between wind farms and residential areas are insufficiently aligned with local landscape values and wildlife protection.

If we take a look at territorial goals, results indicate that zoning promotes compact development — if it is combined with rules and practices that lead to collaborative planning efforts by the various local actors involved in implementation (e.g. developers, landowners, residents). In South Holland, despite setbacks in the Rotterdam region, the application of the regional wind energy covenant was rather successful. Similarly, the East Flanders approach, i.e. cooperation agreements with wind energy park developers that had ground requirements, enabled a compact siting of wind turbines. These two strategies went hand in hand with appointed mediators — such as the task group of the East Flanders energy landscape programme or the Rotterdam Port Company — who were able to reconcile higher-level with local interests and promote collaborative plans by implementation actors.

4.2.3 Synthesis: planning approaches and their effectiveness

All three case studies show how governance systems were caught in a lock-in when it came to zoning wind parks. Essential criteria for area selection were agreed at higher governance levels. Once the zones had been identified, they

would quite simply be implemented. In other words, land was earmarked for wind turbines in order to ensure that energy goals would be met. Indeed in all three case studies, the expectation was that by selecting the 'right' locations, implementation would automatically make good progress.

However, once implementation had started, it became obvious that searching for 'alternative' locations would sooner or later be necessary to achieve the targets. The idea that ´the best way to promote the development of wind power is zoning´ was not reciprocated at the local level. Despite tighter regulations, many local communities (still) do not agree with having wind farms in their immediate vicinity.

Unfortunately, the findings show that if regional authorities have to come up with alternative locations, these locations will inevitably lie in areas where, according to previous official communications, wind energy deployment has been forbidden. Consequently, as a planning choice, zoning wind energy can become a deterrent rather than an incentive, having institutionalised expectations about places where wind turbines are allowed and those where they are not.

The main barriers encountered during implementation were related to a lack of congruency between the actions taken by higher-tier and lower-tier authorities. In South Holland and Lower Austria, local willingness to implement wind energy projects turned out to be weaker than expected. In East Flanders, on the other hand, implementation was blocked by a last-minute manoeuvre of the Flemish Region, which disagreed with provincial zoning decisions. Thus, when the motives of higher and lower tiers of government drift apart, implementation inevitably stalls.

The results also clearly illustrate that zoning alone does not guarantee a sufficiently high level of acceptance of wind energy deployment by the local population. It can even lead to the opposite result. In East Flanders, the publication of a map of 'potential implementations areas' gave rise to immediate opposition at first. Residents feared that wind turbines would be everywhere within the highlighted areas. But public attitude changed when the province invited residents to take part in the planning process and state their preferences.

The reconstruction of the three contextual planning arenas shows that exchanges between higher-tier planning parties and local-level implementation actors were rather marginal. In the Lower Austrian case, we might even talk of deliberate non-participation of local actors, since the planning arena was explicitly designed to keep out ´the aggrieved parties´. The expectation was that implementation would be solved by top-down expert decisions. Decision-making clearly lacked the reflexive character for which Healey (1997; 2006) had pleaded in her vision of collaborative practices. In the case of Lower Austria, for instance, the state government criticised large-scale landscape blight through wind turbines but never

reconsidered its spatial strategy, which steered wind energy into green areas, nor did it reconsider its energy policy targets.

Hence, planning activities in all three case studies concentrated on the spatial orchestration of sites — the 'territorial indication' (spatial strategy) — rather than the 'strategy to guide future action' (implementation strategy). The practices that guided implementation, independently from the degree to which formal governance levels tried to intervene in local initiatives in favour of wind energy, were designed to comply with goals set at higher governance levels rather than open them to public debate.

4.3 Implications

This institutional analysis assessed the effectiveness of wind energy zoning decisions and related governance practices in three urbanised regions of Western and Central Europe. The insights gained thanks to the three case studies allow us to make some general observations, both about effectiveness and practices.

In addition, the purpose of this last section is to review some key issues and discuss their implications for further research on the role of spatial planning in the development of renewable energy production, in particular as regards wind power.

4.3.1 Suggestions for action when zoning wind power

The implicit hypothesis of this piece of research was that correlated evidence from the case studies was most likely to be also valid for other regions, i.e. in a comparable institutional setting featuring: the promoting influence of the European Union climate and energy policy, favourable wind conditions, and a high degree of urbanisation. This hypothesis is particularly relevant when it comes to recommendations, raising the following question: to what extent are the 'positively influencing' spatial and governance choices found in the three case study areas transferable?

