INTERNATIONAL ENERGY AGENCY

Implementing Agreement for Co-operation in the Research, Development and Deployment of Wind Turbine Systems
Task 11

IEA R&D Wind Task 11 - Topical Expert Meeting

"Social Acceptance of Wind Energy Projects"

Hotel Elite

Rue de la Gare, Rue de la Gare 14, 2501 Biel, Switzerland

June 14th to 16th, 2012

Picture: AlbertJansen (The Netherlands)

Organized by:

ENCO Energie-Consulting AG, Switzerland.

Scientific Co-ordination:

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Wind Farm Inauguration of citizens cooperative near Tokyo

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International Energy Agency

Implement Agreement for Co-operation in the Research, Development and Deployment of Wind Turbine Systems: IEA Wind

The IEA international collaboration on energy technology and RD&D is organized under the legal structure of Implementing Agreements, in which Governments, or their delegated agents, participate as Contracting Parties and undertake Tasks identified in specific Annexes.

The IEA's Wind Implementing Agreement began in 1977, and is now called the Implementing Agreement for Co-operation in the Research, Development, and Deployment of Wind Energy Systems (IEA Wind). At present, 24 contracting parties from 20 countries, the European Commission, and the European Wind Energy Association (EWEA) participate in IEA Wind. Australia, Austria, Canada, Denmark, the European Commission, EWEA, Finland, Germany, Greece, Ireland, Italy (two contracting parties), Japan, the Republic of Korea, Mexico, the Netherlands, Norway (two contracting parties), Portugal, Spain, Sweden, Switzerland, and the United States are now members.

The development and maturing of wind energy technology over the past 30 years has been facilitated through vigorous national programs of research, development, demonstration, and financial incentives. In this process, IEA Wind has played a role by providing a flexible framework for cost-effective joint research projects and information exchange.

The mission of the IEA Wind Agreement continues to be to encourage and support the technological development and global deployment of wind energy technology. To do this, the contracting parties exchange information on their continuing and planned activities and participate in IEA Wind Tasks regarding cooperative research, development, and demonstration of wind systems.

Task 11 of the IEA Wind Agreement, Base Technology Information Exchange, has the objective to promote and disseminate knowledge through cooperative activities and information exchange on R&D topics of common interest to the Task members. These cooperative activities have been part of the Wind Implementing Agreement since 1978.

Task 11 is an important instrument of IEA Wind. It can react flexibly on new technical and scientific developments and information needs. It brings the latest knowledge to wind energy players in the member countries and collects information and recommendations for the work of the IEA Wind Agreement. Task 11 is also an important catalyst for starting new tasks within IEA Wind.

IEA Wind TASK 11: BASE TECHNOLOGY INFORMATION EXCHANGE

The objective of this Task is to promote disseminating knowledge through cooperative activities and information exchange on R&D topics of common interest. Four meetings on different topics are arranged every year, gathering active researchers and experts. These cooperative activities have been part of the Agreement since 1978.

Two Subtasks

The task includes two subtasks.

The objective of the first subtask is to develop recommended practices (RP) for wind turbine testing and evaluation for each topic needing recommended practices. In June 2011 was edited the RP on "Consumer Label for Small Wind Turbines". A new RP about "Performance and Load Conditions of Wind Turbines in Cold Climates" is expected to be edited this year.

The objective of the second subtask is to conduct topical expert meetings in research areas identified by the IEA R&D Wind Executive Committee. The Executive Committee designates topics in research areas of current interest, which requires an exchange of information. So far, Topical Expert Meetings are arranged four times a year.

Documentation

Since these activities were initiated in 1978, more than 68 volumes of proceedings have been published. In the series of Recommended Practices 11 documents were published and five of these have revised editions.

All documents produced under Task 11 and published by the Operating Agent are available to citizens of member countries participating in this Task.

Operating Agent

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COUNTRIES PRESENTLY PARTICIPATING IN THE TASK 11	
COUNTRY	**INSTITUTION**
Canada	National Resources Canada
Denmark	Danish Technical University (DTU) - Risø National Laboratory
Republic of China	Chinese Wind Energy Association (CWEA)
European Commission	European Commission
Finland	Technical Research Centre of Finland - VTT Energy
Germany	Bundesministerium für Unwelt , Naturschutz und Reaktorsicherheit -BMU
Ireland	Sustainable Energy Ireland - SEI
Italy	Ricerca sul sistema energetico, (RSE S.p.A.)
Japan	National Institute of Advanced Industrial Science and Technology AIST
Republic of Korea	POHANG University of Science and Technology - POSTECH
Mexico	Instituto de Investigaciones Electricas - IEE
Netherlands	SenterNovem
Norway	The Norwegian Water Resources and Energy Directorate - NVE
Spain	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas CIEMAT
Sweden	Energimyndigheten
Switzerland	Swiss Federal Office of Energy - SFOE
United States	The U.S Department of Energy -DOE

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INTRODUCTORY NOTE

a. IEA Wind Task 28.

IEA Wind Task 28 was founded around 2008 when wind energy development was stopped or extremely slowed down in several IEA Wind countries by strong opposition and media debates. Today, the industry has strongly grown and the capacities in all countries have increased. However, looking at the struggles still encountered in many countries and at the challenges ahead – e.g. concerning the importance of wind power for the global and national energy policies - many countries will need to invest in social acceptance measures to be able to put into operation the required capacities. IEA Wind Task 28 can support these policies by exchanging good examples, by connecting researcher, administrations, politicians, associations and practitioners from various countries and by disseminating lessons learned in presentations, publications and web contributions.

Some of the dissemination activities of the last three years include:

- Web site including a web data base of social acceptance projects and publications (www.socialacceptance.ch)
- Participation at the annual EWEA conference
- Presentations of working group members at national and international expert gatherings
- Articles e.g. in national branch magazines and peer reviewed journals, interviews
- National expert meetings (organized in connection with working group meetings; US 2009, Dublin 2010, the Netherlands and Norway 2011).

b. Scope of IEA Wind Task 28 and its second period 2012-2014

Three years of experience within the working group and supporting institutions of IEA Wind Task 28 on social acceptance of wind energy have shown the international exchange on social acceptance issues to be extremely valuable for those involved such as administrations, the research community, IEA Wind members and for further wind energy promoters in the respective countries, e.g. wind energy associations. The development of wind energy - respectively the debates surrounding the projects in the field - have also proven that social acceptance is a topic to be further deepened if the policy targets for renewable energy production are to be accomplished: specific projects require social acceptance to be realized and proponents and opponents need support to work together to improve the projects. This seems to be increasingly recognized by industry as well as administrative institutions, but to

achieve long-term acceptance of wind power, the topic needs further attention and escorting projects such as Task 28 with their interdisciplinary and trans-national approach.

The work of Task 28 should therefore be continued in 2012 and following years on the basis of the topics identified as crucial to social acceptance, the international exchange within IEA Wind and dialogue with the various stakeholders.

The main areas of the future work of Task 28 proposed for the next period can be summarized as follows:

- Measurement and monitoring resp. quantification / valuation, assessment of the magnitude of the issue and tracking of developments
- Support for the establishment of policies and standards; successful supporting structures
- Discussion of current and new issues influencing social acceptance that are being debated in the participating countries and stressing of research gaps
- Deduction / dissemination of the lessons learned, good practices, successful strategies etc.

Taking into account the importance of wind energy development not only in industrial, but also in developing countries, the participation of further IEA Wind countries is encouraged for the new period.

Task 28 deliver overviews on the issue of social acceptance in various countries and provide inputs for national legislation and implementation based on experience from other regions. The network of international experts, assist the participating countries in developing their knowledge and provide possibilities to sensitize experts and practitioners on the issue of social acceptance. The awareness on the importance of social acceptance of wind power and the knowledge on successful strategies improve wind projects in the participating countries.

C. Aim, Audience

The TEM#70 on Social Acceptance in 2012 serve:

- as a “success control” of the first phase: feedback to results and the final report of IEA Wind Task 28
- as a discussion of issues and targets for the second phase: issues to be elaborated, State-of-the-Art in the countries and disciplines present at the TEM, Good Practices from the various backgrounds.

The focus lies on the improvement of social acceptance of wind energy projects, but also include aspects of acceptance of transmission infrastructure.

The audience for this workshop includes:

- IEA Wind Task 28 working group members and national experts from its network
- Researchers, experts and practitioners from IEA Wind countries and countries interested in participation in the second phase of IEA Wind Task 28
- Experts on Social Acceptance issues from non-IEA Wind-countries such as France, Eastern Europe, Asia, and South America

The outcome of the workshop is a document or a proceeding of the workshop which will include:

- A summary of the workshop
- Presentations by participants
- A compilation of topics that are crucial for future development of foundation structures

d. Agenda

Thursday 14th June

9:00 **Registration**. Collection of presentations

9:30 **Introduction by Host**
Robert Horbaty, ENCO Energie-Consulting AG, Switzerland

09:45 **Recognition of Participants**

10:00 **Introduction by Task 11 Operating Agent.**
Felix Avia, Operating Agent Task 11 IEAWind R&D

10:20 **Overview Social Acceptance of Wind Energy Projects / Task 28**
Robert Horbaty / Stefanie Huber, ENCO Energie-Consulting AG, Switzerland

● ***10:45 Short Coffee Break***

1st Session Individual Presentations:

11:00 **Wind power and renewable energy as community power: local contexts and reflective planning**
Mr. Shota Furuya, Institute for Sustainable Energy Policies, Japan

11:20 **Code of Conduct for the Swedish Windpower Industry**
Mr.Tomas Söderlund, PowerQuest Sweden

● ***12:00 Lunch***

SWISS EXPERT SESSION

13.00 **Welcome of the city of Biel** *B. Schwickert*

Introduction to the programme *R. Rigassi*

1st part: **How to win a majority for your wind project**

13.20 30 years of experience with citizen deliberation

Albert Jansen, Agentschap NL, Netherland

13.40 Social Acceptance of Wind – a Project Delivery Perspective

Jim Gannon, West Pier Business Campus, Ireland

14.00 Acceptance despite difficult circumstances

Walter Schmied, Directeur développement de ennova SA, Switzerland

o *Coffee break incl. topic oriented discussion at bistro tables*

15.10 Key conclusions of the discussions

2nd part: **Structural and general conditions for social acceptance**

15:30 Wind Turbine Secretariat as interface between ministry and citizens

Jens Poulier, The WT Scrt. - Danish Ministry of The Environment, Denmark

15:50 Switzerland: Planning and approval procedures – chances and risks

Markus Geissmann, Renewable Energies Section, Swiss Federal Office of Energy, Switzerland

16:10 Questions / Discussion

16.30 End – following aperitif

Friday 15th June

8:45 **Registration NEW participants**. Collection of presentations

9:00 **Review day one / introduction day two by Host**
Robert Horbaty, ENCO Energie-Consulting AG, Switzerland
Felix Avia, Operating Agent Task 11 IEAWind R&D

2n Session Individual Presentations

09:10 **How is Public Acceptance of Wind Facilities Priced into the Housing Market? Preliminary New Results from Northeast US Markets.**
Mr. Ben Hoen, Lawrence Berkely National Laboratory, USA

09:30 **Wind energy and local development: an Italian way to social acceptance**
Ms. Cristina M. Cavicchioli, RSE spa - Ricerca sul sistema energético, Italy

09:50 **Social Acceptance of Wind Energy after Fukushima: Sociopolitical Changes and Problems**
Dr. Yasushi Mruyama, Nagoya University, Japan

10:10 **Farming wind in a city**
Ms. Sari Janhunen, South Karelian Institute, Lappeenranta Univ. of Technology, Finland

●***10:30 Coffe Break***

11:00 **Quantifying the Impacts of Deployment Barriers to Wind Power in the United States**
Mr. Eric Lantz, National Renewable Energy Laboratory, USA

11:20 **Stress impact of wind mills: obstruction markings**
Ms. Gundula Hübner, Martin-Luther-University Halle-Wittenberg, Germany

11:40 **Wind Turbine Architectural Design for Improved Social Acceptance**
Dr Anna P Gawlikowska, ETH Zürich, Switzerland

12:00 **Conflict around the location of a national WT test center**
Kristian Borch, Technical University of Denmark, Denmark

●***12:30 Lunch***

14:00 Learning from Wind? Insights for other Renewable Technologies
Geraint Ellis, Queen's University Belfast, Ireland

14:20 Place Attachment and Procedural Justice..
*Jan Hildebrand***,** *Forschungsgruppe Umweltpsychologie, Universität des Saarlandes, Germany*

15:00 Summary of Meeting

15:30 End of the meeting

- ***16:00-22:30 Optional tour to the "Mont Croisin" wind park***

Saturday 16th June

For participants from IEA Wind countries (already participating or intending to participate in IEA Wind Task 28)

Task 28 "Kick-off meeting"

Moderation: Robert Horbaty and Stefanie Huber, ENCO Energie-Consulting AG, Switzerland

09:00 Opening, Agenda, Attendees

09:20 Administrative issues Task 28 / Introduction second period

09:40 Opening, Agenda, Attendees

1st round of short country inputs:

10:00 What is the value of exchange in Task 28 for your countries? What do you resp. your country expect from future participation in IEA Wind Task 28? What issues shall be discussed?

- ***10:30 Coffe Break***

2nd round of short country inputs:

11:00 What is the value of exchange in Task 28 for your countries? What do you resp. your country expect from future participation in IEA Wind Task 28? What issues shall be discussed?

11:30 Plenary discussion on targets and aims of IEA Wind Task 28 2nd period 2012-2015

●***12:30 Lunch***

13:30 State-of-the-Art / Good practice

Work in groups to discuss experience from the various countries and disciplines,
current projects and successful strategies by participants
eventually short plenary presentations

15:30 Organization of work in IEA Wind Task 28 / next meeting

Outlook, homepage, reports, web meetings, next meeting

16:00 End of the meeting

e) List of participants

	Name	Prename	Organization	Country
Mr.	Avia	Felix	Operating Agent Task 11	Spain
Dr.	Baba	Kenshi	Central Research Institute of Electric Power Industry	Japan
Mr.	Borch	Kristian	Technical University of Denmark	Denmark
Ms.	Cavicchioli	Cristina M.	RSE spa - Ricerca sul sistema energetico	Italy
Mr.	Furuya	Shota	Institute for Sustainable Energy Policies	Japan
Mr.	Gannon	Jim	West Pier Business Campus	Ireland
Dr	Gawlikowska	Anna	ETH Zürich	Switzerland
Mr.	Geissmann	Markus	Swiss Federal Office of Energy	Switzerland
Mr.	Herzog	Oliver	Informatik Herzog GmbH	Switzerland
Mr	Hildebrand	Jan	Saarland University	Germany
Mr.	Hoen	Ben	Lawrence Berkely National Laboratory	USA
Mr.	Horbaty	Robert	Operating Agent	Switzerland
Ms.	Huber	Stefanie	Operating Agent	Switzerland
Ms.	Hübner	Gundula	Martin-Luther-University Halle-Wittenberg	Germany
Mr.	Huismans	Gé	Agentschap NL	Netherlands
Ms.	Janhunen	Sari	South Karelian Institute, Lappeenranta University of Technology	Finland
Mr	Jansen	Albert	Agentschap NL	Netherlands
Ms.	Jegen	Maya	Université du Québec à Montreal	Canada
Mr.	Lantz	Eric	National Renewable Energy Laboratory	USA
Ms.	Meyer	Andrea	Federal Ministry for the Environment	Germany
Mr.	Pouplier	Jens	The Wind Turbine Secretariat of the Danish Ministry of The Environment	Denmark
Mr.	Rahbek	Arne	Vattenfall Wind Power Denmark	Denmark
Mr.	Rigassi	Reto	Suisse Eole	Switzerland
Mr.	Söderlund	Tomas	PowerQuest	Sweden
Dr.	Yasushi	Maruyama	Nagoya University	Japan

f) Summary

The meeting started on Thursday morning 14th June. At afternoon a Swiss expert session was organized together with the Swiss Wind Energy Association Suisse Eole. Saturday, was the "kick-off" meeting of the extension period of IEA Wind Task 28. Annex I presents the extension proposal of Task 28 and minutes of the kick-off meeting are included in Annex II.

26 participants from 11 countries (Switzerland, Canada, Denmark, Finland, Germany, Italy, Ireland, Japan, Netherlands, Sweden, and USA), attended the meeting. 20 other participants attended the Swiss Expert Day meeting.

The participants represented a great variety of stakeholders related to the topic. Those were: manufacturers, wind farm operators, research organizations, universities and consultants. A total of 19 presentations were given.

Following the two days of presentations the floor was opened and a general discussion took place, discussing the results of IEA Wind Task 28. Issues to be addressed in the second period were identified.

ANNEX I:

Task 28 – Social acceptance of wind energy
Extension proposal

International Energy Agency (IEA)
Implementing Agreement for Co-operation in the Research and Development of Wind Energy Systems (IEA Wind)

Annex 28 – Social acceptance of wind energy
Extension proposal

August 2012

Operating Agent
Robert Horbaty / Stefanie Huber

With contributions of IEA Wind Task 28 working group members, with a special thank to Eric Lantz, NREL, US

1 Scope and added value

Three years of experience within the working group and supporting institutions of IEA Wind Task 28 on social acceptance of wind energy have shown international exchange on social acceptance issues to be exceptionally valuable for those engaged in the work of the task, including, government administrators, the research community, IEA Wind members and the wind energy industry in the respective countries (e.g., wind energy associations). The development of wind energy – more specifically, the debates surrounding projects in the field - have also shown that social acceptance is a topic that needs to be better understood if the various policy targets for renewable energy production are to be accomplished. Individual projects require public approvals to be realized; proponents and opponents need to work together to improve projects. Such trends appear to be increasingly recognized by industry, government, and research institutions. To achieve long-term acceptance of wind power, the topic requires further attention and examination, e.g. in terms of “quantification” or “monitoring”, by efforts such as Task 28 with their interdisciplinary and trans-national approach.

The work of Task 28 should therefore be continued in 2012 and following years on the basis of the topics identified as crucial to social acceptance, the international exchange within IEA Wind and dialogue with the various stakeholders.

The main areas of the future work of Task 28 proposed for the next period can be summarized as follows:

- Measurement and monitoring of social acceptance
- Documentation of existing policies and standards that have been demonstrated to increase social acceptance
- Discussion of current and new issues influencing social acceptance that are being debated in the participating countries, stressing of research gaps and discovering of opportunities for joint research
- Deduction, documentation, and dissemination of the lessons learned, good practices, successful strategies etc. with the aim of improving projects and their implementation and to support the definition of the common understanding of “sustainable, acceptable projects”.
- The role of “neutral intermediaries” and the question of a “guichet unique” for developers or public authorities.

Taking into account the importance of wind energy development not only in industrial, but also in developing countries, the participation of further IEA Wind countries is encouraged for the new period.

IEA Wind Task 28 will support participating countries by

- **Providing up to date information on social acceptance of wind energy in each of the participating countries including the reporting of social acceptance trends in individual countries where possible** (e.g., reports to IEA Wind ExCo, annual reports)
- **Identifying and documenting successful policy strategies anticipated to be applicable across contexts** (e.g., Good Practice Recommendations and other publications)
- **Enabling sharing of practical information, learning from each other, complementing each other's approaches, exchange of successful strategies** (e.g., Good Practice Recommendations and other publications)
- **Discussion of the complex issues around social acceptance and gaining additional insights from the broad trans-national and interdisciplinary experience of Task 28** (e.g., working group meetings, national expert meetings, Topical Expert Meeting)
- **Working together on open issues and research gaps each country cannot achieve on its own as well as discovering opportunities for joint research** (e.g., working group meetings, national expert meetings, TEM)
- **Enlarging the network and knowledge on good practice of institutions, organizations, experts and practitioners** (e.g., working group meetings, national expert meetings, TEM)
- **Providing reports, publications and presentations in the language of planners, developers, authorities and other stakeholders outside the research community who need to be sensitized on the issue to develop good projects** (e.g., Good Practice Recommendations, articles in industry journals and branch magazines).

2 Introduction

IEA Wind Task 28 was founded in 2008 as wind energy development slowed and in some cases halted in several IEA Wind countries by strong opposition and media debates. Today, the industry has grown and the capacities in all countries have increased. However, when examining the challenges that continue to be encountered around the world, many countries will need to invest in social acceptance measures to be able to put into operation the capacity needed to satisfy the array of global and national energy policies that depend heavily on wind power.

IEA Wind Task 28 can support these policies by exchanging successful examples, by connecting researchers, administrators, politicians, associations and practitioners from various countries and by disseminating lessons learned in presentations, publications and web contributions.

Some of the dissemination activities of the last three years include:

- Web site including a web data base of social acceptance projects and publications (www.socialacceptance.ch)
- Participation at the annual EWEA conference
- Presentations of working group members at national and international expert gatherings
- Articles e.g. in national branch magazines and peer reviewed journals, interviews
- National expert meetings (organized in connection with working group meetings; US 2009, Dublin 2010, the Netherlands and Norway 2011, Switzerland 2012).

See also the final report of IEA Wind Task 28, to be expected for the ExCo meeting in May 2012.

3 Objectives and Expected Results

Many of the primary objectives from the first period will continue into the proposed second period. In some cases the objectives remain in their current form while in others past work and current needs have resulted in some modification of the previous objectives. Table 1 lists critical objectives from the first period of the task and the form they are expected to take in the second period

Table 1: Overview on objectives of the current and the proposed second period of IEA Wind Task 28

Objectives period I	**Current status**	**Proposal objectives period II**
Establishment of an international forum for exchange	Working group meeting with connected national expert meetings	Continue this exchange, reinforce working group meetings with additional online meetings
State-of-the-art report on the knowledge and results	Published beginning of 2011	Regular updates by way of the online web database, eventually as newer, but shorter report
Online library of reports/articles	More or less regular updates	Invest in regular updates and expansion of the database
Establish "Good Practices"	To be published in cooperation with Task 11	Continuation of discussion, regional dissemination, eventually translations
Tools for policy makers and planners to reduce project risks, accelerate time of realization of projects and the realization of the full potential of wind energy in the participating countries	In terms of “good practices recommendations” and dissemination of successful examples	Focus not on development of tools, but engage in active dialogue, exchange and consultation with industry, officials and practitioners, eventually short publications for practitioners and inputs for training courses
Establish strategies and communication activities to improve or to maintain the image of wind power.	In terms of dissemination activities	Concentrate on dissemination of good examples and successful strategies
		Exchange with other international projects in the area of social acceptance of renewable energies to find common “lesseons learned” and to get new input for Task 28

In an effort to continue to push forward the research and knowledge in this space, period II of the task will emphasize those objectives listed above while also prioritizing efforts to better understand trends in social acceptance over time and the quantitative impact of social acceptance on the wind industry. Period II activities will also emphasize documentation of successful policy measures and case studies that can be used to inform others of good practices and lessons learned.