In order to debate this last question, a feedback workshop was conducted with employees of the Office of the State Government of Upper Austria, in Austria. As in our three case studies, urban sprawl severely constrains wind energy in Upper Austria. There are potential sites on forested hilltops, but these are often locally valued for recreation purposes. At the same time, the state enjoys good climate conditions as regards wind energy generation, which has resulted in growing interest on the part of developers. So far, state policies have been restrictive: neither has the state specified any 2020 goals, nor has it earmarked any land for wind energy.

The text box on the following page documents the outcome of the workshop.

Testing the transferability of planning choices

The feedback workshop to test the transferability of planning choices was organised by the author and took place in the city of Linz in February 2017. The participants were public officials and experts in the fields of energy and environmental planning. They were asked to rate the transferability (rather high, probable, or rather low) of a limited set of planning decisions that had been identified during our case studies as institutional drivers. In addition, experts were to give a reason for their judgement.

According to the participants, the majority of the presented procedural parameters to govern wind power initiatives were indeed ´transferable´ —particularly those measures that were expected to enhance acceptance by the local population. The table below presents the selected spatial and governance choices and their related spatial-organisational units. These ´suggestions for action´ are also *my* recommendations for the various ´planning core actors´, in particular those who represent public interests.

Suggestions for action when zoning wind power derived from the case studies

Planning approach (procedural parameters to govern wind energy)	*Project (wind park)*	Facilitating compact parks through detailed requirements for the setup of wind turbines
	Impact area of a wind park	Requirements for the improvement of the direct surroundings of wind parks Participation standards in project-level planning and financial benefits for residents affected by wind turbines
	Wind energy zone	Signed agreements facilitating coordinated action by developers Mediators or implementation alliances
	Zoning scheme for a part of a region	Regional wind energy covenants Spatial principle of concentration and contrast (compact wind parks, open landscape)
	Zoned areas on regional wind energy planning agendas	Dimensioning of zones according to long-term energy scheme (rather than medium-term 2020 goals) Zoning in phases: from potential implementation areas to detailed zones Positive labelling of zones Framing the policy with a landscape narrative and positive land-use criteria
Planning arena (coalitions, discourses, operating routines)	*Knowledge about implementation requirements*	Inventory of ground requirements (land positions) of locally active developers Strategic projects / programmes to allow ´learning´
	Consensus on implementation goals	Involving ´the affected´ in the planning process early on, open discussion with all representatives of interest groups Memoranda of understanding with implementation actors Energy agreements, coalitions between national authority and regional authorities

The suggestions presented in the text box emphasise the importance of micro-level implementation rules for wind energy zones, projects, and the direct surroundings of a wind park. These include: involvement of the local population in regional planning decisions, requirements for the improvement of areas surrounding wind parks, and stipulations to secure local financial benefits. Regarding higher-tier policies and practices, 'soft' measures that recognise the rhetorical, communicative character of policy and planning were also deemed to be transferable and important, for instance: the positive labelling of zones and associated political commitment to wind power, a more integrative landscape conception promoting the deployment of wind farms through qualitative criteria (e.g. the East Flanders principle of concentration and contrast) and the coupling of planning decisions to a long-term rather than medium-term (2020) renewable energy strategy (e.g. the Lower Austrian energy roadmap). Furthermore, political agreements or coalitions between national and state authorities concerning wind energy targets, as well as agreements or ´memoranda of understanding´ between planning and implementation actors on location policy (e.g. wind energy conventions) were deemed to be highly transferable.

However, the results also show that a reversal of previous spatial decisions, or a paradigm shift, is hardly imaginable in this Austrian state. Upper Austria has neither defined wind energy targets nor zoned areas, but it has institutionalised the practice of siting wind turbines far away from residential land-use through strict distance regulations. As a result, locations other than forested tracts (or other agricultural land) were hard to imagine by the workshop participants, as these would usually be in close vicinity to residential areas. Suggested alternative land-use combinations (as practiced in South Holland and East Flanders), in particular the combination with industrial areas, were therefore rated ´low´ because, as one expert put it, *´the settlement structure in Upper Austria is very fragmented, highways are nearby residential areas and there are hardly any large, contiguous industrial areas.´*

These insights underline the long-term, prevailing influence of planning decisions regarding spatial restrictions for wind power, which is also one of the key conclusions of the comparative case study analysis. Just as in South Holland, East Flanders and Lower Austria, Upper Austria chose its path in allocating wind energy projects long ago, and this path was determined by land-use choices that, at that time, were considered appropriate. In the meantime, regions have failed to reassess or reconsider the consequences of these choices in the light of technological and economic innovation, and in the light of changing societal attitudes. It will therefore not be easy to modify regional planning policies, even in cases where these plans are facing an implementation deadlock.

Concluding this section, the following figure schematically presents three intermediate levels of governance to which, in my opinion, spatial planning should

pay more attention in the future. The suggestions provide for linkages between macro/meso level energy schemes and planning approaches and micro level implementation settings (zones and project-level initiatives).

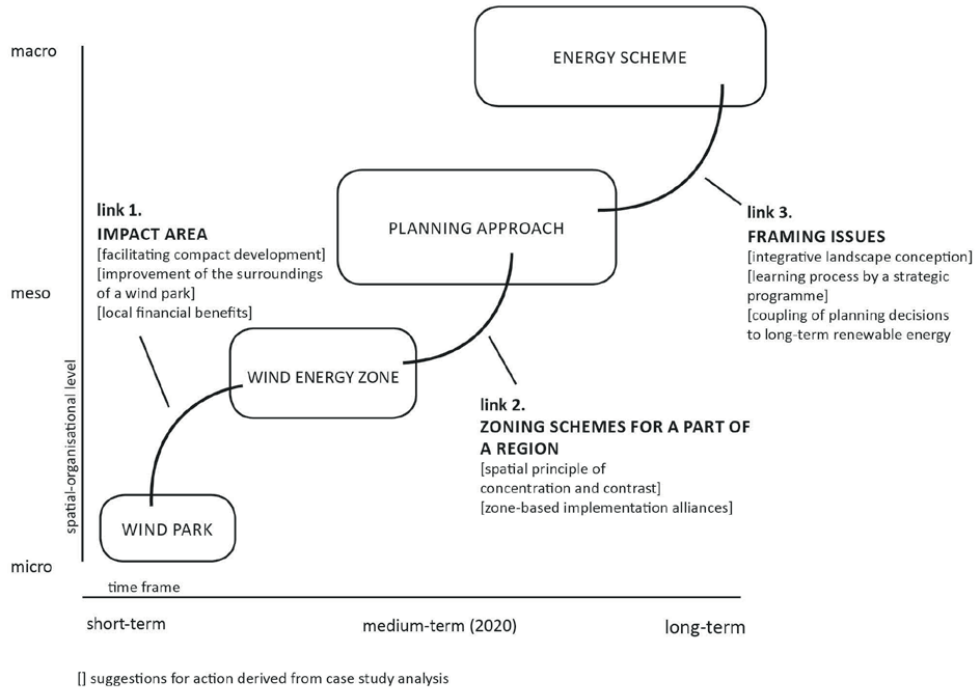

Figure 34. Synthesis: three important interlinkages between planning and implementation when zoning wind power
Figure by the author

4.3.2 Some implications for further research

In all three examined regions, policy-makers were sooner or later confronted with the limited effectiveness of overall, well-considered spatial planning approaches to wind power. What, at the regional level, had been perceived as an innovative plan to combine energy goals with landscape / environmental protection (which are widely supported goals in the planning sector) did not automatically succeed in creating the desired drivers that would motivate local communities to implement projects.

Conversely, planning decisions that largely met with local support were not necessarily compatible with the energy agendas of higher tiers of government. Accordingly, wind power deployment became a task that extended across various spatial-organisational levels and, at each level, gave rise to different perspectives

on (desired or undesired) impacts. In this sense, implementation of the three investigated spatial planning policies was not held back by 'ineffective' planning decisions. Rather, the overall issue was that decisions taken at the planning level insufficiently addressed the concerns of various actors affected by implementation. One of the interviewed experts puts this experience in a nutshell:

> *It was very naïve to think we could make a policy that would determine where wind power would be located and where it would not — and that this would work. Even if we do manage to select the right locations, without working on the involvement of residents with wind turbines, we cannot succeed.*
> *(Expert 13, administration, 2016)*

This candid interview statement refers to the much-cited resistance from the local population. In a broader sense, however, it can also be interpreted as showing that the examined spatial and governance strategies for wind energy deployment have reached the limits of classical-modernist practices; in particular, this concerns the institutionalised processes that frame decision-making about wind energy locations. There are at least two types of limits that are interesting for further research and these will be discussed in the following paragraphs: (1) reliance on a confined circle of experts and the assumption that zoning leads to a successful implementation and, (2) the limited capacity to reflect on, and adjust established practices.