In continuing to pursue objectives from period I of the task and expanding the desired emphasis of the working group, the main areas of the future work of Task 28 proposed for the next period are summarized as:

- Measurement and monitoring of social acceptance respectively quantification / valuation of the phenomenon of social acceptance and the impact of where it has not been sought; assessment of the magnitude of the issue and tracking of developments respectively development of methods, possible indicators or figures to illustrate trends. One example could be to find one or two social acceptance "indicators" that could be reported on IEA Wind level.
- Documentation of existing policies and standards that have been demonstrated to increase social acceptance, including evaluation of checklists and guidelines as well as their use, taking into account the whole life-cycle of wind turbines; dissemination of successful supporting structures (e.g., community benefits and ownership models; the question of "justice" in the sense of costs versus benefits; involvement and processes).
- Discussion of current and new issues influencing social acceptance that are being debated in the participating countries, stressing of research gaps and discovering of opportunities for joint research. Foreseeable topics are (far) off-shore with aspects such as tourism, security), repowering, impacts on ecosystems and species, electricity grid expansion due to wind energy production respectively supporting infrastructure, noise etc. Some of the topics should be discussed more in-depth, perhaps by inviting technical experts to the meetings.
- Deduction, documentation, and dissemination of the lessons learned, good practices, successful strategies etc. with the aim of improving projects and their implementation and to support the definition of the common understanding of "sustainable, acceptable projects". This also includes the exchange with experts from acceptance of other renewable energy technologies. (Publication of results in industry bulletins and peer reviewed journals, integration in training courses (e.g. environmental engineers, courses on renewable energy technologies), and recommendations for local, regional and national administrations).
- The role of "neutral intermediaries" should be approached in more depth, related also to the management of controversial projects, based on the good examples existing for example in Denmark and the Netherlands, resulting eventually in a "role description". The issue is also connected to the question of a "guichet unique" for developers or public authorities.

The contact and exchange with further projects in the area of social acceptance of renewable energies will also be sought, including GP Wind (Good Practice Wind), TP Wind (European Technology Platform for Wind Energy) the CA-RES (Concerted Action Renewable Energy Sources Directive), IEA Bioenergy Task 29 (Socio-Economic Drivers in Implementing Bioenergy Projects).

4 Approach and Methodologies

The primary work of Task 28 has been and will continue to be the exchange in the working group. Regular meetings enable an ongoing exchange on the current debates in the specific countries and discussion of good practices and successful examples from practice. In person meetings will be complimented by regular web meetings and work in groups between the meetings.

The international and interdisciplinary composition of the group (three continents, social scientists, engineers, environmental scientists; practitioners, officials, researchers etc.) has enabled a comprehensive view on the issue of acceptance (**¡Error! No se encuentra el origen de la referencia.**). Care will be given to keep this broad basis of experience in the next period.
The exchange so far was based on the inputs from country reports at the beginning of the meeting and destillation of important issues out of the country presentations. In the second phase, country`s inputs and inputs from working group members should be condenses, e.g., by the introduction of "round tables" where each country and each working group member would have some minutes to present the most important news from their projects.

The working group meetings should focus each time on one or two specific issues to enable more in-depth discussions. Additional experts for these topics should be invited. The issues are to be decided on a few months before the meeting by consultation of the working group members.

The working group would propose to undertake more consultation for its future reports and publications. This could include peer review by other social acceptance experts or consultation processes within the practitioners.

5 Time Schedule with Key Dates

Another three-year period is proposed by the working group. This period will begin in the spring of 2012 when the final report of Task 28 2008-2011 is to be presented. This would be valid under the precondition that the IEA Wind Implementing Agreement is extended as well (today`s Implement Agreement has been extended to February 2014).

A Topical Expert Meeting (TEM) is planned after consultation with Task 11 as a "success control" or "performance review" of the first phase, and a "kick-off" for the second phase. The TEM is scheduled for June in Switzerland, financed by the Swiss Federal Office of Energy. The TEM will be connected to a meeting of Swiss experts and practitioners and will also offer the opportunity to invite researchers and experts from non-IEA Wind-countries.

Historically, the working group members have met twice a year. The meetings took place at one of the participating institutions and one meeting was organized by the Operating Agent around EWEA 2010 in Warsaw. Between the meetings, web meetings helped to prepare the upcoming meetings and to keep people updated. The working group members propose to extend the period between to in person meetings, but to invest more in web meetings. Therefore, there might be only about 4 meetings instead of 6 in the three-year period, but at least 6 web meetings. This would enable working group members to save time and travel expenses; however, the regular web meetings would still enable the Operating Agent to keep contact with all working group members. In compliment to the working group meetings, the members will be invited to organize national expert gatherings where individual working group members from other countries could be invited as experts.

First ideas for the next meeting locations and dates include:

- Meeting in June in Switzerland in connection with a Topical Expert Meeting
- Meeting in Japan (organization already offeredy by Japan and Yasushi Maruyama).

6 Reports, Deliverables, Dissemination of Results

The working group intends to focus their meetings on specific issues rather than presenting country status every few months. We anticipate that these results will be captured in

- Eventually a (short) update of the State-of-the-Art Report including the new participating countries and highlighting the comprehensive view of the international and interdisciplinary approach.
- Good Practice Recommendations respectively Guidelines, including the needs of the new participating countries, focused on specific case studies and specific issues.

The working group intends to invite national experts and practitioners to review the reports and results before presentation to ExCo.
Dissemination in general should be focused on national and regional contexts as well as examples, while also taking into account good practices and strategies from around the world. Dissemination should be inserted into existing networks and publications, tailored to the specific needs of the readers of the respective publications. Already existing contacts should be used to spread our message.
Publications should be shorter than the reports from the first phase and focus on more specific issues to get the practitioners that need to know about certain aspects to read the publications.

The working group intends to use the following ways of dissemination:

- National expert meetings: Working group meetings shall be connected with a one-day national expert meeting in the respective participating country, eventually also including the national wind energy association. Further national meetings are recommended to each participating country.
- Exchange with other acceptance projects (tp wind, Task 29 biomass Annex, etc.)
- Web site and continuation resp. expansion of web database
- A kind of “newsletter” to experts in the field of social acceptance of renewable energies
- Publication in industry journals, renewable energy magazines, brochures of wind energy associations, peer review journals etc.
- Presentations and training courses by working group members or the Operating Agent, including participation at EWEA sessions
- Consultation of practitioners and associations with regards to the publications
- Integration of social acceptance issues into training courses on the level of university, universities of applied sciences and vocational training
- Tracking of debates in social media, reaction within our work and deliverance of knowhow
- Production of case studies demonstrating successful policies, standards, and other efforts that have help to building or maintain social acceptance of wind power.

The form of national gatherings should enable a more interactive exchange and the contribution of practitioners and researchers which could be mirrored on the website and participation in some social media.

International meetings should not be organized by Task 28 itself, but Task 28 should place IEA Wind Task 28 working group members as speakers for conferences and meetings, e.g. EWEA annual conferences.

Social media are NOT a channel for IEA Wind Task 28. Task 28 will concentrate on developing reliable, objective information and being a "reference" in the field of social acceptance of wind energy.

7 Methods of Review and Evaluation of the Work Progress

- The Operating Agent will continue the half-yearly reports to the ExCo and the input for the IEA Wind Annual Report.
- Reports and publications shall be reviewed by practitioners and external experts.
- The gatherings of national experts will deliver inputs for the work of Task 28 and can also offer the opportunity to review the results of Task 28.

8 Obligations and Responsibilities

The institutions of Operating Agent and working group shall be retained. As the budget of the Operating Agent has been quite modest, working group members shall be involved even more in the writing of reports, presentations or articles and the organization of the national expert meetings. Active leadership by the working group members on publications and dissemination activities will be even more critical if additional countries are found to participate in the second phase of Task 28.

Tasks of the Operating Agent

- Responsibility of Work Program and execution
- Reporting to IEA Wind ExCo (ExCo meetings, annual report, final report)
- Organization of Working Group meetings ("real life" and web meetings), support for national expert meetings, preparation of content and meeting minutes
- Coordination of results, publications, presentations, representation activities and preparation of templates
- Administration, finances and coordination of participation.

Robert Horbaty with his team from ENCO AG (Stefanie Huber and Reto Rigassi) would offer to continue their work as Operating Agent and to put their experience to the success of the second period of IEA Wind Task 28. Robert Horbaty has an experience of over 20 years in research and implementation of wind energy. Stefanie Huber has already been working closely with Robert Horbaty for the last three years and has been responsible for the operational issues and many of the publications. Reto Rigassi – working in the background for IEA Wind Task 28 so far – has expertise as manager of the Swiss wind energy branch association Suisse Eole.

Tasks of Working Group members

- Organization of his/her own costs for the work and travel expenses
- Organization of working group meeting and national expert meeting, finding of sponsors / funding
- Coordination with ExCo members of the respective country
- Collection and presentation of national developments on wind energy and social acceptance issues (renewable energy technologies, transmission infrastructure) as well as current research and implementation projects.
- Participation in the editing and review of the reports that result from Task 28 work.

Role of national experts

Since 2009, the meetings of the working group were accompanied by gatherings of national experts from the country the meeting was held in. These meetings enable researchers, practitioners and institutions within the participating country to discuss with each other and with international experts. These national expert meetings often represented the first meeting of experts on social acceptance of wind energy in the respective country. These meetings should be continued and emphasized more strongly in the second phase of IEA Wind Task 28.

In the frame of the Topical Expert Meeting planned for June 2012, an extended list of national experts from participating and further countries was elaborated. These experts shall be contacted during the proposed extension period for exchange in national expert groups with institutions, researchers, practitioners and other stakeholder groups and shall also be invited to give their input and feedback on the reports to be issued by IEA Wind Task 28.

9 Participating countries

Working group members from all ten participating countries of the first phase expressed their wish for continuation of the task. Informal consultations have taken place and some institutions have already expressed informal support; however, official country approval for the task extension has not yet been obtained. Members from Canada and Finland have already communicated that continuation of their participation in Task 28 might meet some difficulties; from all other countries, positive signals have been received.

The following institutions participated in the first period of IEA Wind Task 28 (Table 2):

Table 2: Countries and institutions participating in IEA Wind Task 28 2008-2011

	Country	**Institution(s)**
1	Canada	Natural Resources Canada, CANMET Energy Technology Centre; University of Québec at Montréal
2	Denmark	Danish Energy Authority; Ministry of Climate and Energy
3	Finland	Finnish Funding Agency for Technology and Innovation, Energy and Environment Industries (TEKES); wpd Finland oy
4	Germany	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety; Martin Luther University; Otto von-Guericke University
5	Ireland	Sustainable Energy Ireland
6	Japan	National Institute of Advanced Industrial Science and Technology; Nagoya University
7	Norway	Norwegian Water Resources and Energy Directorate; Enova SF; Norwegian University of Science and Technology, Centre for Energy and Society
8	Switzerland	Federal Department of the Environment, Transport, Energy and Communications, Swiss Federal Office of Energy; ENCO Energie Consulting AG, Wind department
9	The Netherlands	Agentschap NL, NL Energy and Climate
10	United States	U.S. Department of Energy, National Renewable Energy Laboratory Wind Technology Center

The working group would like to invite more IEA Wind countries to join Task 28 to broaden the experience pool and dissemination possibilities. Contact with experts from several IEA Wind countries has been sought that could be interested in participating in the next period: Australia, Italy, Spain, Sweden and UK.

10 Next steps

- Discussion in possible participating countries over summer / autumn 2012
- Presentation of detailed extension proposal at the ExCo in autumn 2012
- First working group meeting of the second phase in winter 2012 or spring 2013

ANNEX II:

Kick-Off-MEETING of the second phase of Task 28:

“Social Acceptance of Wind Energy Projects”

June 16th, 2012

Meeting Minutes

The International Energy Agency
Implementing Agreement for Co-operation in the Research, Development, and Deployment of Wind Energy Systems

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Task 28 "Social Acceptance of Wind Energy Projects"

Kick-Off-MEETING of the second phase,
June 16th, 2012
in connection with the
IEA Wind Topical Expert Meeting on Social Acceptance of Wind Energy Projects, June 14th and 15th, 2012

Biel

Location: Hotel Elite, Biel, Switzerland

Meeting Minutes

Attendees:

Avia	Felix	Spain
Cavicchioli	Cristina	Italy
Ellis	Geraint	Ireland
Geissmann	Markus	Switzerland
Hildebrand	Jan	Germany
Hoen	Ben	US
Horbaty	Robert	Switzerland, OA
Huber	Stefanie	Switzerland, OA
Hübner	Gundula	Germany
Huismans	Gé	Netherlands
Janhunen	Sari	Finland
Jansen	Albert	Netherlands
Jegen	Maya	Canada
Kenshi	Baba	Japan
Lantz	Eric	US
Maruyama	Yasushi	Japan
Meyer	Andrea	Germany
Pouplier	Jens	Denmark

Excused:

Bakker	Marion	Netherlands
Borch	Kristian	Denmark
Finlay-Jones	Richard	Australia
Hall	Nina	Australia
Kennedy	Matthew	Ireland
Nielsen	Lene	Denmark
Söderlund	Tomas	Sweden
Solli	Jøran	Norway
Solomon Williams	Rachel	UK

Task 28 „Social Acceptance"
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Tel. +41 61 965 99 00, Fax: +41 61 965 99 01
robert.horbaty@enco-ag.ch, **www.socialacceptance.ch**

ENCO Energie-Consulting AG

Photo

From left to right: Kenshi Baba, Jan Hildebrand, Sari Janhunen, Yasushi Maruyama,Andrea Meyer, Arne Rahbek, Gé Huisman, Albert Jansen, Gundula Hübner, Ben Hoen, Robert Horbaty, Jens Pouplier, Maya Jegen, Eric Lantz, Markus Geissmann, Stefanie Huber, Kristian borch, Cristina Cavicchioli, Geraint Ellis, Felix Avia, Furuya Shota

For the Topical Expert Meeting held von June 14th and 15th, separate minutes will be published.

Opening, Attendees, Agenda

Opening, Agenda, Attendees

The Operating Agent of Task 11, Felix Avia, and of Task 28, Robert Horbaty, welcomed the participants of the first working group meeting of the second phase of IEA Wind Task 28. The meeting followed two days of Topical Expert Meeting (see separate minutes). Robert Horbaty especially welcomed participants from countries that were present for the first time, but are interested in participation (IT, SP, FI).

The agenda was slightly adapted compared to the agenda distributed before the meeting to suit the participation of the various experts present (see presentation of OA).

ACTION ITEM 001: Write message to the SFOE to thank for support of TEM 2012 -> OA

Adoption of Minutes from the 6th Task 28 Meeting (Trondheim, autumn 2011)

The attendees unanimously adopted the minutes from the last meeting. The action items were mostly accomplished, but not discussed in detail at this meeting.

0 Update, Administrative issues

Finalization Task 28 first phase

The following tasks have to be finished to definitively close the first phase of IEA Wind Task 28:

- *Final Report: approved by ExCo, including finances, published; has to be distributed by the participants to their "sponsors"*
- *Good Practice Recommendations: approval necessary by Task 11, afterwards to be published and disseminated; wish for the "Recommendations" to be called "Guidelines" from IEA Wind – Task 28 would prefer recommendations as it is rather a collection of Good Practices and not yet as firm as guidelines should be*
- *Dissemination activities: article WIREs (in press), dissemination of the articles and the book chapter written by IEA Wind Task working group members.*

The OA thanked all participants of the first phase for their work and support!

ACTION ITEM 002: Finish all activities related to IEA Wind Task 28 first phase -> OA

1 IEA Wind Task 28 2012-2015

Introduction of second phase IEA Wind Task 28

The second phase of IEA Wind Task 28 2012-2015 was approved in May 2012 at the ExCo meeting. In autumn, an even more detailed proposal will be presented in autumn.

The countries now should hand in the official participation letter (a template was sent in July to the working group participants). The working group members have to find their own funding for travelling and the work for the task .

ACTION ITEM 003:	**Write more detailed proposal for ExCo autumn 2012**	**-> OA**
ACTION ITEM 004:	**Hand in official participation letter (template sent in July)**	**-> all**

Participation 2012-2015

The current status for participation at the meeting was as follows:

- *CA, FI, UK have already announced difficulties to get approval for participation, for example financially (UK is out of IEA Wind for the moment as well)*
- *DK: necessity to convince responsibles*
- *IE, CH, GE, JP, NL have already clearly pronounced their intention to continue and are positive it should work out*
- *US has informal support for continuation*
- *NO has shown interest in continuation, no current information available*
- *Interest from "new" countries such as IT, SE, SP*
- *AU is interested, but official talks have to start yet*
- *There are contacts to AT, but they would have to be developed*

If possible working group members would like some support by asking for official participation, the OA is happy to write letters to the ExCo members. The working group members are asked to send further contacts from their countries to the OA for further discussions.

Countries where participation would be welcomed as there are also interesting contacts: Greece (contact Meyer), Mexico (possible contact: Marco Volca), Turkey (contact Huisman), India (contact Huisman), Poland (Gawlikowska), South Africa (contact Hübner). However, Turkey,India, Poland and South Africe all have to become official members of IEA Wind first.

ACTION ITEM 005:	**Send contacts in possible participation countries to OA**	**-> all**
ACTION ITEM 006:	**Take up contacts for further participating countries**	**-> OA**

Possible topics and issues for 2012-2015

A collection of topics includes:

- *Measurement and monitoring of social acceptance respectively quantification / valuation of the phenomenon of social acceptance and the impact of where it has not been sought; assessment of the magnitude of the issue and tracking of developments, discussion of methods for indicators and helpful figures to show trends and help national programs*
- *Documentation of existing policies and standards that have been demonstrated to increase social acceptance, including evaluation of checklists and guidelines as well as their use taking into account the whole life-cycle of wind turbines; dissemination of successful supporting structures, e.g. community benefits / ownership models, "justice" (costs versus benefits (economy versus social acceptance of wind power), property prices, involvement and processes)*
- *Discussion of current and new issues influencing social acceptance that are being debated in the participating countries, stressing of research gaps (far offshore, including aspects of tourism, security, wildlife), repowering, impacts on ecosystems and species, electricity grid expansion due to wind energy production, supporting infrastructure, noise, the role of social media)*
- *Deduction, documentation, and dissemination of the lessons learned, good practices, successful strategies etc., with the aim of improving projects and their implementation; eventually development of an "IEA code of conduct" or a label for developers to proof the sustainability of the projects*
- *Increased exchange with acceptance experts from other renewables and sustainable technologies and collaboration with similar international projects (e.g. Interreg)*
- *The role of "neutral intermediaries", eventually including the development of a "role description", discussion of a "guichet unique", management of controversial projects*
- *Energy planning in a broader sense and not just on a local level, including all renewable energies*
- *Discussion of "what is acceptable" (e.g. for birds") and how social acceptance is constructed socially (models)*

The topics should enable an in-depth discussion and nevertheless be relevant for the regional contexts. Task 28 discussions should distinguish between more "technical" issues where social acceptance is a lot about communication, and topics of process which means more principal questions.

Organization

The OA is – as today – responsible for coordination, administration and organization of the task, the work on the reports in collaboration with working group members, and reporting and contact with IEA Wind.

The working group members should participate at the meetings, including the presentation of relevant news from their country or discipline, they should deliver substantial inputs for reports and the web database and disseminate the knowledge elaborated in Task 28 in their countries.

The mixture of researchers, planners, developers and administration has proved very valuable and should be kept for the second period.

An overview of the "tools" used by IEA Wind Task 28 or the function of IEA Wind Task 28 today include:

- *Mailing*
- *Website*
- *Intranet*
- *Web database*
- *Web meetings*
- *Working group meetings*
- *National expert meetings*
- *Reports and articles*
- *Connection with other projects*
- *Participation at conferences / referring point for experts*

The working group meetings should be continued, more often in the beginning, then at intervals of about 9 to 12 months, eventually for three-day-sessions, with web meetings inbetween. The national expert meetings in connection with the working group meetings should also be continued, it would be useful to have national expert meetings in all participating countries.

The meetings should focus more on specific topics rather than just collecting news and developments. Additional experts for these topics could be invited. The topics might also have to be chosen in relation to the meeting location and the issues relevant in this country to get enough experts. Otherwise, the topic could be decided on by a doodle vote.

News from countries and working group members should be done in a much shorter way. An idea would be to have a "round table": 2 minutes per country and 2 minutes per working group member. The presentations should focus more on projects than on national developments.

Inbetween meetings, working group members could continue the work in smaller groups and report at the web meetings.

Possible outputs

In general, the outputs of the second phase should have a hands-on-approach, they might include some academic publications, but concentrate on inputs for practitioners.

Possible channels for IEA Wind Task 28 to disseminate their knowledge could be:

- *publication of results in industry bulletins and peer reviewed journals*
- *integration in training courses (e.g. environmental engineers, courses on renewable energy technologies)*
- *recommendations for local, regional and national administrations (further development of recommendations into guidelines).*

In general, the target audience has to be defined more precisely. The outputs of IEA Wind Task 28 should also be disseminated rather on a regional level and tailored to the regional context. Task 28 should deliver templates, national working group members could add regional examples and also contacts.

If a more broad audience ("practitioners") should be reached, small publications, e.g. 2-page-leaflets on specific issues, might be preferable as they could also be translated and adapted where necessary. Another possibility are "research notes" (2-10 pages). Review and feedback from practitioners should be obtained on the outputs.

As a new way of dissemination, a newsletter to experts could be introduced.

The homepage should be continued as the most important dissemination activity. However, the layout should be modernized, the landing ".ch" eventually has to be changed as well. The work on the web database should be continued as well.

Social media have not been used by Task 28 so far which has been confirmed by an in-depth discussion in autumn 2011, this should not be a future activity either as Task 28 should focus on producing reliable information. Task 28 should rather continue and develop the role of "reference point" – for reliable and objective information and for experts on the various topics involved in social acceptance of wind energy.

Task 28 might not aim at organizing conferences and international gatherings either, rather send experts where experts of social acceptance of wind energy are looked for. However, as a goal for the next period, a national expert meeting in each participating country could be set.

ACTION ITEM 008:	**Develop plan of activities, possible outputs etc. for the detailed proposal for autumn 2012**	**-> OA**
ACTION ITEM 009:	**Develop national and regional activities related to Task 28**	**-> all**

2 Next meeting

If possible, the next meeting as the second of this phase, should already take place in November. The participants from Denmark will be asked by the OA if they are interested in hosting the meeting.

ACTION ITEM 010:	**Organize next meeting, if possible in November 2012**	**-> OA**

3 Adjourn

The OA thanks everybody for the participation at the TEM and today's discussions. It would be great to continue working with this group and the new experts. After a general feedback, the 1st meeting in the second period of Task 28 was adjourned.

Operating Agent:

Robert Horbaty and Stefanie Huber, ENCO Energie-Consulting AG
Munzachstrasse 4, CH-4410 Liestal, Switzerland

Tel.: +41 61 965 99 00, Fax: +41 61 965 99 01

Mail: robert.horbaty@enco-ag.ch / stefanie.huber@enco-ag.ch

Liestal, August 2012

PRESENTATIONS

IEA R&D Wind
Task 28 Social Acceptance of Wind Energy Projects
Task 11 Base Technology Information Exchange

Topical Expert Meeting
June 14th to 16th
Biel, Switzerland

Welcome!

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Task 11 Base Technology Information Exchange
Enabling Experts Worldwide to Improve Wind Energy Technology

ENCO Energie-Consulting AG 1

Short presentation of Task 28

- Research task of IEA Wind 2008-2011, new phase to start 2012/13
- Background: ambitious energy policy targets, but opposition to specific wind power projects
- International forum for interdisciplinary exchange on social acceptance
- Documentation of State-of-the-Art, destillation of Good Practices
- Dissemination of results: translation of (social) science research into language of planners and engineers

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21.06.2012 ENCO Energie-Consulting AG 2

Aim of the TEM

- "success control" of the first phase: feedback to results and the final report of IEA Wind Task 28
- discussion of issues and targets for the second phase:
  - issues to be elaborated
  - State-of-the-Art in the countries and disciplines present
  - Good Practices from the various backgrounds

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21.06.2012 **ENCO** Energie-Consulting AG 3

Content of the TEM

- **Today**
  - Introduction to Task 28 / 11
  - Individual presentations and discussions
  - «Swiss expert day»
- **Friday**
  - Further individual presentations
  - Conclusions
  - Tour to the wind park «Mont Croisin»
- **Saturday**
  - «Kick-Off» second phase Task 28

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21.06.2012 **ENCO** Energie-Consulting AG 4

"Swiss expert day"

- Meeting format of Task 28:
  - Half-day meeting between Task 28 (here TEM) and experts, researchers and practitioners from the hosting country
  - Presentations from Switzerland and international experts, room for discussions
- See seperate agenda
  - Translation French – English available

21.06.2012 **ENCO** Energie-Consulting AG 5

Recognition of Participants

- **Invitation to IEA Wind ExCo**
- **Invitation to Task 28 members**
- **Invitation directly to social acceptance experts**

21.06.2012 **ENCO** Energie-Consulting AG 6

Participants - host country

- **Katja Maus, Swiss Federal Office of Energy** (ExCo member Switzerland)
- **Markus Geissman, Swiss Federal Office of Energy** (Task 28 working group member)
- **Reto Rigassi, Suisse Eole**
- **Anna Gawlikowska, ETH Zurich**
- **Oliver Herzog, Informatik Herzog GmbH**

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE

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21.06.2012 **ENCO** Energie-Consulting AG 7

Participant - Operating Agent

- **Felix Avia, Operating Agent Task 11, Centro Nacional de Energías Renovables**

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21.06.2012 **ENCO** Energie-Consulting AG 8

Participants – Task 28 countries

- **Arne Rahbek, Vattenfall Wind Power Denmark**
- **Kristian Borch, TU of Denmark**
- **Jens Pouplier, Danish Wind Turbine Secretariat**

- **Andrea Meyer, Federal Ministry for the Environment**
- **Gundula Hübner, Martin-Luther-University Halle-Wittenberg**
- **Jan Hildebrand, Saarland University**
  (all Task 28 working group members)

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21.06.2012 **ENCO** Energie-Consulting AG 9

Participants – Task 28 countries

- **Albert Jansen, Agentschap NL (**Task 28 working group member)
- **Gé Huismans, Agentschap NL**

- **Sari Janhunen, Lappeenranta University of Technology**

- **Geraint Ellis, Queen`s University Belfast** (Task 28 working group member, present from 12 pm on)
- **Jim Gannon, RPS Group**

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21.06.2012 **ENCO** Energie-Consulting AG 10

Participants – Task 28 countries

- **Yasushi Maruyama, Nagoya University** (Task 28 working group member)
- **Kenshi Baba, Central Research Institute of Electric Power Industry**
- **Furuya Shota, Institute for Sustainable Energy Policies**

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21.06.2012 **ENCO** Energie-Consulting AG 11

Participants – Task 28 countries

- **Maya Jegen, Université du Québec à Montréal** (Task 28 working group member)

- **Eric Lantz, NREL** (Task 28 working group member)
- **Ben Hoen, Lawrence Berkely National Laboratory**

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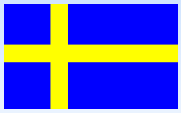
21.06.2012 **ENCO** Energie-Consulting AG 12

Participants – IEA Wind countries

- Cristina M. Cavicchioli, RSE spa

- Tomas Söderlund, PowerQuest



21.06.2012 ENCO Energie-Consulting AG 13

Excuses – Task 28 working group

- Jøran Solli, NTNU, Norway
- Matthew Kennedy, SEAI, Ireland
- Lene Nielsen, Ministry of Climate and Energy, Denmark
- Olli Laitinen, Motiva Oy, Finland
- Marion Bakker, Agentschap NL, Netherlands

21.06.2012 ENCO Energie-Consulting AG 14


Excuses – experts
Nina Hall, CSIRO, Australia
Richard Finlay-Jones, EcoEnviro Pty, Australia
Alain Nadai and Oliver Labbussière, Centre CIRED, France
Johanna Olesen, Triventus, Sweden
Rolf Wüstenhagen, University of St. Gallen, Switzerland
Patrick Devine-Wright, University of Exeter, UK
Claire Haggett, School of Planning, Architecture and Civil Engineering, UK
Rachel Solomon Williams, Office for Renewable Energy Development, UK
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15

IEA Wind Task 28

Social Acceptance of Wind Energy Projects

14-16. June 2012 Biel, Switzerland

Wind Power and Renewable Energy as Community Power:
Local Contexts and Reflective Planning

Shota FURUYA, Institute for Sustainable Energy Policies, Tokyo

isep

概要

1. Overview of Community Power in Japan
2. Lessons Learned by Pioneers' Experience
3. Emerging Community Power Initiatives
4. The Case of Odawara Renewable Energy Council
5. Concluding Remark

1. Overview of Community Power in Japan

Community Power Definition

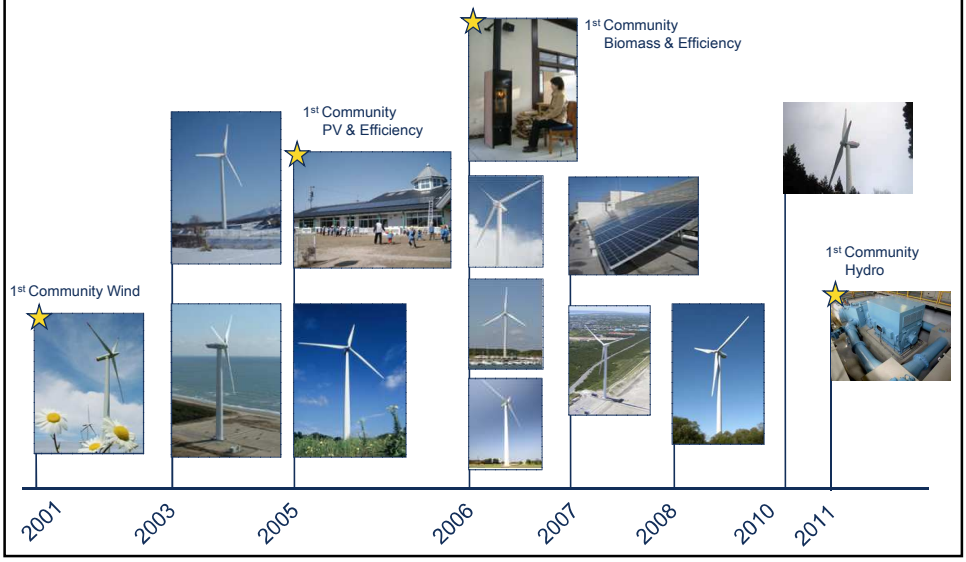
1. Local stakeholders own the majority or all of a project
2. Voting control rests with the community-based organization
3. The majority of social and economic benefits are distributed locally

* A project can be defined as Community Power if at least two of the three criteria are fulfilled

World Wind Energy Association Community Power Working Group:
WWEA highlights Community Power 23 May 2011

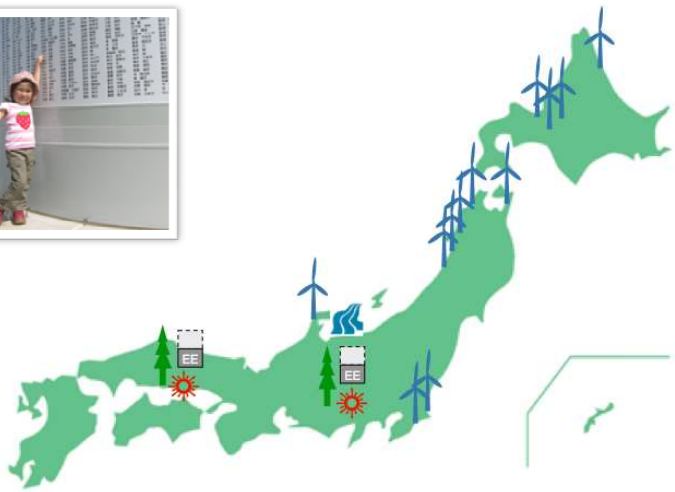
1. Overview of Community Power in Japan

Brief History of Community Power in Japan



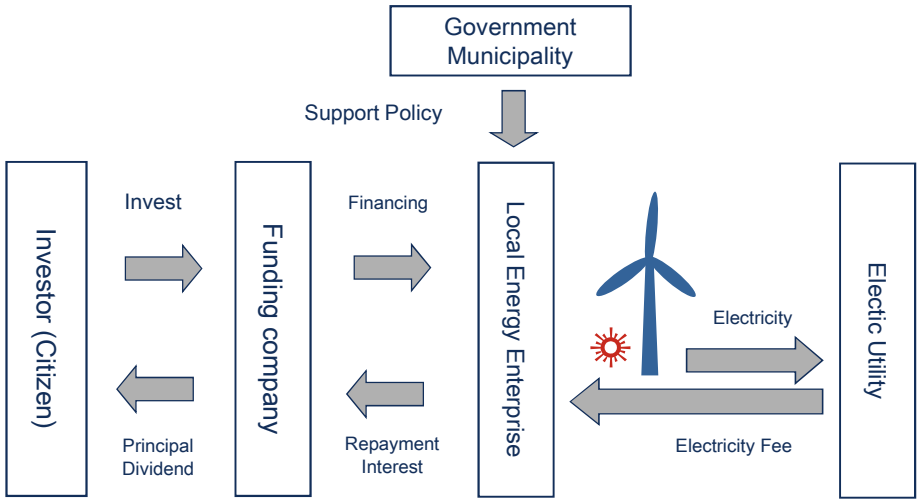
1. Overview of Community Power in Japan

- Over 6,000 investors, 3.8 billion yen
- 100,000∽500,000 yen/lot



1. Overview of Community Power in Japan

Citizen financing community power project model



2. Lessons Learned by Pioneers' Experience

From the case of pioneer community wind

- Amateur NPO staffs learned the wind power project development by cooperation with experts, especially "language of finance" (project finance, non-recourse loan or anonymous association etc.)

From the case of pioneer community PV

- Long-term roof top use permission at public facities: Importance of continuous and dialogical approach between the public sector and private sector

Each case has local contexts

- There is no single perfect solution
- Which part of knowledge can we transfer?

3. Emerging Community Power Initiatives

Support program by Ministry of Environment

Objective

- Setting up local base for renewable energy
  - Organizing local renewable energy council
  - Appointing local coordinators
  - Making concrete business plan
  - Exploring fund-raising options
  - Building social consensus
  - Realizing the business project

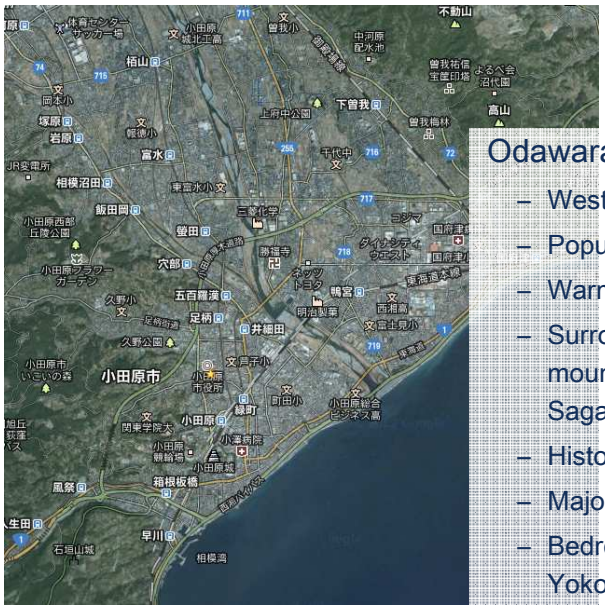
3. Emerging Community Power Initiatives

7 places of community power candidates

- Hokkaido (Ishikari City and Niseko Town)
- Odawara City
- Nagano Prefecture
- Shizuoka City
- Tokushima Prefecture
- Kochi Prefecture
- Obama Town

4. The Case of Odawara Renewable Energy Council

4. The Case of Odawara Renewable Energy Council



Odawara City

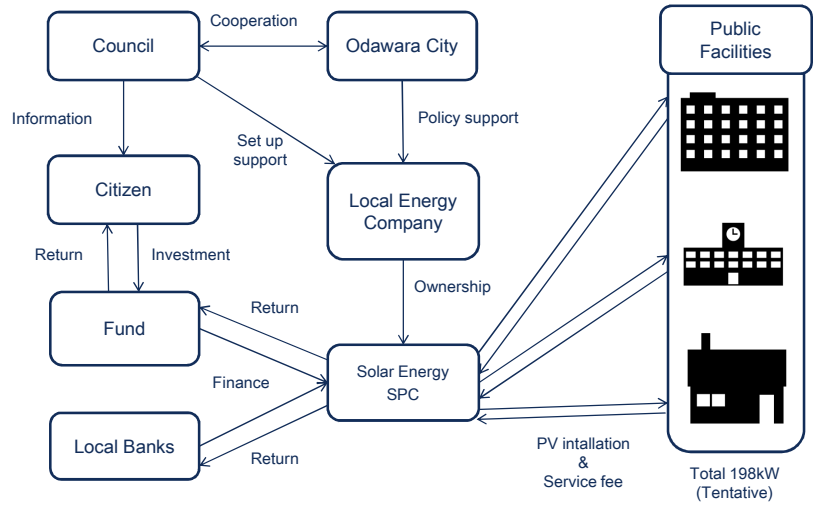
- West part of Kanagawa
- Population of 197,000
- Warm climate
- Surrounded with Hakone mountain, Sakawa river and Sagami bay
- Historical castle town
- Major commercial center
- Bedroom community for Yokohama and Tokyo

4. The Case of Odawara Renewable Energy Council

- Mayor's initiative for local renewable energy after 3.11
- Odawara City applied for the support program of Ministry of Environment, and adopted as model city in 2011 fall
- Organized "Odawara Renewable Energy Council" as a local space for planning and consensus building
  - Two coordinators from the council members
  - Distributed PV project planning team
  - Secretariat: Odawara City environmental policy unit

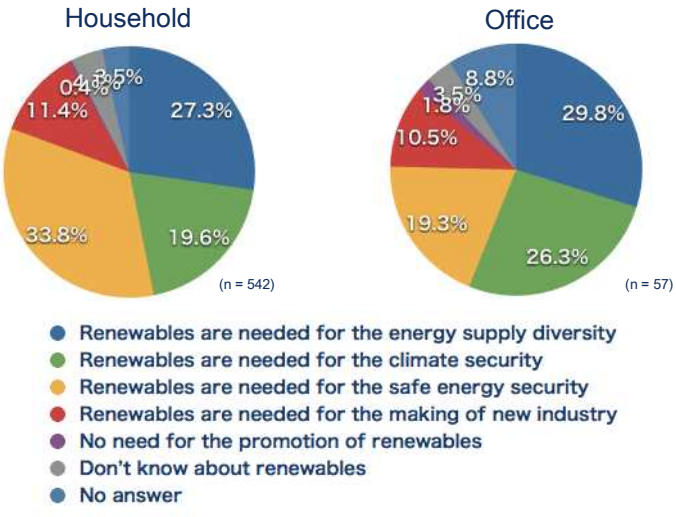
4. The Case of Odawara Renewable Energy Council

Planning of Distributed Solar PV Project



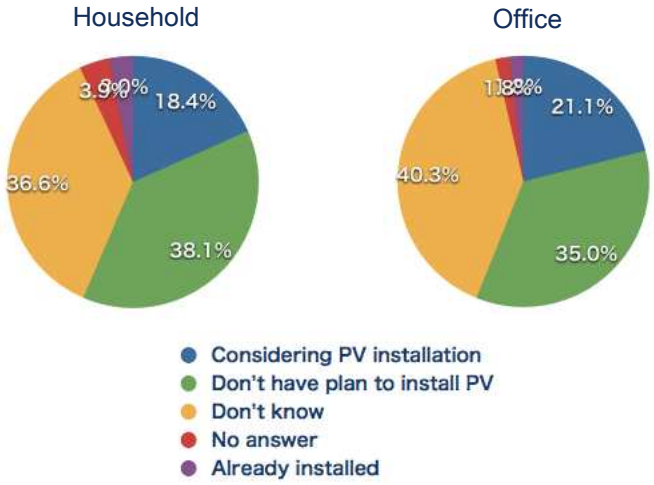
4. The Case of Odawara Renewable Energy Council

Public Communication - Survey Research



4. The Case of Odawara Renewable Energy Council

Public Communication - Survey Research



4. The Case of Odawara Renewable Energy Council

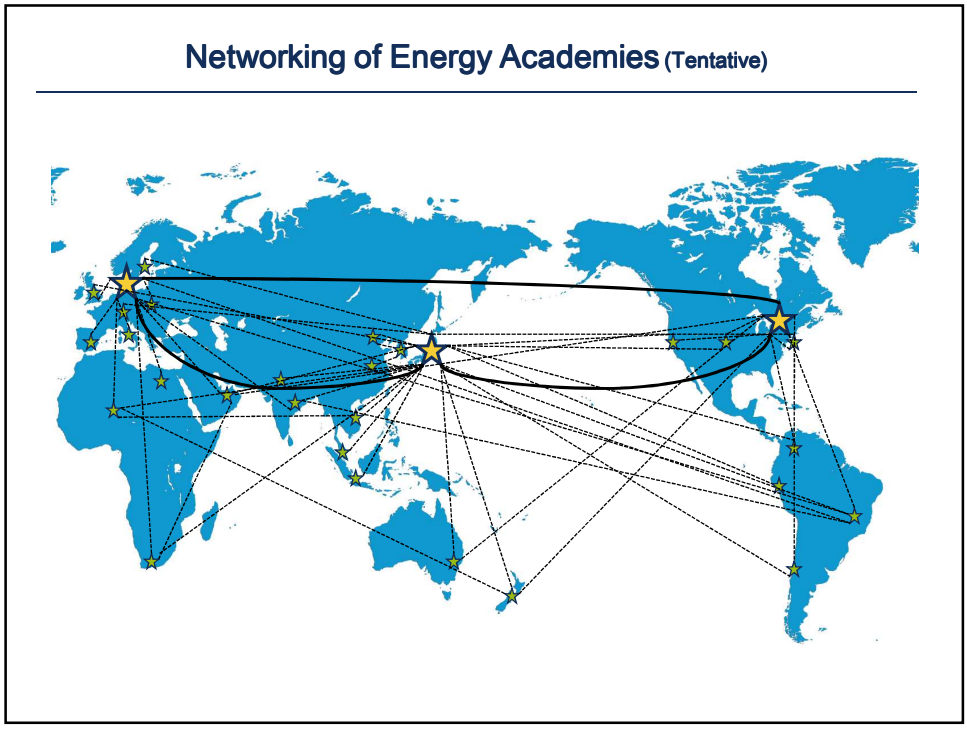
Public Communication – Group Interview

5. Concluding Remark

- After 3.11, dozens of community power initiative have emerged and 7 places started the formal planning process with the support of Ministry of Environment
- Basic ideas or concepts of the pioneer cases would be transferable to the emerging cases, such as business model or finance model, however it is important to be careful about unique local contexts
- So as to communicate better with local citizen, supporting institutions need to make careful effort to identify unique local contexts
- Global network of community power supporting institutions might play significant role for the further development of community power

Japan Community Power Conference March 8, 2012

http://goo.gl/khrZK


Networking of Energy Academies (Tentative)

Smöjen, a wind farm owned by Siltevind

Photo: Fredrik Lindahl, CEO Siltevind

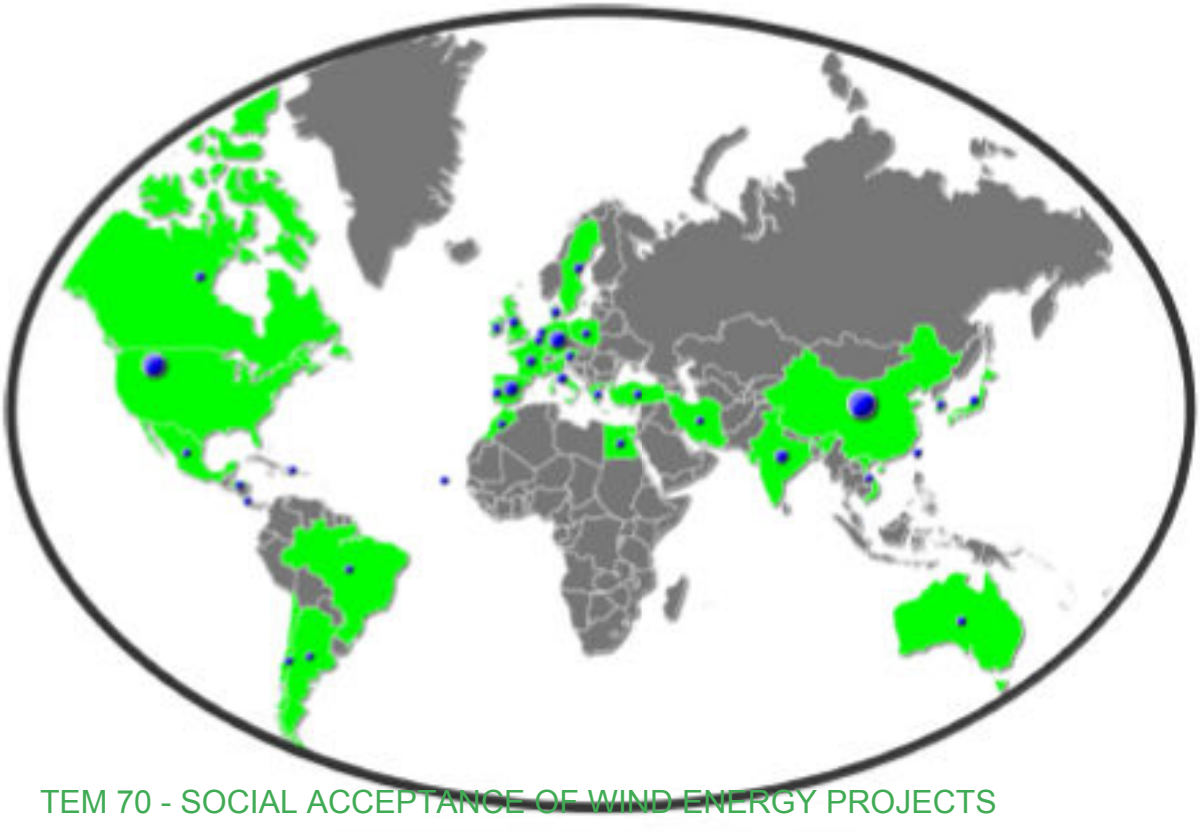
Code of Conduct for the Swedish wind power industry