The first limitation of current practice has to do with the decision-making mechanisms that were used to define wind power zones. The case study results indicate that planning decisions were largely made on the basis of consultation between national or regional authorities and selected experts, who represented the concerns of higher governance levels. Altogether, there was little exchange with the much broader, regionally-varying spectrum of actors who were actively involved in the implementation of projects, for instance: local politicians, private landowners, wind power developers with diverging business models, industry associations, agricultural associations, local residents' initiatives, recreation seekers, or nature protection NGOs. Generally speaking, the concerns of such actors go beyond territorial (resource-aware) considerations of efficient siting — they are largely motivated by contextual, economic, and social circumstances.

The second limitation of current practice, which has implications for further research, concerns another recurring theme of the analysis, namely long-term, established land-use restrictions in regional planning affecting wind power deployment. These restrictions are based on fundamental decisions that over the years have never been reconsidered. During the same period, however, considerable economic, technological, and social changes have taken place in and around the wind energy sector. This 'reform resistance' of planning decisions can have unintended side-effects, since it brings with it the risk that technological and social innovations will insufficiently be taken into account. Thus, new approaches

that, over time, might be better aligned with the changing context or changing objectives of renewable energy deployment may well be overlooked.

In conclusion, the above considerations may suggest that the assessment of spatial policies concerning renewable energy should not be limited to identifying those criteria that make wind power zones work as a 'consensus-building device'. Assuming that there are very different patterns at the local level as regards the targets being pursued through wind power deployment, the evaluation of 'effectiveness' could be approached from a different, perhaps more constructive, angle than the 'achieving' or 'not-achieving' of goals.

That is to say, it could be approached from the following perspective: the definition of zoned areas may provide a fertile ground for a directed exchange of views, i.e. the societal exploration of renewable energy issues, which would eventually motivate local communities to wholeheartedly implement projects. In this sense, the outlining of wind power zones is not just a technical act that determines the territorial spread of wind turbines. Rather, it configures social-organisational entities in which regionally-varying sets of planning and/or implementation actors interact and, in the best case, join forces.

A crucial advantage of the spatial-geographic approach to zoning — in comparison with more neutral approaches such as distance regulations or land-use criteria — is that by dealing with the question of ´acceptable locations´ it provides spatial planning with opportunities to facilitate local cooperation around wind power. The results of this analysis thereby suggest the formation of zone-based implementation alliances that would mediate between project-level interests and wider, area-based social concerns. In the light of post-2020 renewable energy growth, innovation in planning practices along this path will be necessary. In this way, hopefully, a more fruitful exchange can take place between planning and implementation, allowing 'collective' concerns at higher governance levels to re-frame local action as well as enabling local concerns to reshape higher-tier practices.

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Interviews, conversations, lectures and workshops

(Actor dimension in brackets)

Interviews

Expert 01, landscape architect (administration), 2016. Interviewed by the author. The Hague, 10 March 2016.

Expert 02, urban planner (mediators), 2016. Interviewed by the author. Delft, 11 March 2016.

Expert 03, public administration specialist (administration), 2016. Interviewed by the author. Utrecht, 15 March 2016.

Expert 04, spatial planner (mediators), 2016. Interviewed by the author. Vienna, 17 March 2016.

Expert 05, manager (politics), 2016. Interviewed by the author. Rotterdam, 21 March 2016.

Expert 06, sociologist (administration), 2016. Interviewed by the author. The Hague, 31 March 2016.

Expert 07, legal expert (administration), 2016. Interviewed by the author. The Hague, 31 March 2016.

Expert 08, legal philosopher (administration), 2016. Interviewed by the author. The Hague, 31 March 2016.

Expert 09, spatial planner (mediators), 2016. Interviewed by the author. Vienna, 5 April 2016.

Expert 10, energy economist (administration), 2016. Interviewed by the author. St. Pölten, 28 April 2016.