vindkraft

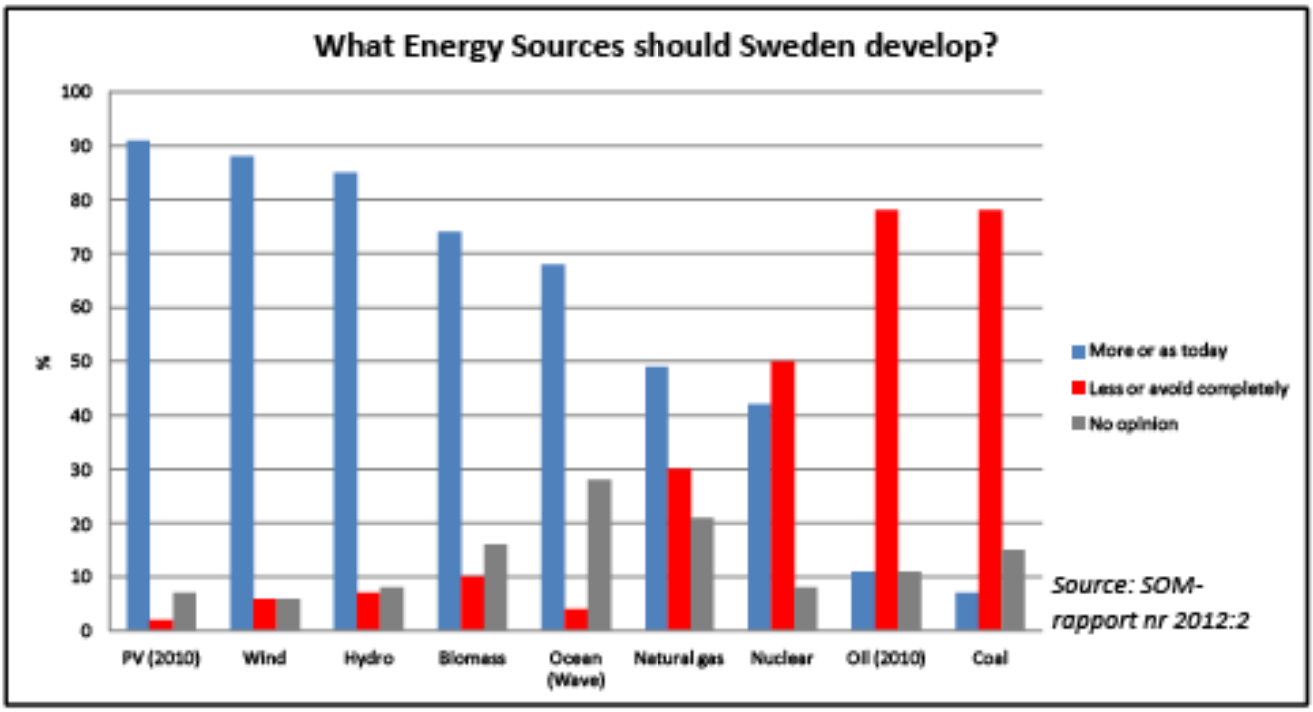
Svensk Vindenergi

Energimyndigheten

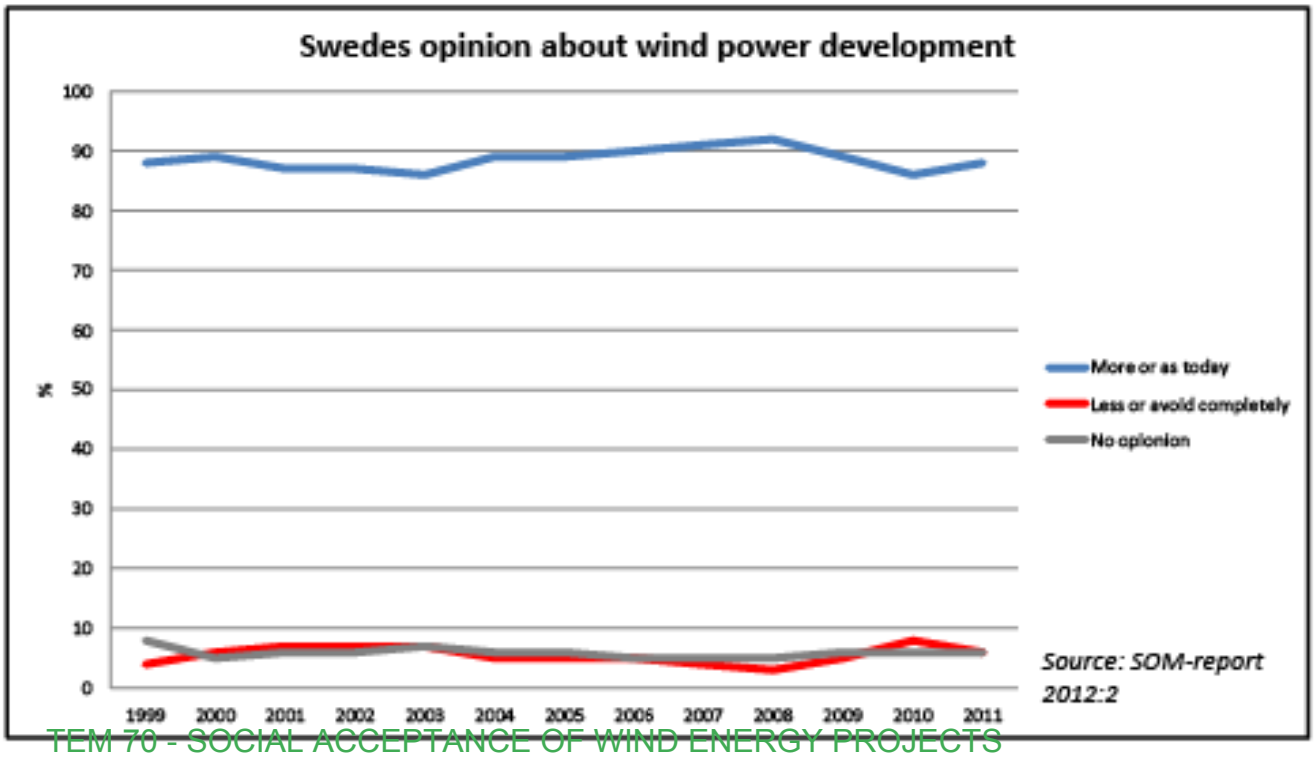
Swedish wind power still small but grow fast



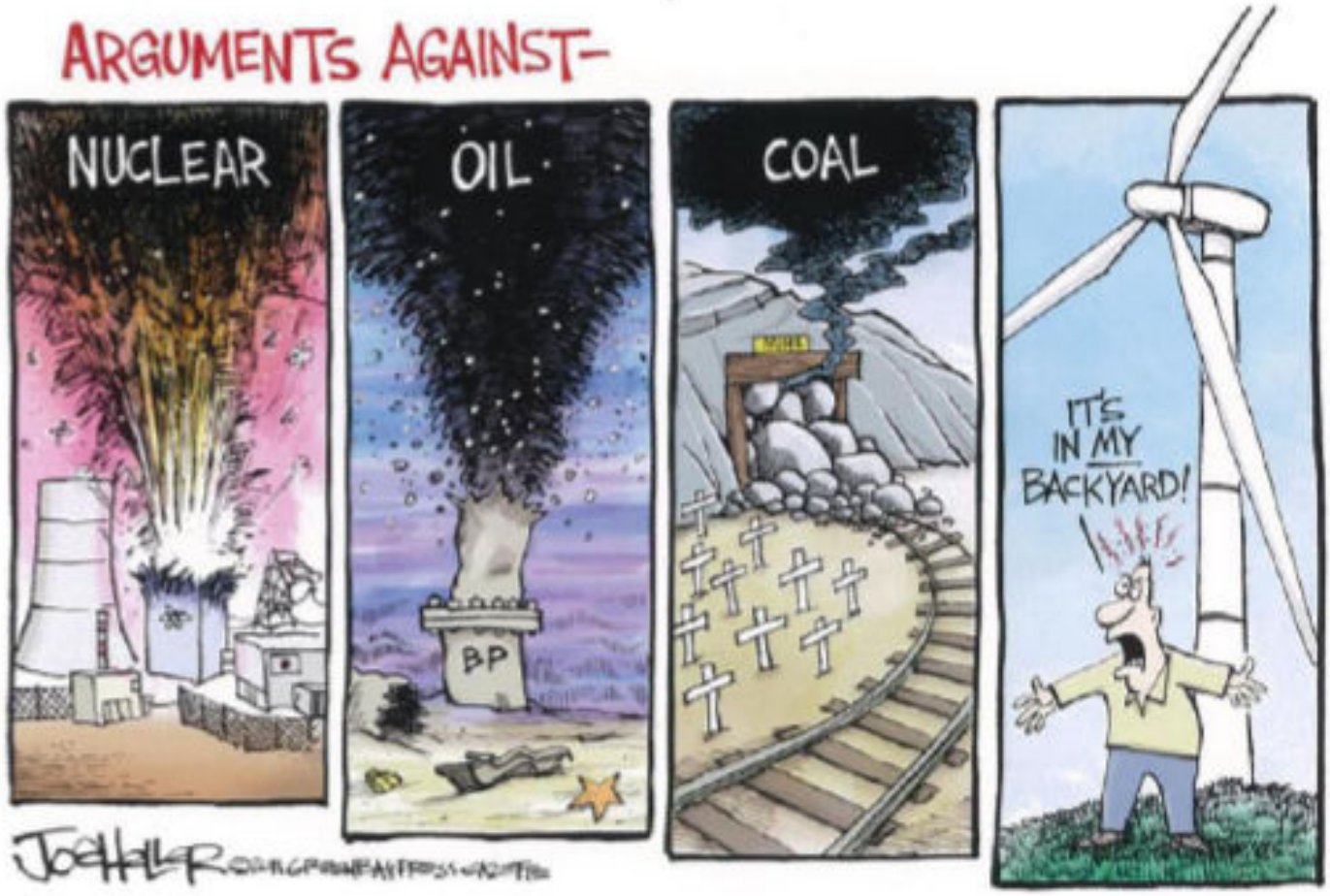
Survey by the University of Gothenburg put wind in top three of energy sources



Swedes positive about wind power for several years



Social acceptance



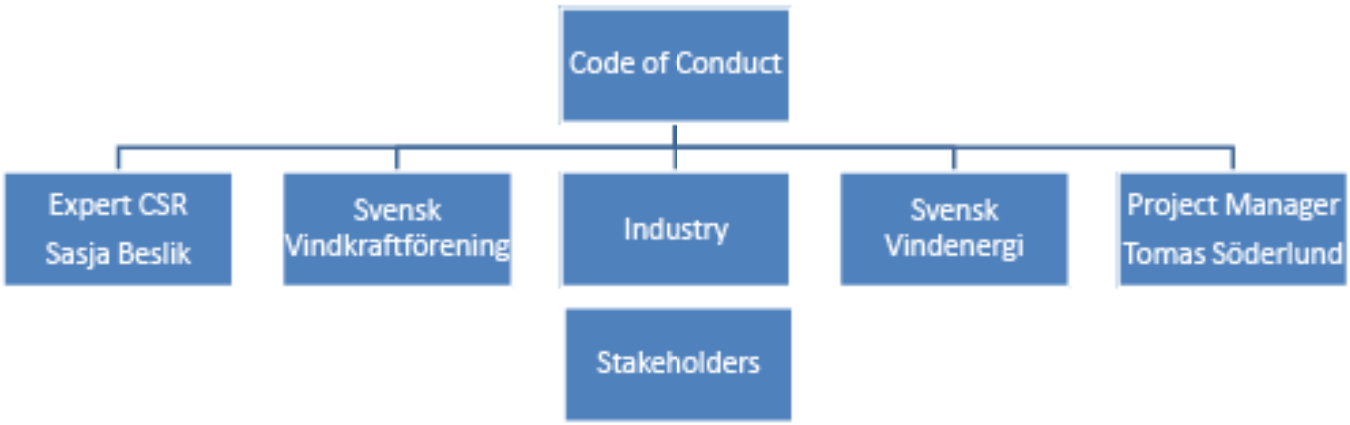
How we did it

Phase 1 (2009-10)
- In co-operation with the industry
- Good examples from developers

Phase 2 (2011)
- Development to State of the art
- Administration

Phase 3 (2012)
- Education
- Communication (Swe & International)

Organisations involved



Example of stakeholders for project development

The Code of Conduct

Six pages document in Swedish and English containing:

- General information on conduct
- Human rights
- Working conditions
- The environment
- Bribery and corruption
- Establishing a wind power facility - communication
- Communication during operation
- Links to other documents
- Scope
- Action in the event of a deviation from the Code of Conduct
- Council
- Monitoring and reporting

Establishing a wind power facility - communication

1. Refer to the Code of Conduct on websites relating to the wind power facility.
2. Tell the truth.
3. Identify stakeholders and encourage them to participate in the project.
4. Find structured information about, and analyse other stakeholders when there is competition for the site
5. Have a plan for distributing information.
6. The absolute minimum is to have discussions on the Internet.
7. Style rules which the TT language or the equivalent uses for written information.

A project developer who works effectively and does more than the law requires lays an excellent foundation for new projects.

What's next?

Contacts

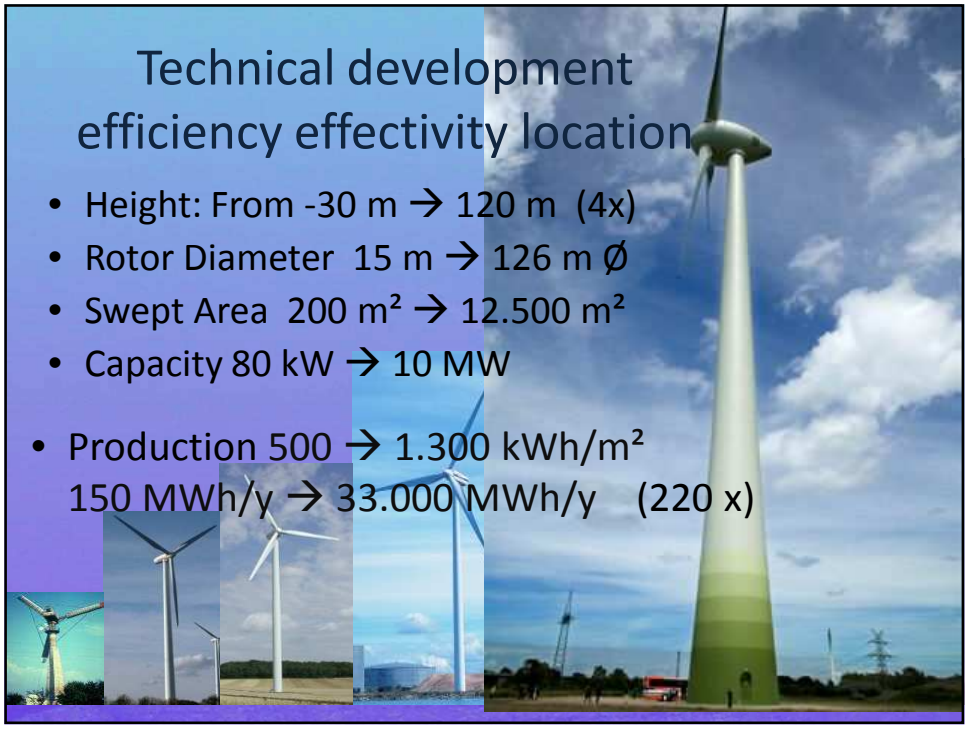
- Project manager: Tomas Söderlund
  tomas@powerquest.se
- Svensk Vindkraftförening: Mr. Gunnar Grussel
  gunnar.grusell@minmail.net
- Svensk Vindenergi: Ms. Monica Bracco
  mb@svenskvindenergi.org


300 Years
Wind & Energy
in the Netherlands


30 Years
Citizens & Windenergy
in the Netherlands
Albert Jansen
Agentschap NL
Ministerie van Economische Zaken,
Landbouw en Innovatie


Presentation
• Introduction
– History
– Technical Facts and Developments
• citizen participation involvement
• Policy context & development
• The role of communities
• Recommendations


History
• 1500-1880 Wealth of NL
• 1972 -Oil crises – do it yourself
• 1972- 1990
NL Industry & Science leading
– Delft T-Uni / ECN
– Lagerwey
• Direct drive / Two blades
– Decline 200-2010
• Technical orientation
• Ever changing policy


Technical development
efficiency effectivity location
• Height: From -30 m → 120 m (4x)
• Rotor Diameter 15 m → 126 m Ø
• Swept Area 200 m² → 12.500 m²
• Capacity 80 kW → 10 MW
• Production 500 → 1.300 kWh/m²
150 MWh/y → 33.000 MWh/y (220 x)


Where are the Dutch turbines
- Most in the Coastal area
- harbours, (industrial activity)
- along motorways & dikes (in line)
- in the polders (agrarean area)

Where are the dutch turbines

- http://www.w-i-n-d.nl/Default.aspx

Wind-Electricity Production

per juni 2007 -bron WSH /SN

Province	# -turbines	Electricity - production
South Holland	8%	18%
Flevoland	32%	34%
Fryslân	17%	10%
Netherlands	1.867-turbines	3.681.000 -MWh
(incl Northsea)	=15,7 % houshould-demand	= 1.040.000 housholds

Wind Energy Production

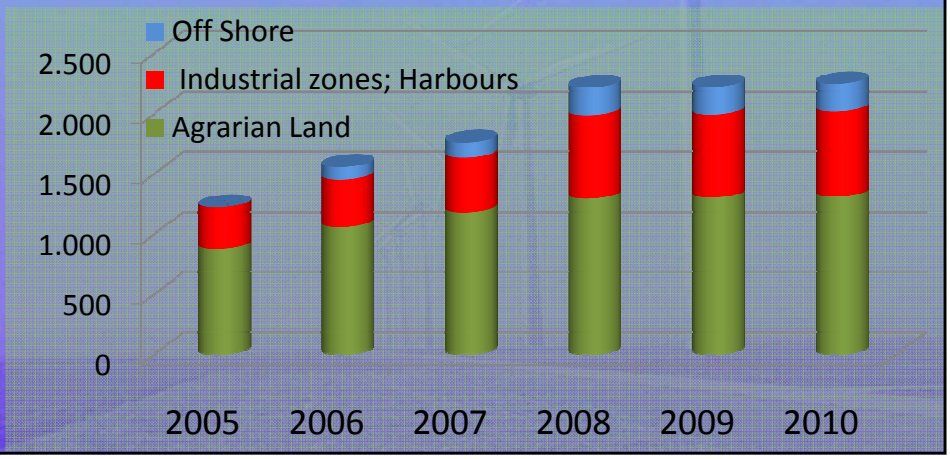
start 2011

	Production			Swept Area		#	Capacity	
	MWh	%	MWh / Turb	m²	kWh / m²	Turb	MW	KW / Turb
TOTAL	**5.237.480**	**100**	**2.651**	**5.016.696**	**1.044**	**1.976**	**2.228**	**1.127**
North Sea	723.800	14	7.540	530.615	1.364	96	228	2.375
On shore	4.513.680	86	2.416	4.486.081	1.006	1.868	2.017	1.080

- Production
  3 % total electricity demand
  22 % of household demand

On whose Land ?

- Agrarians / (+State) : *Agrarian land* 70% to 65 % (58 %)
- National State *Off shore*
- Municipalities*: Industrial zones & Harbours*



are citizens /residents involved ??

The Public

- in Favour (23%), FINE ! - segment
- Some remarks (30%), OKÉ-segment
- Indifferent (34%), WELL - segment
- Declared enemy (13%), NO -segment

Citizens/ Communities role

- Participation
  - Involvement Development Proces
  - Organisational involvement
  - Financial participation
- Who is involved ?
  - Neighbours
  - Other Residents in vicinity
  - Local entrepreneurs
  - Interestgroups
  - (Small) investors
  - Windturbine owners (rehabilitation)
- Different over time and region

Financial Participation over time

- Untill 2000
  - Cooperatives
  - Idealists
- 2000 – 2005
  - Vilage Mill (communities in Friesland)
  - (tax)project fund
  - Equity participation (ownership)
    - enforced by municipality of Dronten:
    - building permission only when neighbours agree

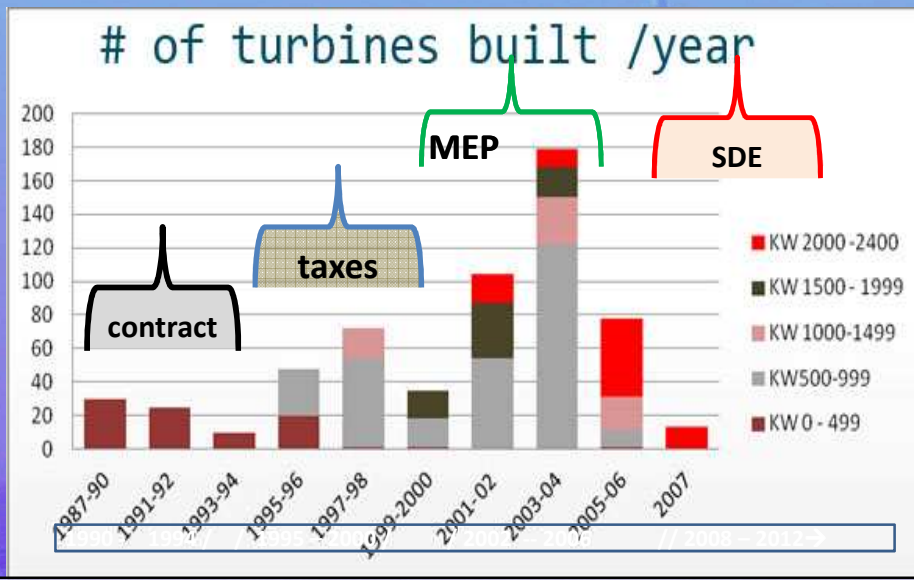
Financial Participation over time

- 2005 – 2012
  - Regional ownership
  - Organisational participation
  - Regional funds feeded by revenues

Policy context

- Municipalities : Building permit / floor use plan
- Provinces & National Government
  - Spatial Structure plan
- National Policy instruments
  - Administrative agreements Provinces & National government
  - Financial support schemes
  - new planning law (2010)
    projects > 100 MW = national planning responsability
    projects >5 & < 100 = provincial responsability

Financial support schemes



Citizens participation

- Involvement Development Proces & Organisational involvement
  - until 2005 →
    - Communication
    - Informing, excursions
    - Hearings in planning prcedure
- 2005 → 2012
  - zuidlob community participation
  - Wieringermeer : cooperation
  - Friesland : organisation
  - Flevoland : organisation co-development

POLICY CONTEXT

national level policy instrument

- Implementation of renewables program
  - operated by Agentschap NL
  - Relative independant
  - Expertise centre (knowledge, skills, support money)
- Windteams
  - Intermediate
  - initiators, municipalities, provinces
  - Aim realisation of project in sustainable way
  - Support communication & organisation

Community involvement by windteams

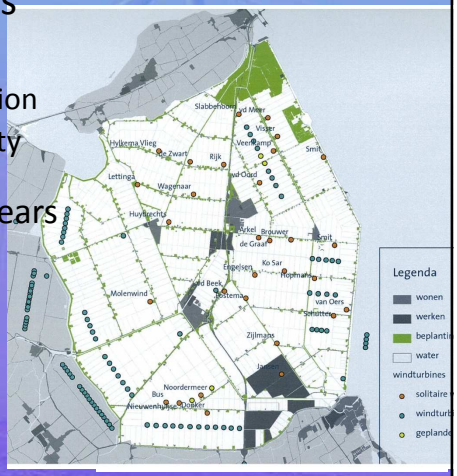
- 4 cases
  - Zuidlob
  - Friesland
  - Wieringermeer
  - Flevoland

Zuidlob Citizens participation

- Involvement of the region
  - PLANNING
  - DEVELOPMENT
  - INVESTMENT
- Zuidlob (2006)
  - All residents
  - One organisation
  - One developmen
  - Revenues for envi
  - 2012 Under const