Expert 11, spatial planner (administration), 2016. Interviewed by the author. St. Pölten, 28 April 2016.

Expert 12, landscape architect (mediators), 2016. Interviewed by the author. Brussels, 11 May 2016.

Expert 13, spatial planner (administration), 2016. Interviewed by the author. Ghent, 20 May 2016.

Expert 14, psychologist (administration), 2016. Interviewed by the author. Ghent, 20 May 2016.

Expert 15, spatial planner (administration), 2016. Interviewed by the author. Ghent, 20 May 2016.

Expert 16, communication expert (economy), 2016. Interviewed by the author. Vienna, 8 June 2016.

Expert 17, biologist (mediators), 2016. Interviewed by the author. Vienna, 14 June 2016.

Expert 18, communication expert (economy), 2016. Interviewed by the author. The Hague, 28 September 2016.

Expert 19, manager (economy), 2016. Interviewed by the author. Rotterdam, 5 October 2016.

Expert 20, pedagogue (economy), 2016. Interviewed by the author. Brussels, 28 October 2016.

Conversations

Expert 21, spatial planner (administration), 2015. Burgenland, Regionales Rahmenkonzept für Windkraftanlagen. [Conversation] documented by the author. Vienna, 16 April 2015.

Expert 22, environmental planner (administration), 2015. Windkraftmasterplan Oberösterreich. [Conversation] documented by the author. Linz, 15 September 2015.

Expert 23, wind energy operator (economy / civil society). [Conversation] guided tour of Sternwald wind park organised by the Technical University of Vienna and documented by the author. Vorderweißenbach, 16 September 2015.

Expert 24, politics (politician). [Conversation] guided tour of Munderfing wind park organised by the Technical University of Vienna and documented by the author. Munderfing, 17 September 201

Lectures

Expert 25, wind energy operator (economy / civil society). Energy Cooperation Deltawind. [Lecture] organised by the Netherlands Wind Energy Association and documented by the author. Goeree-Overvlakkee, 13 June 2015.

Expert 26, energy planner (economy), 2015. [Lecture] organised by the Technical University of Vienna and documented by the author. Munderfing, 17 September 2015.

Workshops

Office of the State Government of Upper Austria, 2017. Reflexionsworkshop Dissertation Pia Nabielek. [Workshop] organised by the author in collaboration with the Office of the State Government of Upper Austria (Directorate of Environment and Water Management) and documented by the author. Linz, 16 February 2017.

Appendix

A. Interview questions

1. Position

1.a Please describe your position, organisation and professional skills (education) related to [policy].

2. Conditions

2.a What were the most important conditions/influencing factors that led to the [policy]*?*

3. Planning Arena

3.a Who (persons/organisations at national / provincial / local levels) participated in the development of the [policy] *and who had the power to take decisions? How did these parties come to decisions?*

3.b Which communication format was used to work with these persons/organisations and what was [your contribution/the contribution of other persons/organisations]*? Were there any conflicts?*

3.c How intensive was [your participation / the participation of other persons/organisations] *in the planning process for the* [policy]*?*

3.d Which variations/choices were discussed during the development of the [policy]*? E.g. spatial concepts such as clustering and dispersion, variations in formalizing zones for wind energy, land-use constraints and combinations.*

3.e What knowledge was generated during the planning process [e.g. assessment of energy resources, surveys concerning social acceptance of wind energy]? Why was it necessary to produce information? How would you describe the quality of the information?

4. Planning Approach

4.a What qualitative and quantitative criteria characterise the current planning approach to wind energy [policy]*? Related to: energy goals, public support, landscape and environmental goals.*

4.b Since when has the [policy] *been implemented?*

5. Outcome

5.a How successful has the implementation of the [policy] *been so far? What goals have been achieved? Related to: energy goals, public support, landscape and environmental goals.*

5.b What factors have influenced the achievement of these goals in a positive / negative way (drivers and barriers)?

5.c Did the implementation process lead to an amendment of the [policy]*? Do you expect an amendment/update of the* [policy] *in the coming years? Why?*

5.d Is wind energy implementation being monitored and, if so, how does it work?

B. Documentation of case studies

Timeline of wind energy policies in South Holland

(Spatial-organizational level in brackets)

Before 2009
2001: First wind energy covenant Port of Rotterdam (micro)
2003: South Holland Wind Energy Policy Plan *Nota Wervel* (meso)
2008: Adoption of regional climate agenda by Rotterdam city region (micro)

Planning phase 1: 2009-2011
From general rules to a spatial-geographic planning approach
2009: Directive 2009/28/EC, National Renewable Energy Action Plan of the Netherlands (macro)
2009: Amendment to Dutch Electricity Act (macro)
2009: Second wind energy covenant Port of Rotterdam (micro)
2011: South Holland Wind Energy Policy Plan *Nota Wervelender* (meso)

Planning phase 2: 2012-2014
Earmarking land for wind energy targets
2012: National Policy for Infrastructure and Spatial Planning (macro)
2012: Wind energy covenant Rotterdam City Region (micro)
2013: Dutch Energy Agreement (macro)
2014: National Structure Plan for Onshore Wind Energy (macro)
2014: South Holland Structure Plan (meso)

Timeline of wind energy policies in Lower Austria

(Spatial-organizational level in brackets)

2002: Wind energy zones in Burgenland (meso)

Planning phase 1: 2003-2004
Creating generic distance rules
2003: (until 2008) *Kleinräumliche Konzepte* (small-scale spatial schemes) (micro)
2004: minimum distances in Lower Austrian Spatial Planning Act of 1976 adopted (meso)

2009: Directive 2009/28/EC, National Renewable Energy Action Plan of Austria (macro)
2011: Spatial Development Scheme of Austrian Conference of Spatial Planning (macro)
2011: Lower Austria Energy Roadmap (meso)
2012: Green Electricity Act (macro)

Planning phase 2: 2013-2014
Earmarking land for wind energy targets
2014: Lower Austrian spatial planning ordinance for wind energy utilisation (meso)

Timeline of wind energy policies in East Flanders

(Spatial-organizational level in brackets)

1997: Flemish spatial structure plan (macro)
2000: First circular letter on wind energy (macro)
2003: (until 2009) GRUPs regional implementation plans for wind energy (macro)
2005: East Flanders environmental policy plan (meso)
2006: Second circular letter on wind energy (macro)

Planning phase 1: 2007-2009
From general rules to implementation areas
2009: Directive 2009/28/EC, National Renewable Energy Action Plan of Belgium (macro)
2009: East Flanders Wind Energy Policy Plan (*Addendum aan het PRS: Provinciaal Beleidskader Windturbines*) (meso)
2009: Flemish energy vision *Vlaanderen in Actie* (macro)
2009: Amendment to Flemish Spatial Planning Act (*clichering*) (macro)

Planning phase 2: 2010-2014
Earmarking land for wind energy
2014: East Flanders Implementation Plans for wind energy in the Maldegem-Eeklo and E40-Aalter-Aalst areas (meso)

Documentation interview statements desired and undesired effects

Table 22. Longlist of desired and undesired effects of planning choices in South Holland, Lower Austria and East Flanders mentioned by interviewed experts.

[+]desired [-]undesired	Effect	South Holland	Lower Austria	East Flanders
	Effects of spatial strategy **Goal: ECONOMIC — space for wind energy targets**			
[+]	Earmarked land spacious enough to implement important sub-targets	(x)	(x)	(x)
[-]	Earmarked land turns out to be insufficient in relation to adopted total target	x	(x)	(x)
[-]	Desired capacity installed (MW) severely reduced by unexpected technical constraints	x		
[-]	Lack of clarity concerning land availability			x
	Effects of spatial strategy **Goal: TERRITORIAL — resource-aware treatment of land**			
[+]	Synchronized wind initiatives – concentrated siting of wind parks in positive zones	x		x
[+]	Dismantling of wind turbines located outside positive zones		(x)	
[-]	Wind energy development outside positive zones is still possible	(x)		x
[-]	Selected zones were abolished shortly after their adoption, procedure of re-planning is in progress	x		x