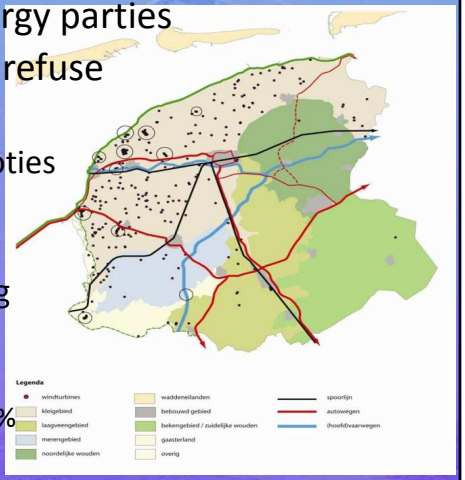
Wieringermeer

- Organisation of Initiators
  - Co-development of plan
    - Repowering & rehabilitation
    - Involvement of community
- Community involvement 3 years
  - 2 x windweekend / week
  - Design contest students
  - Surveys
  - Gaming
  - Partnership Factory



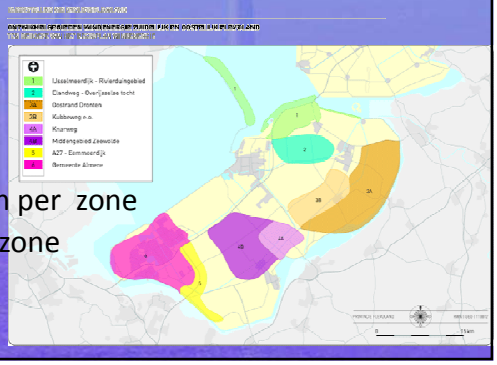
Friesland

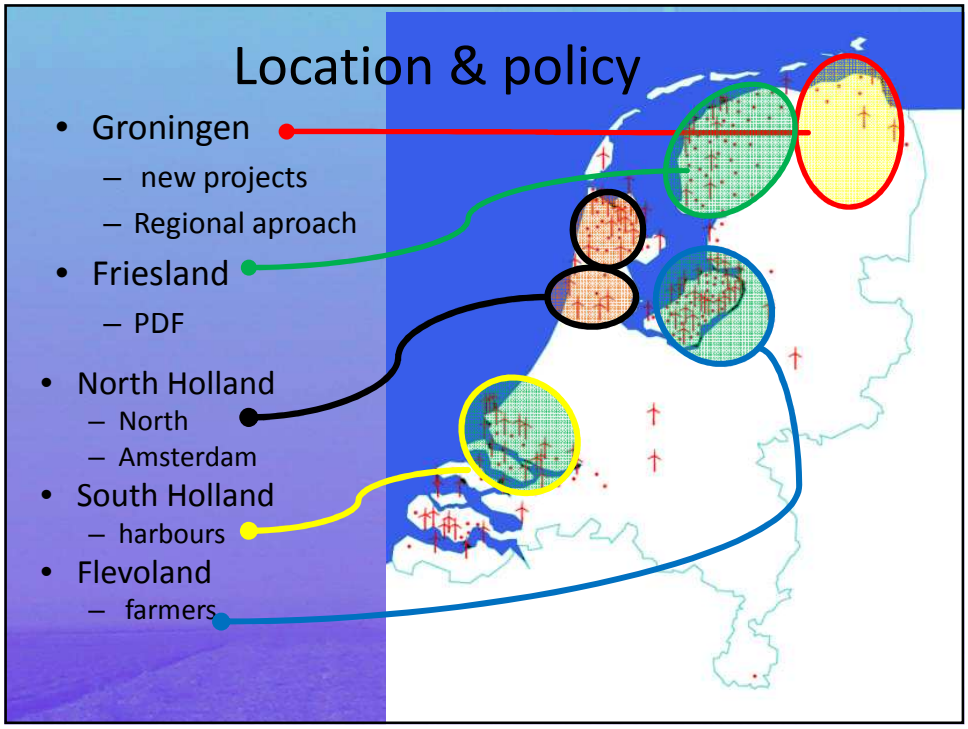
- Empowerment of windenergy parties
- make an offer they cannot refuse
  - Umbrella organisation
  - Fit to negotiate with authoroties
  - Brings participation & windenergy on the agenda
  - One ambition for repowering
  - Plan:
    - Decrease # towers 300→200
    - Increase power outcome 400 %
    - Expand # village mills



Flevoland

- Cooperative planning
  - National- province- municipalities
  - Umbrella organisation
    - Turbine owners
    - Landowners
    - Citizen
  - Regioanal approach
    - Province→ 6 zones
    - One rehabilitation plan per zone
    - One organisation per zone





summarizing

- Community developments does not come out of the blue
- Empowerment of local groups
- Continues coaching
  - Relative indepentdent (“windenergy”
  - Expertise & skills
  - Aim to organise the work floor
- Little money
  - Financed national state
  - Flevoland provincie & private -
  - Private money (As planning outome less risky)

Windteam communication strategy

- Windweekends
- Involving the local Community

Support Local discussion

- Gaming get all the arguments on the table
  - Get all the ideas from the community

28

Windteam communication strategy

- Design workshops
- Support mirror group
- Partnership factory
  - Brings bids and demands together in partnersips
  - Organises the social environment in favour of windenergy
- toolbox on a dedicated website http://tools.windenergie.nl/

Are citizens involved?

Yes , just organize them

RPS

Social Acceptance of Wind Energy

A Project Development Perspective

Jim Gannon
RPS Group

International Energy Agency Wind Task 11
Hotel Elite, Biel
14th July

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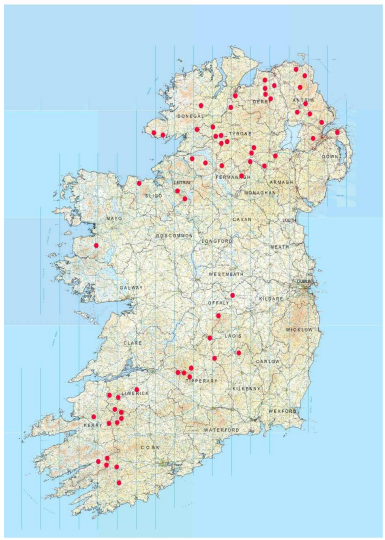
RPS

- 500MW+ Due Diligence (BGE)
- Engineering, Environment, Planning, Communication (Coillte, TCI, Vestas, E-on)
- Wind Energy Roadmap
- Local Authority Renewable Energy Strategies
- Irish Scottish Links Energy Study



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Social Acceptance

- Wustenhagen 2007: three dimensions of social acceptance – socio-political, community and market acceptance
- Wolsink 2008:
  - Socio-political acceptance:
    - Of technologies and policies
    - By the public
    - By key Stakeholders
    - By Policymakers
  - Community Acceptance:
    - Procedural Justice
    - Distributional Justice
    - Trust
  - Market Acceptance
    - Consumers, Investors, Intra-firm

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Social Acceptance

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Social Acceptance



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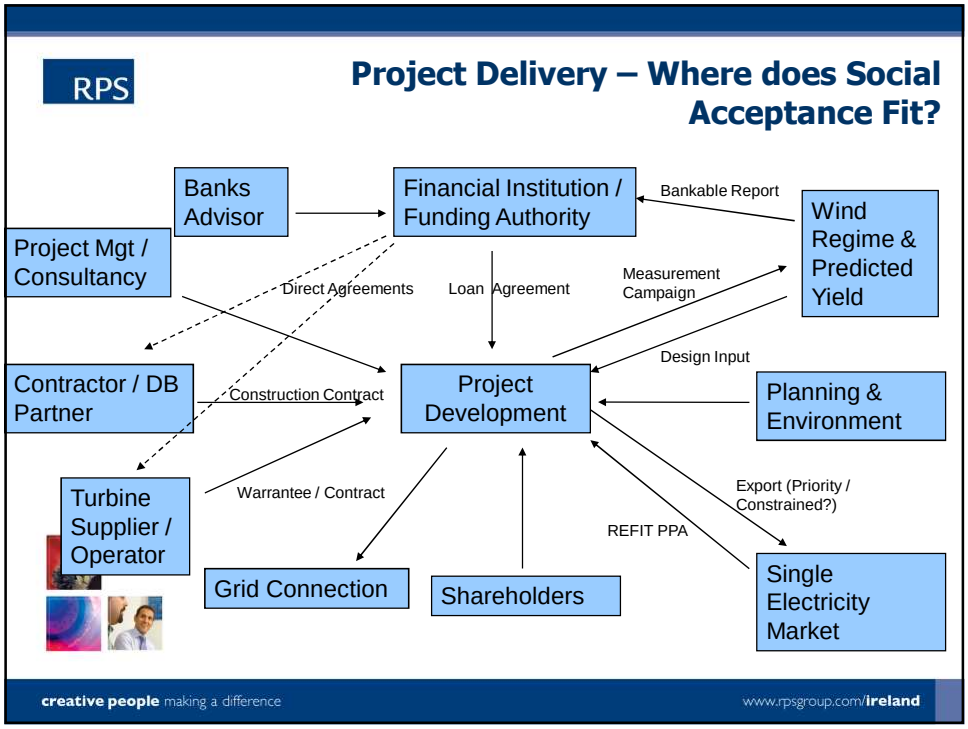
RPS
Project Delivery – Where does Social Acceptance Fit?
Banks Advisor
Financial Institution / Funding Authority
Bankable Report
Wind Regime & Predicted Yield
Project Mgt / Consultancy
Direct Agreements
Loan Agreement
Measurement Campaign
Design Input
Contractor / DB Partner
Construction Contract
Project Development
Planning & Environment
Turbine Supplier / Operator
Warrantee / Contract
Export (Priority / Constrained?)
REFIT PPA
Grid Connection
Shareholders
Single Electricity Market
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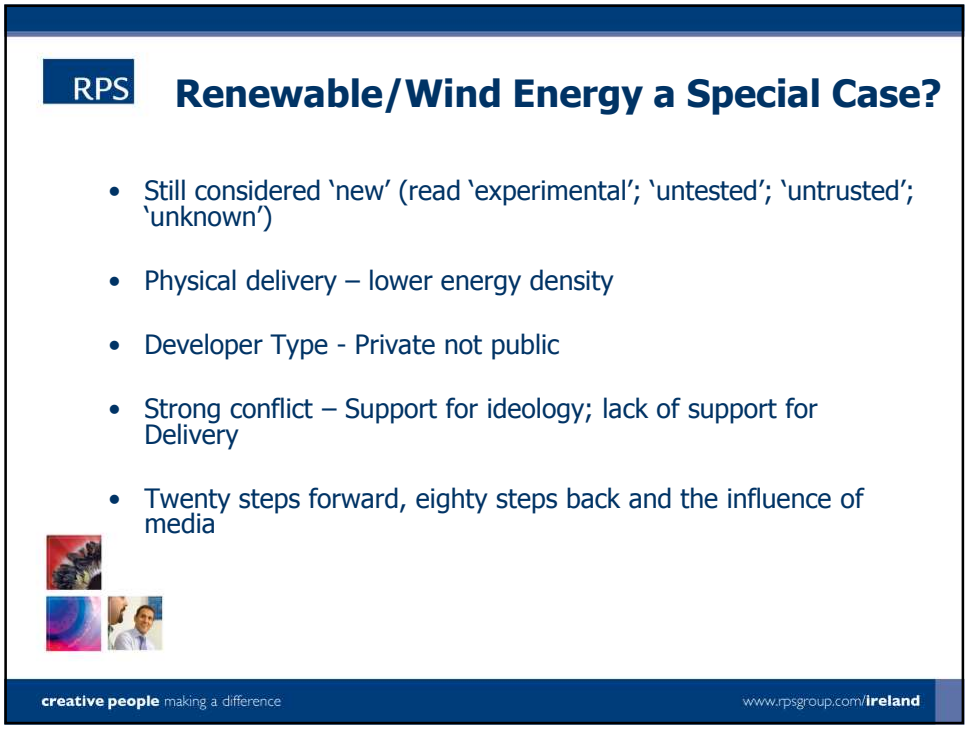
RPS
Renewable/Wind Energy a Special Case?
• Still considered 'new' (read 'experimental'; 'untested'; 'untrusted'; 'unknown')
• Physical delivery – lower energy density
• Developer Type - Private not public
• Strong conflict – Support for ideology; lack of support for Delivery
• Twenty steps forward, eighty steps back and the influence of media
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Common Conceptions

- Social Acceptance is a problem
- NIMBY is real
- Social Acceptance can't be tackled at a project level
- Saturation and the Cotton Wool Wall is best
- The Planning Process is a risk/constraint/problem/hoop to jump through
- Problems at Day 1 are Problems at Day n+1

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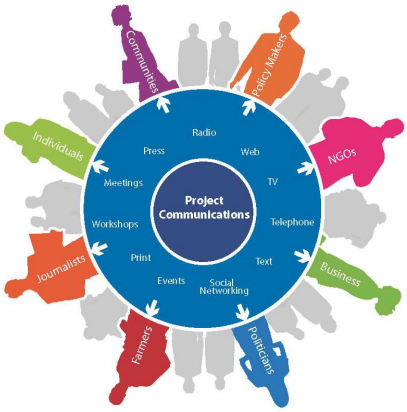
Project Perception

- Project or National – Broad Spectrum
  - Polarised Opinion – Vocal Minorities
  - National Opinion and National Media
  - Communication at Project Delivery Not Sufficient – Early Consultation Critical
  - How does it sound - 11,000MW ~ 4,000 Turbines
  - Robust, Accurate and Independent Information – WtE Example



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First Steps

- Engage Early, Honestly and Often
- Extreme Support, Extreme Objection
- Dissemination of Information can be Problematic
- Commitments Need to be Realistic and Aims Transparent

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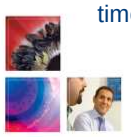
Why Consult?

- Establish relationships early on
- Deliver valuable project information
- Build trust and respect
- Concerns of stakeholders can be incorporated into the project early
- Can help deliver the project on time and within budget



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Key Principles

- Go early and keep going
- Be consistent
- Be flexible
- Be open and honest
- Follow through
- Engage, Listen and Respond transparently, do not Dictate

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Common Communications Challenges

- Technical Issues
- Entrenched opposition
- Misinformed public
- Lack of understanding benefits (or lack of benefit?)
- Negative local history
- No trust or respect

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Overcoming Communications Challenges

- Information vs. consultation? (the problem with expectation)
- Use the right methodology
- Define what you want to know
- Know your stakeholder – Stakeholder Mapping Crucial
- Understand their issues
- Good Records and Reporting

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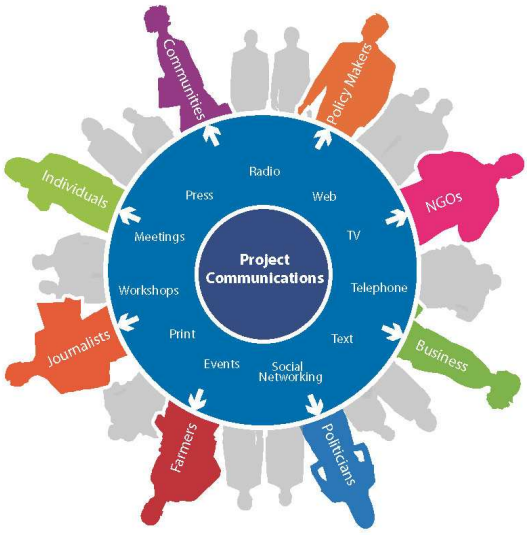
Methods of Communication

- Many methods - direct, intermediary, indirect
- Choose most appropriate method for your stakeholder group



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Conclusions

- Social Acceptance sets the context for energy infrastructure development
- Social Acceptance is (partially) created by infrastructure development
- Infrastructure is seen as passive until:
  - There is a problem through failure or urgent need
  - We need to develop more (….there is a big problem)
- Requirement to put infrastructure into context as vital to our environment, health and wealth and as an active participant in our culture, economy and day to day lives
- Social Acceptance and treatment of same in project delivery is a determining success factor


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Thank You

jim.gannon@rpsgroup.com


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énergies renouvelables

Suisse Eole Commission des entreprises

Jeudi 14 juin 2012

Suisse :
L'acceptation malgré des circonstances difficiles

Walter Schmied, Directeur développement de ennova SA

ennova
énergies renouvelables

14.06.2012

Une volonté de partenariat, un processus participatif

L'acceptation dans la population relève de trois domaines :

a. philosophique

b. psychologique

c. social

« Ensemble, pour une nouvelle génération d'énergies ! »

2

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a. Niveau philosophique:

=> Une turbine défigure-t-elle la montagne ?

3

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14.06.2012

Une turbine défigure-t-elle la montagne ?

La question revient à se demander si un bateau en haute mer défigure le plan d'eau !

4

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énergies renouvelables

14.06.2012

b. Domaine psychologique

La «résultante psychologique» relève des :

- connaissances scientifiques

- ressentiments émotionnels de l'individu

5

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14.06.2012

b. Domaine psychologique

La réussite d'une démarche «participative» dépendra :

a. de la faculté du développeur à communiquer d'égal à égal en se plaçant au niveau de connaissance du partenaire.

b. de la faculté du développeur à se placer - du point de vue des émotions - «dans la peau» du partenaire ;
- se demander pourquoi je n'aboutis pas aux mêmes conclusions que l'opposant (et non l'inverse),
- éviter les pièges des préjugés.

6

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14.06.2012

c. Domaine social

Un fait établi :
le paradoxe veut que l'opposition évolue de manière inversement proportionnelle à la distance du parc.

Références :
- étude Suisse Eole
- constat JUVENT

7

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14.06.2012

c. Domaine social

Enseignement :
il y a lieu de différencier entre opposition ;
- émanant de milieux directement concernés par un parc éolien,
- émanant de milieux non-concernés directement.

Action :
Anticiper et prévenir de sorte que les opposants directement concernés ne soient pas «pris en otage» par les opposants non-concernés directement par le projet.

8

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14.06.2012

c. Domaine social

Exemple de la distances, du bruit…

=> avec l'opposition «constructive» il est utile de «négocier» les critères.

=> l'opposition «fondamentale» refusera par principe d'entrer en «négociation».

Dans ce dernier cas de figure, il s'agit de rester constructif de sorte que les «mesures de compensations» suffisent à rassurer les autorités et les décideurs du bien-fondé et de l'utilité du projet.

9

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14.06.2012

c. Domaine social

Justice sociale du projet :

Veiller à ce que les retombées sociales positives trouvent preneurs en fonction de clés de répartitions légitimes et équitables !

10

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14.06.2012

c. Domaine social

Aménagement du paysage et du territoire :

La collectivité doit se positionner face à l'alternative suivante. Veut-on ;

a. intégrer les parcs éoliens dans les paysage existants, ou

b. «construire de nouveaux paysages» en y «industrialisant» l'implantation des turbines

11

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14.06.2012

c. Domaine social

Aménagement du paysage et du territoire :

Les aménagistes du paysage et ceux du territoire doivent se mettre d'accord sur les intérêts des uns et des autres lorsqu'ils s'avèrent contradictoires.

=> thèse de la «première chaîne»
=> thèse de la concentration ou de la décentralisation des parcs

12

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14.06.2012

c. Domaine social

Ne pas perdre de vue l'essentiel :

1. En matière d'efficacité :

Une turbine éolienne équivaut à 30'000 m^2 de PV

13

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14.06.2012

c. Domaine social

Ne pas perdre de vue l'essentiel :

2. En matière d'atteintes également.

Merci de votre attention.

14

The Danish Windturbine Secretariat: Background – task – organization





Established nov. 2008.

Assists local planning authorities – free of charge.

Placed in the Nature Agency, Danish Ministry of the Environment.

Primary focus: Planning process and environmental impact issues.

Naturstyrelsen - Vindmøllesekretariatet

Background – task – organization

Quote from the Danish Energy Agreement 2012:.

"To ensure areas for the placement of Wind Turbines, the existing Wind Turbine Secretariat is prolonged for this task in the Danish Ministry of the Environment. A sum of 13,2 mio DDK is earmarked to finance the secretariat for the period 2012-2015" (ca. 1,7 mio Euro).

Naturstyrelsen - Vindmøllesekretariatet

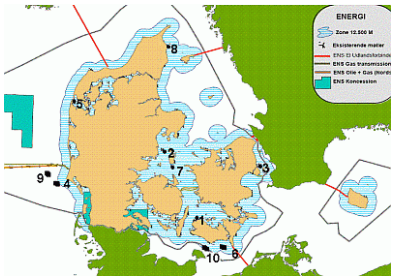
Wind turbine planning in Denmark

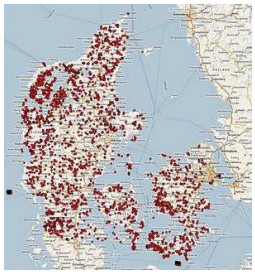
Authorities

Offshore – Ministry of Climate and Energy

Land based < 150m – 98 Municipalities

Land based > 150 m - Ministry of Environment





Naturstyrelsen - Vindmøllesekretariatet

What are the challenges

Often insufficient local expertise in the municipalities.

Too much (mis)information

Complex legislation divided into many different fields of responsibility

Many separate government authorities responsible for the formal judicial guidance applicable for Wind Energy planning

Naturstyrelsen - Vindmøllesekretariatet

Challenges, cont.

Insecurity on all levels: Citizens (neighbors), administration and local decision makers

Many experts, but few with a broad perspective or specific knowledge about Wind Turbines

Complex interaction between legislation, politics, economic interests and the public reaction

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The Danish Wind Turbine Secretariat
Services

Assists the local authorities with the planning process:

- Locating potential areas
- Providing advice on the planning process
- Providing examples from other municipalities
- Assisting dialogue with politicians
- Assisting dialogue with government authorities
- Assisting dialogue with citizens

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The ”one-stop-shop” or ”switchboard” principle

Providing an overview of the relevant information in Wind Energy Planning – the broad perspective

Putting questions forward to the relevant authorities, and writing FAQ’s which are validated

Hands on approach – participation on site at seminars, public meetings, excursions, and local council and committee meetings, etc.

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Case studies:
"Best practice" seminars and workshops

Naturstyrelsen - Vindmøllesekretariatet

Participation in local public meetings

Naturstyrelsen - Vindmøllesekretariatet

Participation in local council and committee meetings

Naturstyrelsen - Vindmøllesekretariatet

Visiting Wind Farm projects and neighbors

Feedback to legislators – reality check

Naturstyrelsen - Vindmøllesekretariatet

Impact on ”social acceptance”?

Questions are handled in a broader perspective

More efficiency in both local and government administrations

Fewer questions – better answers

Less insecurity

Better and more relevant involvement and debate

Naturstyrelsen - Vindmøllesekretariatet


Miljøministeriet
Naturstyrelsen
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vind@mim.dk
www.vind.mim.dk
Tlf.: (+45)72543823

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE
Office fédéral de l'énergie OFEN
Ufficio federale dell'energia UFE
Swiss Federal Office of Energy SFOE

Switzerland's Planning and Approval System for Wind Energy Projects

Markus Geissmann, Renewable Energies Section
Swiss Federal Office of Energy

IEA Wind TEM Social Acceptance of Wind Energy Projects, Markus Geissmann, SFOE, May 14 2012

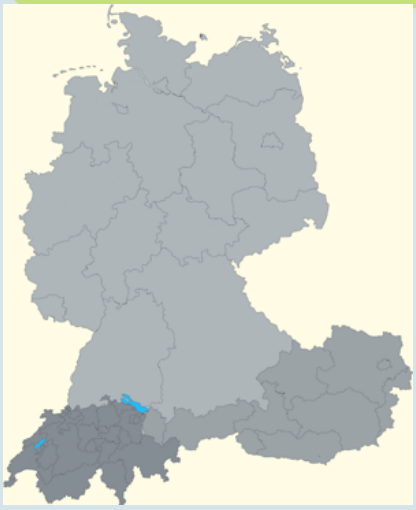
Switzerland Key Facts & Figures

- 40'000 km^2
- 7'950'000 inhabitants
- GDP 143'000 Mio CHF
- Power consumption 58.6 TWh

IEA Wind TEM Social Acceptance of Wind Energy Projects, May 14 2012
Markus Geissmann, SFOE

2

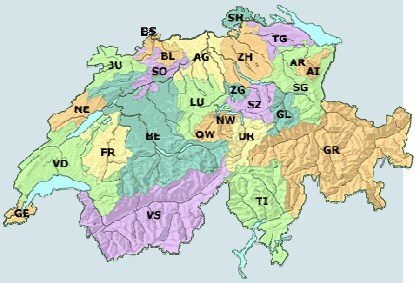
Switzerland Key Facts & Figures



Germany: 16 states

Austria: 9 states

Switzerland: 26 states (‚cantons')



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Switzerland Key Facts & Figures
Three political levels

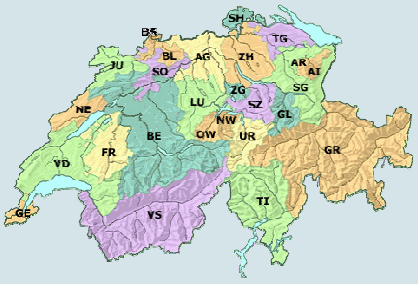
Confederation

⇑

Canton

⇑

Municipality



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Wind Energy Projects
The three steps of planning and approval

step	Political level
1. structure plan	Canton
2. land use plan	Municipality (Canton)
3. building permit	Municipality (Canton)

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The three steps of planning and approval
1. structure plan

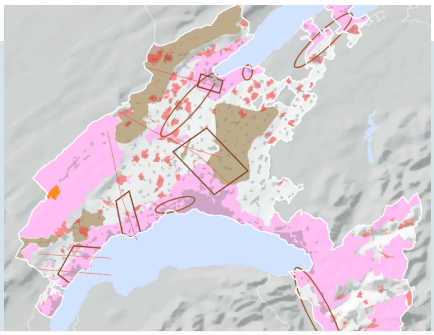
Defines the principles of a Canton‘s spatial development:

- Agricultural areas
- Areas for nature and landscape conservation
- Settlement areas
- Traffic, supply, infrastructure, …

Binding for authorities only

Wind Energy:

- eligible areas
- excluded areas



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The three steps of planning and approval
2. land use plan

Defines the allowable types of use for an area

- which use
- where, precise to the individual lot
- how many
- …

Binding for land owners
and authorities

Wind Energy:

- position of turbines, etc.
- dimension of turbines, etc.
- layout of roads, electrical grid
- construction areas
- future expansions
- ecological measures
- …

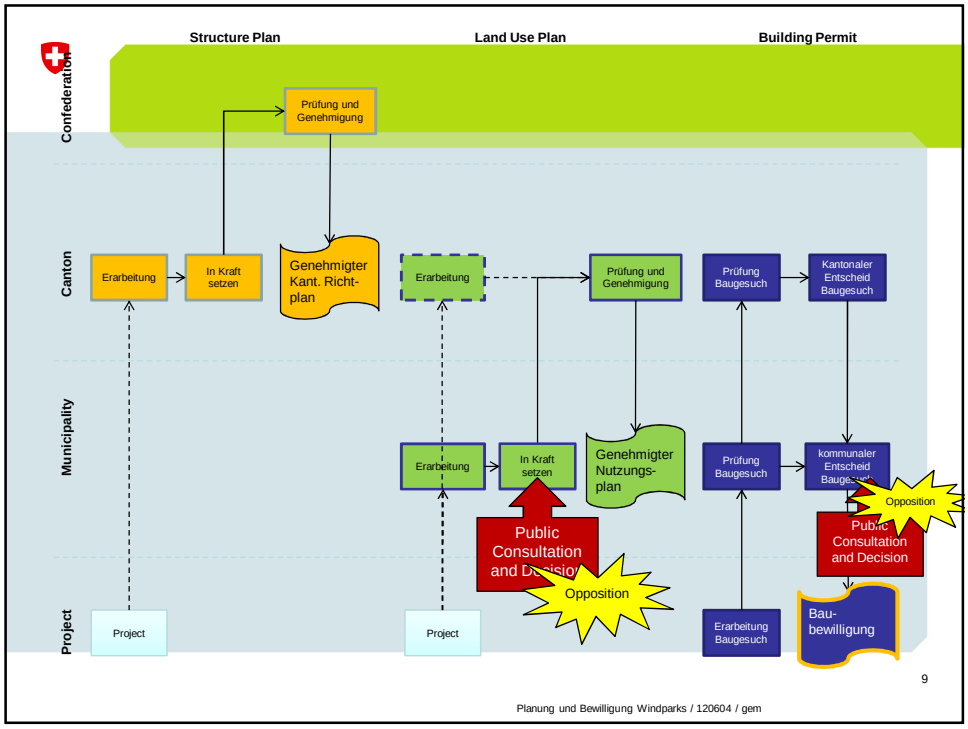
The three steps of planning and approval
3. building permit

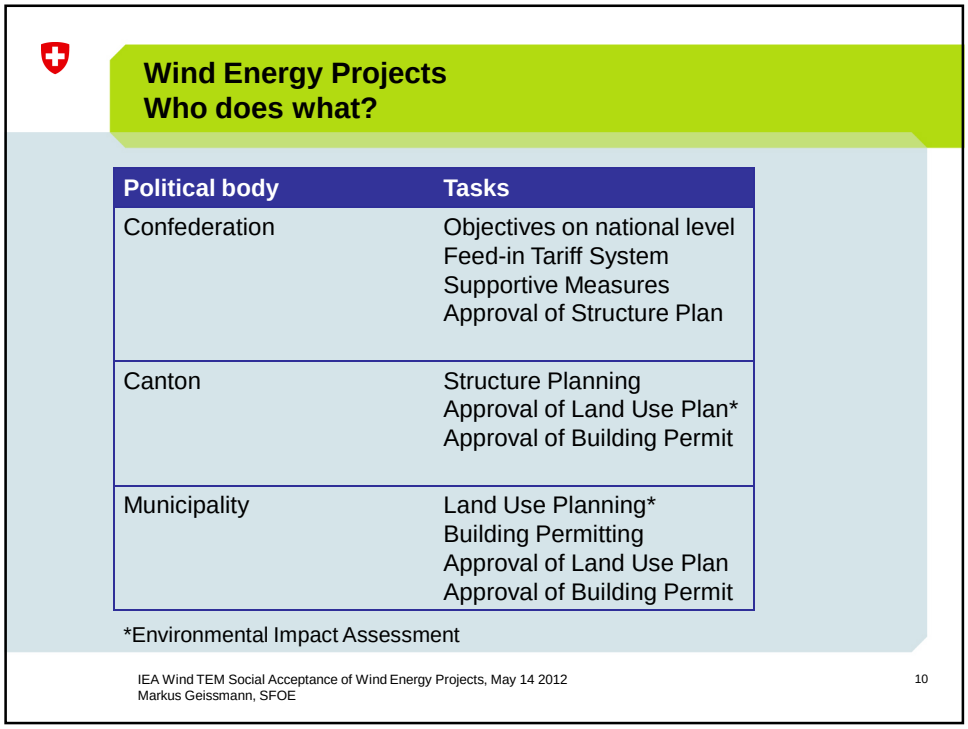
Declaratory ruling issued by the competent authority confirming that a construction project **complies with the building and planning regulations** and the procedural regulations for planning applications.

Binding for land owners
and authorities

Wind Energy:

- If the land use plan specifies the project in detail, obtaining a building permit is a legal formality.


Structure Plan
Land Use Plan
Building Permit
Confederation
Canton
Municipality
Project
Prüfung und Genehmigung
Erarbeitung
In Kraft setzen
Genehmigter Kant. Richt-plan
Erarbeitung
Prüfung und Genehmigung
Prüfung Baugesuch
Kantonaler Entscheid Baugesuch
Erarbeitung
In Kraft setzen
Genehmigter Nutzungs-plan
Prüfung Baugesuch
kommunaler Entscheid Baugesuch
Opposition
Public Consultation and Decision
Opposition
Public Consultation and Decision
Project
Project
Erarbeitung Baugesuch
Bau-bewilligung
9
Planung und Bewilligung Windparks / 120604 / gem


Wind Energy Projects
Who does what?
Political body
Tasks
Confederation
Objectives on national level
Feed-in Tariff System
Supportive Measures
Approval of Structure Plan
Canton
Structure Planning
Approval of Land Use Plan*
Approval of Building Permit
Municipality
Land Use Planning*
Building Permitting
Approval of Land Use Plan
Approval of Building Permit
*Environmental Impact Assessment
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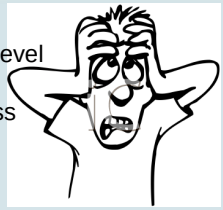
Planning and Approval Procedure
Risks and Chances



- Planning and Approval on Cantonal and Municipal Level
- 26 ‚different' Planning and Approval Schemes
- long and complicated Planning and Approval Process
- High Risk of Non Approval
- Asset protection very low

- local Participation is a MUST
- Projects adapted to local Circumstances (Development of Land Use Plan)
- local Utility Companies preferred
- Acceptance is high after Construction of Wind Park
- Expansion projects facilitated

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Planning and Approval Procedure
Future Improvements

Federal law:

- Cantons have to identify and secure areas for RE in their structure plans
- Energy Act: Wind energy (and all renewables) is a matter of public interest
- Time-limit for official expert opinions: 3 Months
- Objectives for renewable power 2035 and 2050

Federal level:

- Set objectives for renewable power for cantons:

2035	Wind	Hydro	Biomass	PV	Geothermal
Canton A	50 GWh	200 GWh	100 GWh	300 GWh	0 GWh
Canton B	250 GWh	30 GWh	50 GWh	500 GWh	50 GWh
Canton C	500 GWh	300 GWh	200 GWh	1‘000 GWh	100 GWh

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Planning and Approval Procedure
Future Improvements

Recommendations for Cantonal laws and processes:

- Cantons shall use a concentrated decision taking process
- Cantons shall give the possibility to execute the land use plan and the building permit process in parallel
- Projects within designated areas of the structure plan: Authorities shall use their margin of discretion *in favour* of the projects

Further measures:

- Clarify applicable regulations (environmental law)
- Creation of regional competence centers to support cantonal authorities and project developers in the planning and approval process

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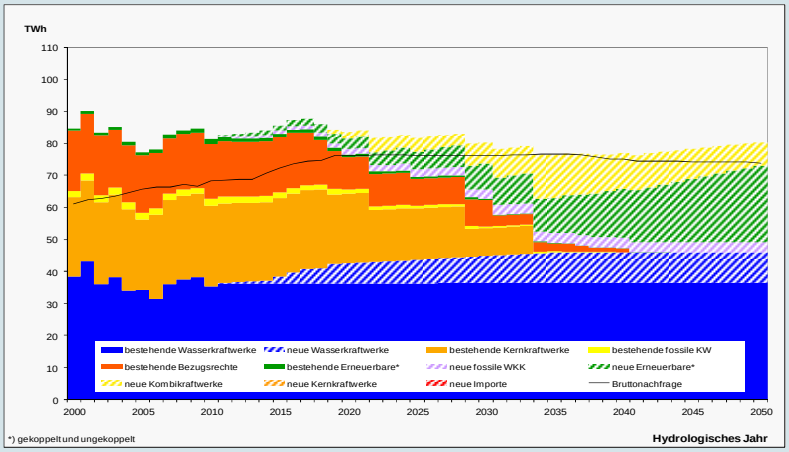
Thank you!

IEA Wind TEM Social Acceptance of Wind Energy Projects, May 14 2012
Markus Geissmann, SFOE 14

Projected Electricity Supply and Demand based on Energy Strategy 2050 Measures



Source: Prognos 2012

Additional Capacities of Renewable Energies until 2050 (without Hydro Power)

Renewable Energies in total:	**22,6 TWh**
PV	10.4 TWh
Wind	4 TWh
Geothermal	4.4 TWh
Biomass	1.1 TWh
Biogas	1.4 TWh
Sewage Treatment	0.3 TWh
Waste Incineration	1 TWh


Biomassezentrum Spiez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How Is Public Acceptance of Wind Facilities Priced Into The Housing Market?

Preliminary Results From Northeast US Markets

Ben Hoen
Lawrence Berkeley National Laboratory
bhoen@lbl.gov

IEA Social Acceptance of Wind Energy Projects TAM
June 15th, 2012
Biel, Switzerland

This work was funded by the Office of Energy Efficiency and Renewable Energy, Wind & Hydropower Technologies Program, of the U.S. Department of Energy

The Impact of Wind Facilities on Residential Property Values

- Subject Overview
- Previous Results
- NE Study Overview
- Preliminary Study Results
- Conclusions & Next Steps

Proximity, Aesthetics, and Property Values Are Strongly Linked

Highway	Transmission Lines	Average Home	Green Space	Ocean Front
↓ $	↓ $		↑ $	↑ $

Property value ~ "final word" (more on this later)
surveys results can be speculative &/or biased
purchases decisions are considered less speculative/biased

This linkage is well studied generally, but less for wind power facilities

Aesthetics & Property Values Rank As One Of The Top Of Concerns For Wind Energy Stakeholders

March 2012

Home > PROPERTY VALUE LOSSES NEAR WIND TURBINES GREATER THAN PREVIOUSLY THOUGHT, APPRAISERS SAY

PROPERTY VALUE LOSSES NEAR WIND TURBINES GREATER THAN PREVIOUSLY THOUGHT, APPRAISERS SAY

More March 2012 Articles Homes News property values wind wind energy wind farms wind turbine property values wind turbines

Share / Save

Losses can be up to 40%; values affected 3 miles from turbine sites

By Billie Jo Jannen

For East County Magazine

March 30, 2012 (San Diego's East County)–A real estate appraisal expert who has made a specialty of assessing impacts from nearby wind turbines has announced that he is revising his figures in response to a recent study of over 11,300 transactions near northern New York state turbine arrays.

Mike McCann of McCann Appraisal, LLC spoke at a Boulevard wind energy information meeting last winter and said property owners experience an average 25 percent value loss. At the time, he expected properties up to two miles away to experience value changes in response to turbine construction.

"I wish to refine my distance of forecast adverse value impacts to include at least three miles, should any 3 MW turbines be proposed by any of the developers in East County," McCann said. "Furthermore, property value guarantees should extend to this greater range to reflect the nuisance and stigma effect of more powerful turbines on marketing of homes."

The current study, released in July of 2011 by the Economic Financial Studies School of Business at Clarkson University, cites losses of up to 40 percent on properties located within 0.10 miles of new wind turbine facilities. This has prompted him to revise his loss figure upward to a maximum of 40 percent and expected adverse impacts out to three miles, with effects becoming less extreme with distance.

"The Clarkson study clearly shows value impacts out to three miles … and clearly shows the closer the turbine, the greater the impact," McCann said.

A Department of Energy-funded study originally released in 2009 by Lawrence Berkeley National Laboratory, often cited by wind proponents, says property value impacts are negligible and that effect of what is known as "wind farm anticipation stigma" goes away after the turbines are built. The Berkeley results are divided into sale values for pre-announcement, post-announcement and post-construction time periods. The study may be flawed, however, as it leaves out some of the very properties that might provide the most telling results, McCann said.

In the study footnotes, Berkeley authors specified that land without homes, properties of over 25 acres, homes where the sale price was thought to deviate too far from the norm and 34 repeat sales were excluded from the study.

A co-author of the study, SDSU Economic Department Chairman Mark Thayer, defended the exclusions as appropriate from a statistical standpoint and said he feels the Clarkson study supports the Berkeley conclusion that negative value impacts go away after the projects are built.

The Clarkson study is based mainly on pre-construction figures, Thayer said: "There is no impact. Property values do not go down near turbines."

However, real estate appraisers, which are closely regulated by the federal government, base their calculations on "comps," or nearby sales of comparative properties. A licensed appraiser would not have the luxury of leaving out the properties omitted by Berkeley, McCann said, so the older study does not offer a realistic assessment of the value loss that would be suffered by neighbors of turbine arrays. Statistically appropriate or not, those sales would not be excluded from an appraisal.

who've discovered their property values are going downward. (Dave Chidley/Canadian Press)

Property Value Concerns for Wind Fall Into Three Potential Categories

1. **Area Stigma:** Concerns that rural areas will appear more developed

No one will move here!

2. **Scenic Vista Stigma:** Concerns over decrease in quality of scenic vistas from homes

It will ruin my view!

3. **Nuisance Stigma:** Potential health/well-being concerns of nearby residents

I won't be able to live in my home!

Each of these effects could impact property values; none are mutually exclusive

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The Impact of Wind Facilities on Residential Property Values

- Subject Overview
- Previous Results
- NE Study Overview
- Preliminary Study Results
- Conclusions & Next Steps

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Growing List Of US Based Wind & Property Studies

Document Type Author(s)	Year	Number of Transactions/ Respondents	Before or After Wind Facility Construction	Area Stigma	Scenic Vista Stigma	Nuisance Stigma
Homeowner Survey						
Haughton et al.	2004	501	Before	- *	- *	
Goldman	2006	50	After	none		
Firestone et al.	2007	504	Before	- *	- *	
Expert Survey						
Grover	2002	13	After	none		none
Haughton et al.	2004	45	Before	- *	- *	
Goldman	2006	50	After	none		none
Crowley	2007	42	After	none	none	none
Kielisch	2009	57	Before[3]			- ?
Transaction Analysis - Simple Statistics						
Jerabek	2001	25	After			none
Jerabek	2002	7	After			none
Sterzinger et al.	2003	24,000	After	none		
Beck	2004	2	After			none
Poletti	2005	187	After	none		none
DeLacy	2005	21	Before[1]	none		
Goldman	2006	4	After	none		
Poletti	2007	256	After	none		none
McCann	2008	2	After			- ?
Kielisch	2009	103	After			- ?
Schneider	2010	2,330	Before	- */none		
Transaction Analysis - Hedonic Model						
Hoen	2006	280	After		none	
Hoen et al.	2009	7,459	Both	none	none	none
Laposa & Mueller	2010	2,910	After		none	
Hinman	2010	3,851	Before	- *		
Hinman	2010	3,851	After	none		
Heintzelman & Tuttle	2011	9,393	Mostly Before	- *		
Heintzelman & Tuttle	2011	1,938	Mostly After	none		

Main Findings & Limitations

- Inconsistent and often non-significant impacts
- Variety of samples showing similar results
- Many studies focused on one development (or small number)
- **Many studies lacking data near turbines**

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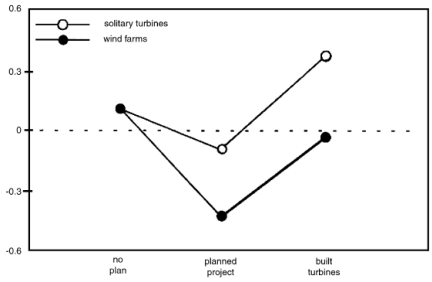
7

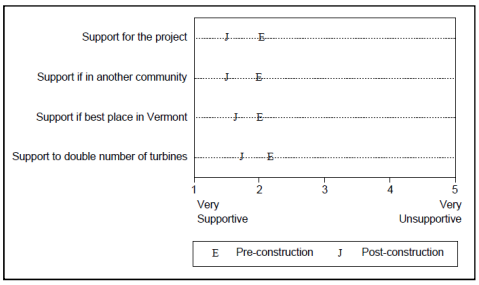
There Is Evidence That A "Valley" Might Exist Between The Pre-Announcement and Post-Construction Periods



Source: Wolsink, M. (2007) Wind Power Implementation - The Nature of Public Attitudes:

Wolsink found levels of support returned to neutral levels after operation

Palmer found levels of support increased after construction



Source: Palmer, J. (1997) Public Acceptance Study of the Searsburg Wind Power Project - One Year Post Construction.

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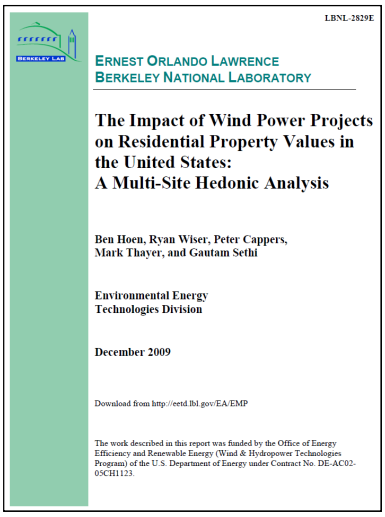
LBNL 2009 Study



LBNL-2829E

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis

Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Gautam Sethi

Environmental Energy Technologies Division

December 2009

Download from http://eetd.lbl.gov/EA/EMP

The work described in this report was funded by the Office of Energy Efficiency and Renewable Energy (Wind & Hydropower Technologies Program) of the U.S. Department of Energy under Contract No. DE-AC02-05CH1123.

Summary

- 7500 sales, 9 states, 24 facilities
- **125 sales post-construction w/in 1 mile**
- 98 sales pre-construction w/in 1 mile
- Multiple models, various effects tested

Conclusions

- Lack of consistent evidence of post construction effects based on distance from or view of turbines in all models
- Results indicate effects, if they do exist, are likely to be fairly small and/or sporadic

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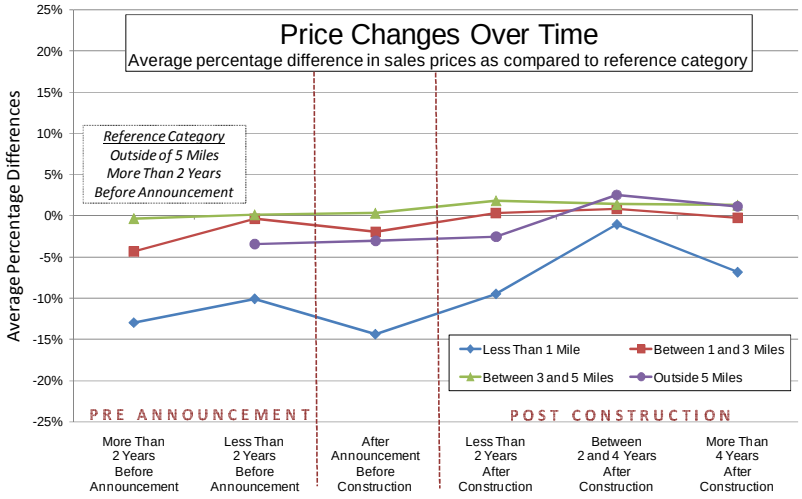
LBNL 2009 Study

Homes Nearest the Turbines Were Depressed in Value Before Construction and Appreciated the Most After Construction as Compared to Homes Further Away



The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility

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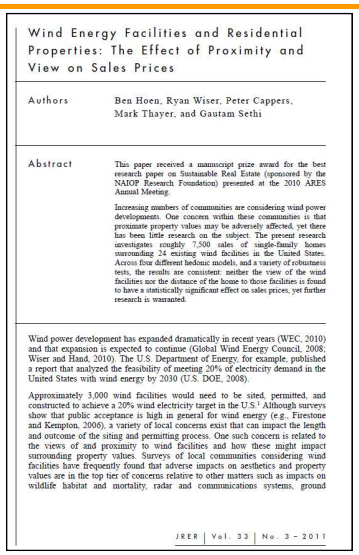
10

Hoen et al. (2011)

Journal of Real Estate Research paper that built on LBNL Report



Wind Energy Facilities and Residential Properties: The Effect of Proximity and View on Sales Prices

Authors: Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Gautam Sethi

Abstract

This paper received a manuscript prize award for the best research paper on Sustainable Real Estate (sponsored by the NAIOP Research Foundation) presented at the 2010 ARES Annual Meeting.