[+]desired [-]undesired	Effect	South Holland	Lower Austria	East Flanders
	Effects of spatial strategy **Goal: SOCIAL — selecting accepted locations**			
[+]	Land-use combinations widely supported by wind energy sector	x		x
[+]	Land-use combinations resulted in fewer conflicts with environmental NGOs		x	
[-]	Lack of commitment by affected municipalities to implementing wind energy	x	x	x
[-]	´Big bad wolf´ effect: local prejudice against wind energy operators	x		x
[-]	Land-use constraints exclude areas where wind energy developments would most likely be accepted		(x)	
[-]	Land-use combinations conflict with landscape and environmental protection interests		x	
[-]	Failed consensus on land-use constraints between national/regional authority and state/province			x
	Effects of implementation strategy **Goal: maximum and timely implementation**			
[+]	Has led to an annual increase of wind energy (capacity installed)	x		x
[+]	Increased competition for sites between wind energy initiatives		x	x
[-]	Considerable variation in implementation progress per zone/region	x	x	x
[-]	Inconsistent procedures of permit-giving authorities	x	x	x
[-]	Abolishment/Failed conclusion of regional wind energy plans	x	x	x
	Effects of implementation strategy **Goal: local participation and compensation**			
[+]	Has promoted local compensation of negative impacts		x	x
[+]	Has promoted participation of local residents affected by development			x
[-]	Great variation in the extent to which wind energy operators facilitate local participation and compensation	x	x	

x observed effect

(x) effect expected in the opinion of interviewed experts

C. Documentation of workshop results

Table 23. Workshop results concerning the evaluation of the transferability (rather high, moderate, rather low) of drivers identified in three case studies

Planning choices that had a positive effect in the case studies	
Transferability: rather high	**Driver relates to**
Strategic environmental assessment of zones	Planning arena
Involving ´the affected´ in the planning process early on, open discussion with all representatives of interests	
Positive labelling of zones as ´suitable areas´	Spatial strategy
Dimensioning of zones according to long-term energy goals rather than 2020 goals	
Framing the policy with a landscape narrative and positive land-use criteria	
Spatial principle of concentration and contrast (compact wind parks, open landscape)	
Detailed requirements for the setup of wind turbines	
Agreements, coalitions between national authority and state authorities	Implementation strategy
Regional wind energy covenants, installing zone managers	
Requirements for the improvement of the direct surroundings of wind parks	
Participation standards in project-level planning and financial benefits for residents affected by wind turbines	
Transferability: moderate	**Driver relates to**
Inventory of ground requirements of locally active developers	Planning arena
Zoning in phases: from potential implementation areas to detailed zones	
Fast-lane permit procedure for strategic projects	Implementation strategy
Transferability: rather low	**Driver relates to**
Few, generous concentration zones instead of many, smaller zones	Spatial strategy
Land-use combination with industrial area or transport infrastructure	
State authority is empowered to deliver permits to wind parks.	Implementation strategy

Curriculum Vitae

P.C. Nabielek [Pia]
d.o.b. 03-12-1974
languages: German (native speaker), Dutch (fluent), English (fluent), French (basic)

Area of expertise
Spatial planning, urban design, institutional analysis, comparative policy studies, climate/energy planning

Professional experience
2014 – 2018
- PhD candidate, Doctoral College EWARD [*Energy and Resource Awareness in Urban and Regional Development*], Department of Spatial Planning, Technical University of Vienna.

2017
- Researcher, PBL Netherlands Environmental Assessment Agency in The Hague.

2014 – 2017
- Researcher/Teacher, Centre of Regional Planning and Regional Development, Department of Spatial Planning, Technical University of Vienna.

2009 – 2014
- Self-employed work for the City of Rotterdam. Flood risk adaptation policies in the region of Rotterdam-Rijmond, co-funded by the Dutch Climate Fund and commissioned by the City of Rotterdam.

2006 – 2009
- Researcher, PBL Netherlands Environmental Assessment Agency in The Hague.

2002 – 2006
- Designer at architectural and urban design practices based in Rotterdam.

Education
- Dipl.-Ing. [engineer diploma, equivalent to M.Sc.], Technical University of Vienna, Faculty of Architecture and Spatial Planning, Department of Architecture. Graduation year: 2002
- 2001: Ecole nationale supérieure d´architecture et de paysage de Bordeaux.
- 1999 – 2000: Delft University of Technology, Faculty of Architecture.

Teaching experience
2014 – 2017, Lecturer, Technical University of Vienna
- 2014/2015WS Course 280.462 Foundations of energy spatial planning.
- 2015/2016WS Course 280.429 Spatial Planning Themes, introduction to energy planning.
- 2016SS Course 280.277 Planning for Agglomerations.
- 2016/2017SS Course 280.165 Visioneering of Regions.

Other activities
2003 – present
- Member of YEAN, Network of Research Studies, awarded 2011 by the Austrian Building Price for organisations and networks.