Increasing numbers of communities are considering wind power developments. One concern within these communities is that proximate property values may be adversely affected, yet there has been little research on the subject. The present research investigates roughly 7,500 sales of single-family homes surrounding 24 existing wind facilities in the United States. Across four different hedonic models, and a variety of robustness tests, the results are consistent: neither the view of the wind facilities nor the distance of the home to those facilities is found to have a statistically significant effect on sales prices, yet further research is warranted.

Wind power development has expanded dramatically in recent years (WEC, 2010) and that expansion is expected to continue (Global Wind Energy Council, 2008; Wiser and Hand, 2010). The U.S. Department of Energy, for example, published a report that analyzed the feasibility of meeting 20% of electricity demand in the United States with wind energy by 2030 (U.S. DOE, 2008).

Approximately 3,000 wind facilities would need to be sited, permitted, and constructed to achieve a 20% wind electricity target in the U.S.[1] Although surveys show that public acceptance is high in general for wind energy (e.g., Firestone and Kempton, 2006), a variety of local concerns exist that can impact the length and outcome of the siting and permitting process. One such concern is related to the views of and proximity to wind facilities and how these might impact surrounding property values. Surveys of local communities considering wind facilities have frequently found that adverse impacts on aesthetics and property values are in the top tier of concerns relative to other matters such as impacts on wildlife habitat and mortality, radar and communications systems, ground

JRER | Vol. 33 | No. 3 – 2011

Summary

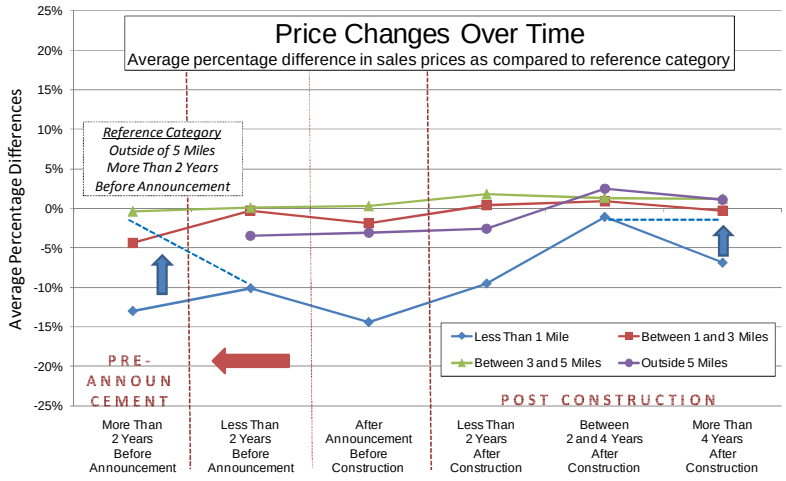
- Same data as LBNL report, but additional analysis (different models)

Conclusions

- Similar lack of evidence of post construction effects based on distance from or view of turbines as in LBNL report
- Some evidence post-announcement pre-construction effects exist that fade after turbines are in operation

Hoen et al. (2011)

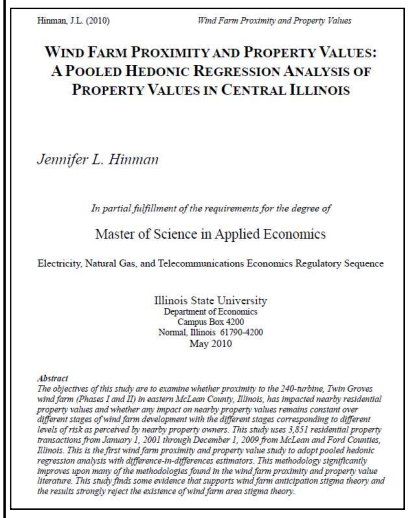
Some Evidence that Prices Are Affected in the Post Announcement Pre Construction Period and then Return to More Normal Levels Following Construction



The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility

Hinman (2010)

Twin Groves Wind Farm, McClean County, IL



Hinman, J.L. (2010) *Wind Farm Proximity and Property Values*

WIND FARM PROXIMITY AND PROPERTY VALUES: A POOLED HEDONIC REGRESSION ANALYSIS OF PROPERTY VALUES IN CENTRAL ILLINOIS

Jennifer L. Hinman

In partial fulfillment of the requirements for the degree of

Master of Science in Applied Economics

Electricity, Natural Gas, and Telecommunications Economics Regulatory Sequence

Illinois State University
Department of Economics
Campus Box 4200
Normal, Illinois 61790-4200
May 2010

Abstract

The objectives of this study are to examine whether proximity to the 240-turbine, Twin Groves wind farm (Phases I and II) in eastern McLean County, Illinois, has impacted nearby residential property values and whether any impact on nearby property values remains constant over different stages of wind farm development with the different stages corresponding to different levels of risk as perceived by nearby property owners. This study uses 3,851 residential property transactions from January 1, 2001 through December 1, 2009 from McLean and Ford Counties, Illinois. This is the first wind farm proximity and property value study to adopt pooled hedonic regression analysis with difference-in-differences estimators. This methodology significantly improves upon many of the methodologies found in the wind farm proximity and property value literature. This study finds some evidence that supports wind farm anticipation stigma theory and the results strongly reject the existence of wind farm area stigma theory.

Summary

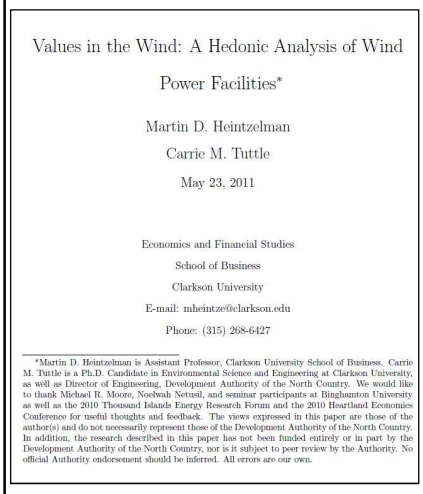
- 3,851 residential transactions
- 3 Development periods tested:
  - pre-announcement
  - post-announcement yet pre-operation
  - post-operation
- Multiple models, distance and development period effects tested

Conclusions

- Strong evidence that post-announcement pre-operation effects exist
- **Pre-Operation Effects range from -6% to -12%**
- Lack of evidence of post-operation effects exist

Heintzelman & Tuttle (2011)

Lewis, Lincoln and Franklin Counties, NY



Values in the Wind: A Hedonic Analysis of Wind Power Facilities*

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May 23, 2011

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Summary

- 11,331 residential transactions
- 1 development periods tested:
  - post-announcement
- Multiple models, distance effects tested

Conclusions

- Some evidence that post-announcement yet pre-operation effects exist
- **Effects can range from -6% to -16%**
- **Lack of evidence of post-operation effects exist**

Heintzelman & Tuttle (2011)

Lewis, Lincoln and Franklin Counties, NY

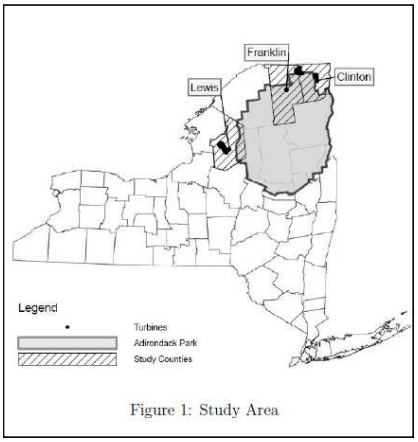


Figure 1: Study Area

Summary

- 11,331 residential transactions
- 1 development periods tested:
  - post-announcement
- Multiple models, distance effects tested

Conclusions

- Some evidence that post-announcement yet pre-operation effects exist
- **Effects can range from -6% to -16%**
- **Lack of evidence of post-operation effects exist**

Massachusetts Project Overview

Basic Research Questions

1) Is there evidence that proximity to turbines measurably affect sales prices within one mile?
2) Do the results change over time, and are there other observable impacts?

Relevance

Provides stakeholders in siting/permitting processes greater confidence in the likely effects of proposed wind facilities, allowing greater consensus on often-contentious setback requirements and viewshed valuations

Team

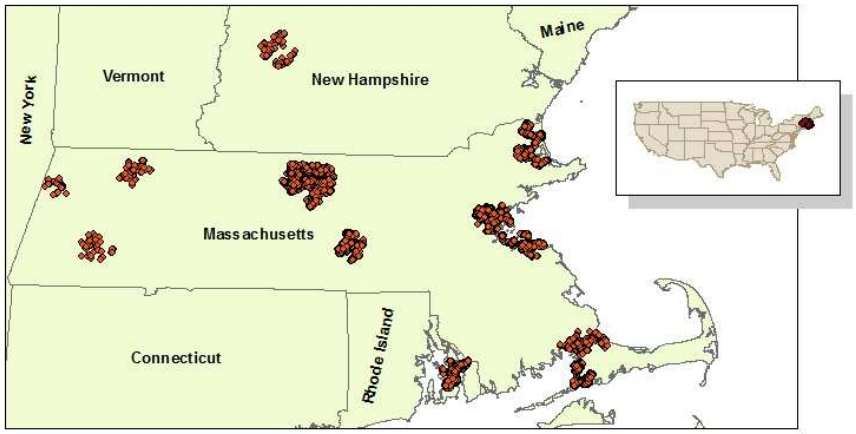
Massachusetts Clean Energy Center (MACEC) & Lawrence Berkeley National Laboratory (LBNL) **as Advisor**

Funder

MA CEC and U.S. Department of Energy Wind & Hydropower Technologies Program **(for LBNL Work)**

Collected Data from 3 States
Surrounding 34 Wind Facilities (~250 Turbines)

83,279 Residential Sales Transactions
66,350 Pre-Announcement, 10,317 Post-Announcement-Pre-Construction and **6,612 Post-Construction**



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Data Span Wide Temporal & Spatial Areas
Distance to Nearest Turbine at Time of Sale Is Determined

distance to turbine bins	facility development period v4							
	10-8yr pr	8-6yr pre	6-4yr pre	4-2yr pre	>2yr prea	postanc p	postcom	Total
0-0.5	47	138	139	145	126	120	152	867
0.5-1	873	1,331	1,569	1,404	1,185	916	880	8,158
1-1.5	1,168	1,444	1,699	1,485	1,223	1,072	850	8,941
1.5-2	1,408	1,696	2,273	2,151	1,592	1,382	883	11,385
2-3	3,009	3,536	4,593	3,761	3,118	3,163	1,749	22,929
3-5	2,770	3,280	4,106	4,075	3,479	3,664	2,098	23,472
Total	9,275	11,425	14,379	13,021	10,723	10,317	6,612	75,752

152 transactions occurred within ½ mile after the turbines were commissioned

And 1032 transactions inside if 1 mile

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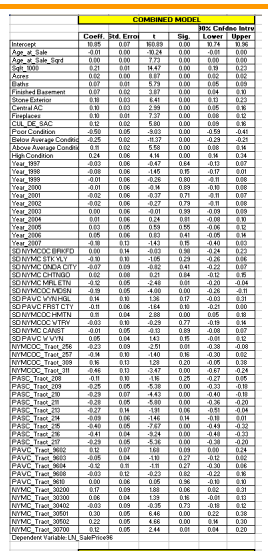
Hedonic Model



	COMBINED MODEL				95% Confidence Interval	
	Coeff.	Std. Error	t	Sig.	Lower	Upper
Intercept	10.85	0.07	160.69	0.00	10.74	10.96
Age_at_Sale	-0.01	0.00	-30.24	0.00	-0.01	0.00
Age_at_Sale_Sqrd	0.00	0.00	7.73	0.00	0.00	0.00
Sqft_1000	0.21	0.01	14.47	0.00	0.19	0.23
Acres	0.02	0.00	8.87	0.00	0.02	0.02
Baths	0.07	0.01	5.79	0.00	0.05	0.09
Finished Basement	0.07	0.02	3.97	0.00	0.04	0.10
Stone Exterior	0.18	0.03	6.41	0.00	0.13	0.23
Central AC	0.10	0.03	2.99	0.00	0.05	0.16
Fireplaces	0.10	0.01	7.27	0.00	0.08	0.12
CUL_DE_SAC	0.12	0.02	5.00	0.00	0.09	0.16
Poor Condition	-0.50	0.05	-9.63	0.00	-0.59	-0.41
Below Average Condition	-0.25	0.02	-11.37	0.00	-0.29	-0.21
Above Average Condition	0.11	0.02	5.59	0.00	0.08	0.14
High Condition	0.24	0.06	4.14	0.00	0.14	0.34
Year_1997	-0.03	0.06	-0.47	0.64	-0.13	0.07
Year_1998	-0.09	0.06	-1.45	0.15	-0.17	0.01
Year_1999	-0.01	0.06	-0.26	0.80	-0.11	0.08
Year_2000	-0.01	0.06	-0.14	0.89	-0.10	0.08
Year_2001	-0.02	0.06	-0.37	0.71	-0.11	0.07
Year_2002	-0.02	0.06	-0.27	0.79	-0.11	0.08
Year_2003	0.00	0.06	-0.01	0.99	-0.09	0.09
Year_2004	0.01	0.06	0.24	0.81	-0.08	0.10
Year_2005	0.03	0.05	0.59	0.55	-0.06	0.12
Year_2006	0.05	0.06	0.83	0.41	-0.05	0.14
Year_2007	-0.10	0.13	-1.42	0.15	-0.40	0.03
SD:NYMCOC:BRKFD	0.00	0.14	-0.03	0.98	-0.24	0.23
SD:NYMC STK VLY	-0.10	0.10	-1.05	0.29	-0.28	0.08
SD:NYMC OMDA CITY	-0.07	0.09	-0.82	0.41	-0.22	0.07
SD:NYMC CHTNGO	0.02	0.08	0.21	0.84	-0.12	0.15
SD:NYMC MRLETN	-0.12	0.05	-2.48	0.01	-0.20	-0.04
SD:NYMCOC:NEKN	-0.39	0.05	-8.00	0.00	-0.26	-0.11
SD:PAVC WYNHGL	0.14	0.10	1.36	0.17	-0.03	0.31
SD:PAVC FRST CTY	-0.11	0.06	-1.64	0.10	-0.23	0.00
SD:NYMCOC:HMTN	0.11	0.04	2.88	0.00	0.05	0.18
SD:NYMCOC VTRY	-0.03	0.10	-0.29	0.77	-0.18	0.14
SD:NYMC CAMST	-0.01	0.05	-0.13	0.89	-0.08	0.07
SD:PAVC W WYN	0.05	0.04	1.43	0.15	-0.01	0.12
NYMCOC_Tract_256	-0.23	0.09	-2.51	0.01	-0.39	-0.05
NYMCOC_Tract_257	-0.14	0.10	-1.40	0.16	-0.30	0.02
NYMCOC_Tract_309	0.16	0.10	1.28	0.20	-0.05	0.38
NYMCOC_Tract_311	-0.46	0.13	-3.47	0.00	-0.67	-0.24
PASC_Tract_208	-0.11	0.10	-1.16	0.25	-0.27	0.05
PASC_Tract_209	-0.25	0.05	-5.39	0.00	-0.33	-0.16
PASC_Tract_210	-0.29	0.07	-4.43	0.00	-0.40	-0.16
PASC_Tract_235	-0.28	0.05	-5.90	0.00	-0.36	-0.20
PASC_Tract_253	-0.27	0.14	-1.91	0.06	-0.55	-0.04
PASC_Tract_254	-0.09	0.06	-1.46	0.14	-0.18	0.01
PASC_Tract_295	-0.40	0.05	-7.67	0.00	-0.49	-0.32
PASC_Tract_296	-0.41	0.04	-9.24	0.00	-0.48	-0.33
PASC_Tract_297	-0.29	0.05	-5.36	0.00	-0.39	-0.20
PAVC_Tract_9602	0.12	0.07	1.69	0.09	0.00	0.24
PAVC_Tract_9603	-0.05	0.04	-1.30	0.27	-0.12	0.02
PAVC_Tract_9604	-0.12	0.11	-1.11	0.27	-0.33	0.09
PAVC_Tract_9608	-0.03	0.12	-0.23	0.82	-0.22	0.16
PAVC_Tract_9610	0.00	0.06	0.05	0.96	-0.10	0.10
NYMC_Tract_30200	0.17	0.09	1.88	0.06	0.02	0.31
NYMC_Tract_30300	0.06	0.04	1.39	0.16	-0.01	0.13
NYMC_Tract_30402	-0.03	0.09	-0.35	0.73	-0.18	0.12
NYMC_Tract_30501	0.30	0.05	6.46	0.00	0.22	0.38
NYMC_Tract_30502	0.22	0.05	4.66	0.00	0.14	0.30
NYMC_Tract_30700	0.12	0.05	2.44	0.01	0.04	0.20
Dependent Variable:LN_SalePrice96						

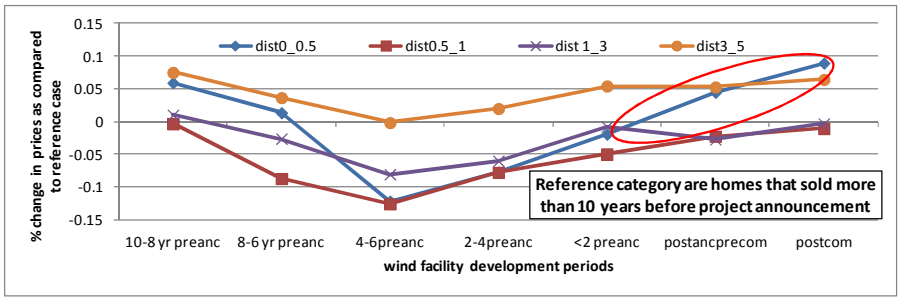
- **Well respected model** used by practitioners for over 40 years
- **Measures marginal price differences** between homes that vary by the variables of interest, and other controlling variables
- **Controlling variables** include square feet, acres, bathrooms, age and condition of the home, neighborhood, school district
- **Variables of interest** include, distance from turbines, development period (e.g. before or after construction began), distance to salt water, if home located in commercial zoning
- **Results and significance levels are important**

PRELIMINARY RESULTS

- Further robustness tests, peer review, and final analysis need to be conducted on these results.
- These results, therefore, should be considered **preliminary** and therefore could be different than what are published in the final report.

PRELIMINARY Data Do Not Exhibit Falling Prices Near Turbines

This implies no lasting impact



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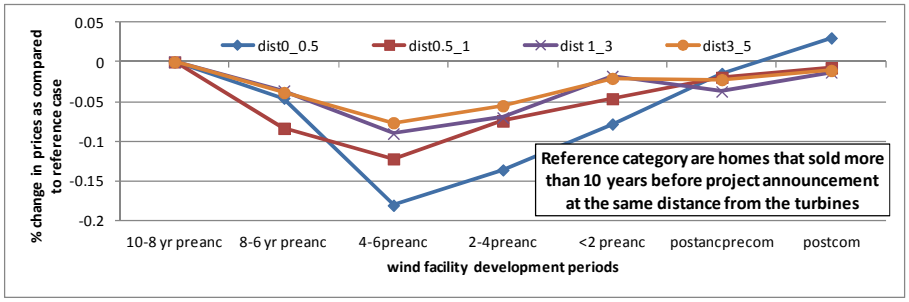
PRELIMINARY Data Show A Depression In Value Well Before Project "Announcement"

Especially for those homes nearest to the turbines.

The depression is fully corrected even prior to construction.



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PRELIMINARY Data Show Evidence Of Other Environmental Amenities and Disamenities

Homes were found to be ~ 6% **less** for each mile they were further from the waterfront (*p* value <0.01)

Homes located within a conservation area were found to be ~ 7% **more** than homes located in a residentially zoned area (*p* value <0.01)

Homes located within a commercial / industrial area were found to be ~ 5% **less** than homes located in a residentially zoned area (*p* value <0.01)

These results would seem to bolster those related to the turbines

Caveats

- **Results are preliminary**
- Property value ~ "final word"…It is unclear if all nuisance impacts are priced into the home
- Wind facility impacts might differ from these "average" impacts
- These results do not tell us why this is occurring
- These impacts could potentially underestimate actual impacts if neighbor agreements transfer with home

Status and Other Projects And Questions

MA Project Status: Project team currently estimating final models. Final report expected near the end of the summer.

Other Projects – Other Questions

1) LBNL Led Project – Analysis will begin on full US dataset (including this MA dataset) next month and report should be complete early next year.
2) This analysis will consider the frequency of sales of homes near the turbines to answer, "If proximate homes are NOT SELLING?"
3) Possible Questions for Later: Survey of home buyers/sellers; correlation with modeled sound levels; survey of valuers in wind counties; correlation with development process…
4) Book with other valuers in UK and Australia to come out next year on this subject and effects related to high voltage transmission lines.

Thank You

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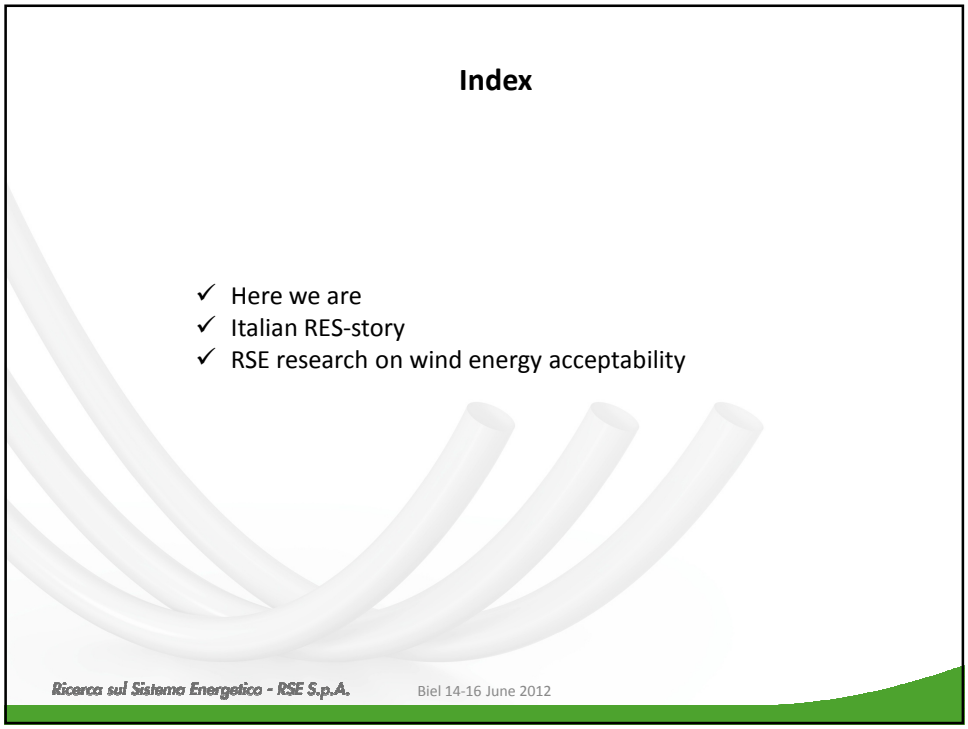
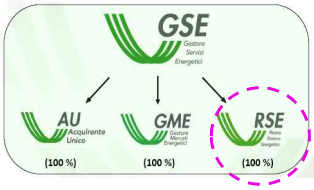
RSE
Ricerca Sistema Energetico
14-16 June 2012
Wind energy and local development:
an Italian way to social acceptance
Main Topic: New issues influencing social acceptance
Cristina Cavicchioli


Index
✓ Here we are
✓ Italian RES-story
✓ RSE research on wind energy acceptability
Ricerca sul Sistema Energetico - RSE S.p.A.
Biel 14-16 June 2012

Here we are!



RSE is part of GSE group, the state-owned company which promotes and supports **renewable energy sources** (RES) in Italy. It manages **support schemes** for renewable energy sources (RES) at central level, with different solutions, which take into account the different technologies of the plants and the level of maturity of the related markets.

In the group **RSE** has the mission to perform **research** activity on the energetic system.

Research on National and EU project

RSE S.pA.: Research on Energetic System

GENERATION SYSTEM

- Thermoelectric generation
- Renewable and distributed generation
- Industrial safety and innovative nuclear generation
- Hydrogen and fuel cells
- Concentrating photovoltaics

DEVELOPMENT OF ELECTRIC SYSTEM

- Electric demand and active
- Final use efficiency
- Electro energetic Scenarios
- Grid development and reliability

T&D TECHNOLOGIES

- Innovation in grid technologies
- Supply quality and distribution grid
- test on electrical components
- Asset management

ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

- Renewable energy and territory
- Hydric resources and hydroelectric safety
- Meteorology and meteo climatic risks
- Environ. assess. of thermoelectric generation
- CO_2 geological segregation and territory

Italian RES – story

- 1982: act n. 308/82 - liberalization of electricity production for RES plant <3MW
- 1991-92: act n. 9/91 on retirement obligation and priority dispatching, the price of RES electricity; CIP 6 mechanism (fixed price for each RES) (0.114 €/KWh at 2010)
- 1999: DL 79/99: GREEN CERTIFICATE, mechanism to improve the RES contribution: each electricity producer need to put into the grid 2% of RES (0.087 €/KWh at 2010)
- 2001 Review of V Title of Italian Constitutional Act: Energy attributed to Regions
- 2 more supporting schemes (up to 0,407 €/KWh at 2010)

✓ Absence of uniform central planning criteria for RES
✓ Too many different incentive scheme in 10y: uncertainty in economic investment refund

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….*follows*: Italian RES – story

From 2010:
•EU directive => PAN EU => Burden Sharing
•Guidelines on FER planning: region should identify only “not eligible” areas
•New incentive policy

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Italian RES – story

PAN: National Action P lan

EU Directive goals

Target on Gross Final Energy Consumption at 2020: (Primes value for 2009 : 145,6 Mtep)

- PAN Target value at 2020: **133,02 Mtep** (by energetic efficiency); - 20% respect to PRIMES 2007 BAU scenario (159,7 Mtep)

Target on RES: 17% (22,6 Mtep) at 2020: (in 2010 were 8,05% = 10,6 Mtep)= 12 Mtep in 10y

Target on transport: 10% from RES at 2020 (-6% di CO2): 2,9 Mtep

	2005			2020		
	[MW]	[GWh]	[ktep]	[MW]	[GWh]	[ktep]
Hydroelectric	**15.466**	**43.767**	**3.764**	**17.800**	**42.000**	**3.612**
< 1MW	391	1.851	159	650	2.281	196
1MW - 10 MW	1.947	7.391	636	3.250	9.796	842
>10 MW	13.128	34.525	2.969	13.900	29.923	2.573
Of which for pumping	1.334	1.268	109	2.600	2.730	235
Geothermal	**711**	**5.325**	**458**	**920**	**6.750**	**581**
Solar	**34**	**31**	**3**	**8.600**	**11.350**	**976**
Photovoltaic	34	31	3	8.000	9.650	830
Concentration	-	-	-	600	1.700	146
Marine energy: wave, tide, currents	**-**	**-**	**-**	**3**	**5**	**0**
Wind energy:	**1.639**	**2.558**	**220**	**12.680**	**20.000**	**1.720**
Onshore	1.639	2.558	220	12.000	18.000	1.548
Offshore	-	-	-	680	2.000	172
Biomass:	**937**	**4.675**	**402**	**3.820**	**18.780**	**1.615**
Solida	653	3.477	299	1.640	7.900	679
Biogas	284	1.198	103	1.200	6.020	518
Bioliquidi	-	-	-	980	4.860	418
TOTAL	18.787	56.356	4.847	43.823	98.885	8.504

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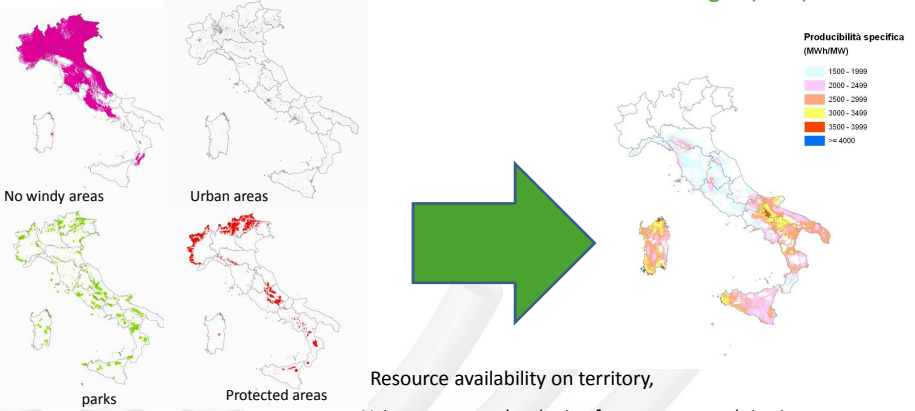
Italian RES – story

Burden Sharing

Goal:
ensure that RES regional plans lead to achieve the national target (PAN)



Resource availability on territory,

- Using proven technologies for resource exploitation;
- Resource exploitability according to sustainability criteria;
- Coherence between RES development with grid development plans;
- regulatory constraints acting on national level.

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Italian RES – story
2010 – Italian Guide lines on RES planning

- Each region have to identify only "not eligible" areas (criteria)
- Wind is not a local resource that need grant to be exploited
- No royalties: compensation mechanism should be coherent with the impact (environmental, economic…)

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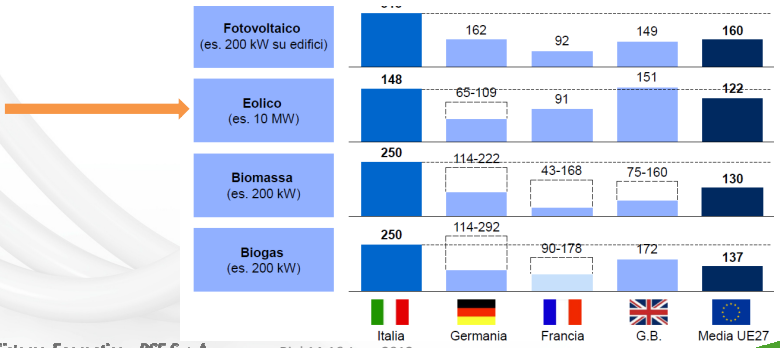
Italian RES – story

New incentive scheme

- **Incentive value convergent to European average value**
- A "annual incentive roof" to control the annual RES power, for avoiding too fast growth (ex: solar 2008-2011)
- Energy sources coherent with National Action Plan (PAN), and premium for **„virtuous" technology** (ex. low environmental impact, innovation,…)

€/MWh remuneration (Italian data normalized on 20y and yearly hour of prod.)



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RSE research on wind energy acceptance

Wind Energy and Local development

RSE has understood how crucial is to address the issue of local development to achieve the objectives of global policy (es.:20/20/20)

Goal:
understand and analyze the conditions under which the construction of wind farms is able to promote the development of the territory

RSE research on wind energy acceptance

Wind Energy and Local development

Starting analysis: the actors and their relationships

Goal:

identify of social, cultural, economic indicators to define **cluster of suitable/critical territorial identity** (territorial marginality, cultural fragmentation, social exclusion, *green economy* vocation, social cohesion, culture and community participatory ....)

How:

- dynamic observation of the territory
- levers to integrate wind power with the socio / economic context
- attitudes with respect to the territorial issue of the impact

RSE research on wind energy acceptance
Focus on wind energy industry

Map and relationship analysis on wind energy industrial chain

chain: in "wide" meaning

=> representative picture of a young industrial sector
⇒Companies characteristics and their relationships (productive, functional, technological, market relationship…), in order to define the added value chain
⇒More than 150 industries "mapped"

RSE research on wind energy acceptance
Supporting second phase

The largest wind power development in Italy has enabled
- the development of an Italian wind industry chain.
- the growth of many "new" jobs
- a wide range of highly specialized skills

New "boundary conditions"
- a severe economic crisis
- the policies have changed incentives for renewable
- globalization forcing

=>"**new deal**" a "**second phase**" for wind energy in Italy

New relationship between wind plants and population

RSE research on wind energy acceptance
Supporting second phase

The characteristics of this emerging phase:

✓**Renewable and developing local awareness** – the key active role of local administrators in the planning of the exploitation of energy resources in the area. Their role should be to "short circuit" the needs, opportunities and enhance the human and economic resources of the territory

✓**Renewable and agriculture** - enhance the production of renewable energy, stimulating and supporting the important role of agriculture as the first defense of the territory, the green economy

✓**Renewable and spatial aggregation**. The governance of RES must be an element that encourages local governments to find a suitable size for their coordinated management (ex. as for dams)

✓**Renewable and multi-utility smart grid**. The development of the smart grid presents opportunities to rural territories. Moreover, the development of multi-utilities to manage the sources is in fact a solution for challenging territories.

RSE research on wind energy acceptance

Supporting an integrated development of RES at local scale

Low Social Acceptance: No NIMBY

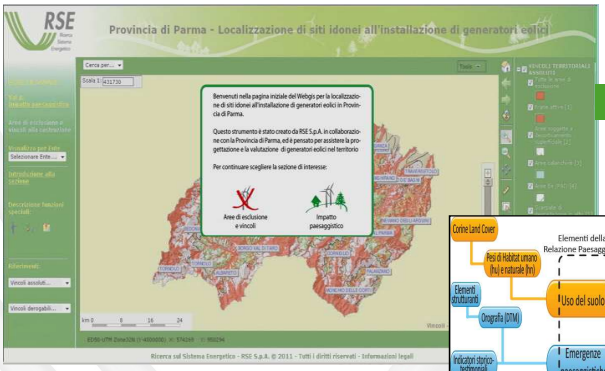
Low Social Acceptance: symptom of low inclusion of the project with local culture and sensitivity

What to do?

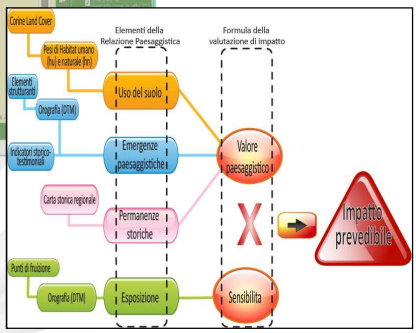
- ✓ Monitor Social Acceptance and sensitivity indicators,
- ✓ Prevent low Social Acceptance causes supporting Italian «new deal»
- ✓ Development of SW tools for better inclusion of population in decisional process and governance

RSE research on wind energy acceptance

Supporting an integrated development of RES at local scale



http://map.rse-web.it:8082/parma



- Bottom-up approach
- Heritage protection
- Enhance local resources

cavicchioli@rse-web.it

Social Acceptance of Wind Energy after Fukushima: Sociopolitical Changes and Problems

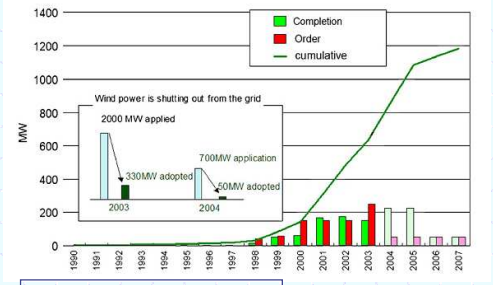
Yasushi MARUYAMA Nagoya University

Status of social acceptance before 2011

- Acceptance divide
  - Highly acceptance as alternative option
  - Strong opponent
- General acceptance had been decreasing
  - (Infra) sound
  - Landscape
  - Nature conservation (bird issue)
- Little acceptance in national policy and utilities
  - Developers should be “tough” => “Gentle” developers disappear
- Distribution problem
  - Local society vs. Outsider developers

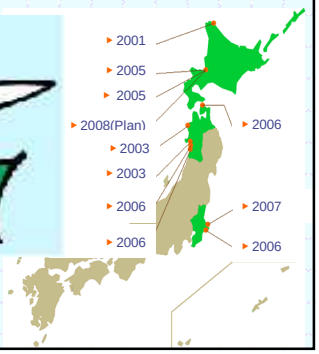
2

Acceptance divide

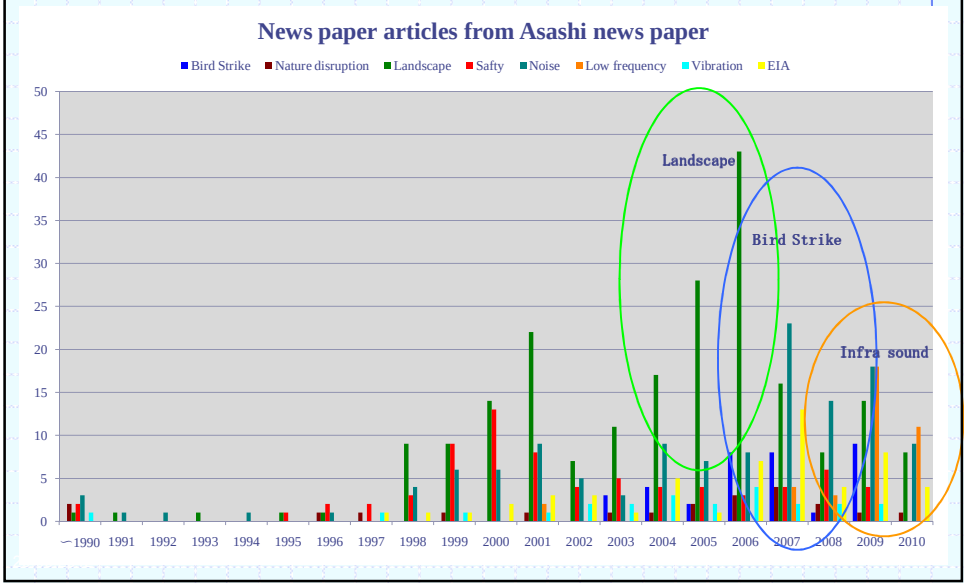


Maruyama, et al., 2007, 2763

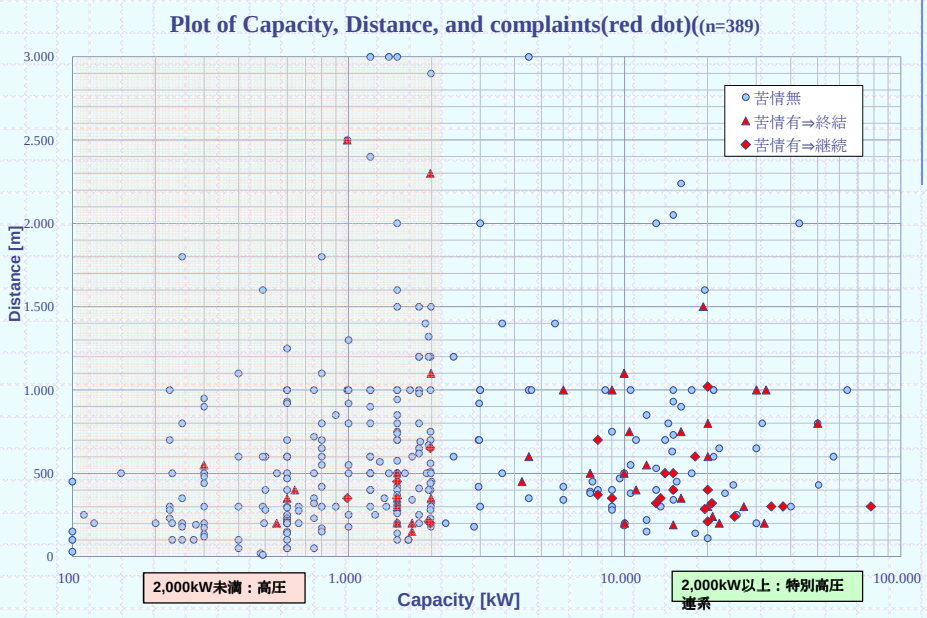
Asahi-shinbun
28.09.2006



General acceptance

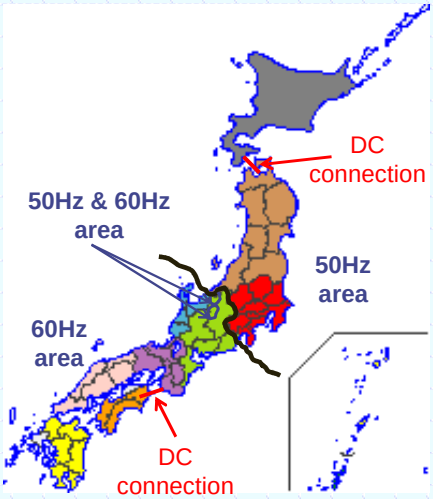


Status of social acceptance before 2011



Grid Issue

- Inter-grid connection and electric power companies -

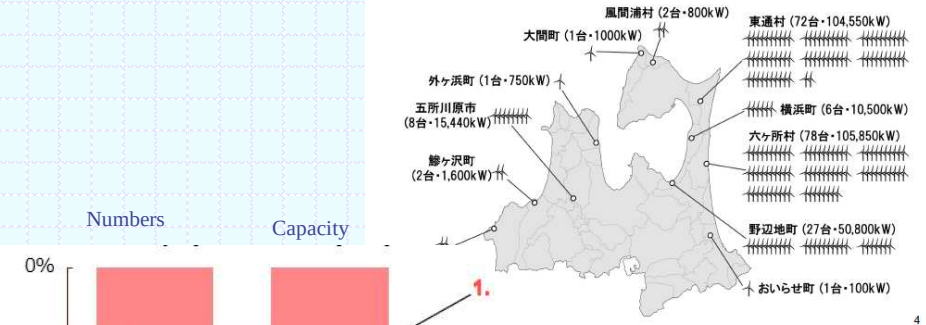


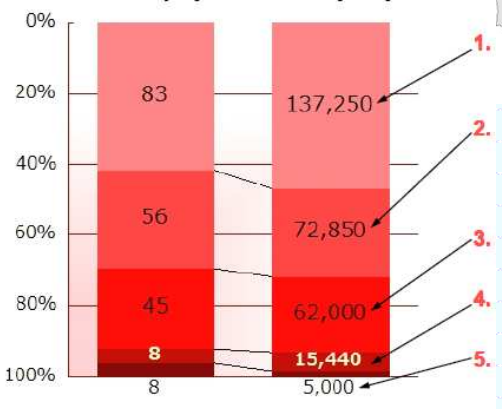
The map from wikipedia

- 50Hz, 60Hz and 50 &60Hz
- DC connection among Hokkaido, Honsyu and Shikoku
- 10 electric power companies are in charge of one area each.
- They have exclusive authority and responsibility (keep in balance of demand and supply in every 30min.) to operate and manage transmission networks.
- Liberalization for customer of more than 50kW.
- High ancillary service cost (30 euro cent/ kWh)
- Some windfarms equip with battery system.

Japan IEA Task28 Wind Acceptance, 27. September 2010, in Dublin

Status of social acceptance before 2011





8 projects of local society

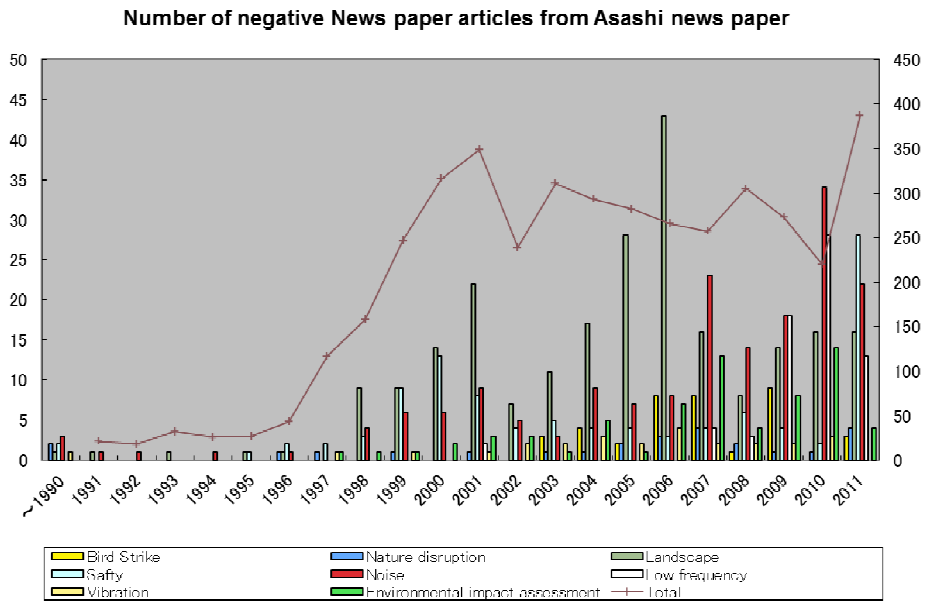
7

Changes after Fukushima Event 1

- General acceptance jumped up
- Changes in policy
  - FIT(too good?) starts soon
    - Tariff is 23 yen (more than double as before)
    - No statement about reduction
  - Inter grid connection will be more active (without ancillary service cost)
  - Some offshore projects financed by national government
  - Environmental impact assessment low
- Companies are rushing to new business
  - 3240MW for 910MW grid capacity (North area)
- Community power become more famous

8

Social acceptance in the medea



Problems still remain

- Big issues
  - Dependence on nuclear power
  - Liberalization of electricity
  - Grid issue(lottery)
  - Fragmentation of policies (national, local)
- Anti-wind power movements are still active
- Community power is still weak
  - Lack of knowledge and experts (e.g. project finance, due diligence, O & M, contracts…)
  - Lack of initiative of local people
- Developers are clever to be “kind”
  - Offering guarantee of high availability (with double price)
  - Offering full support of developing process (after local industry has finished complex process of social consensus building)
  - Offshore project as symbol of “restoration” (without communicating with fishers)

10


New trend: Wind farm of citizens cooperative in Tokyo
Energy autonomy by the citizen!
グリーン電力供給のスキーム図
生活クラブ首都圏4単協
出資・融資
融資の返済
電気料金の支払い
電気の供給
一般社団法人グリーンファンド秋田（夢風）
Summit energy
電力小売会社（PPS）
生活クラブ風車
夢風
ゆめ かぜ


生活クラブ風車 竣工式
夢風
祝 生活クラブ風車

New trend?: transparency

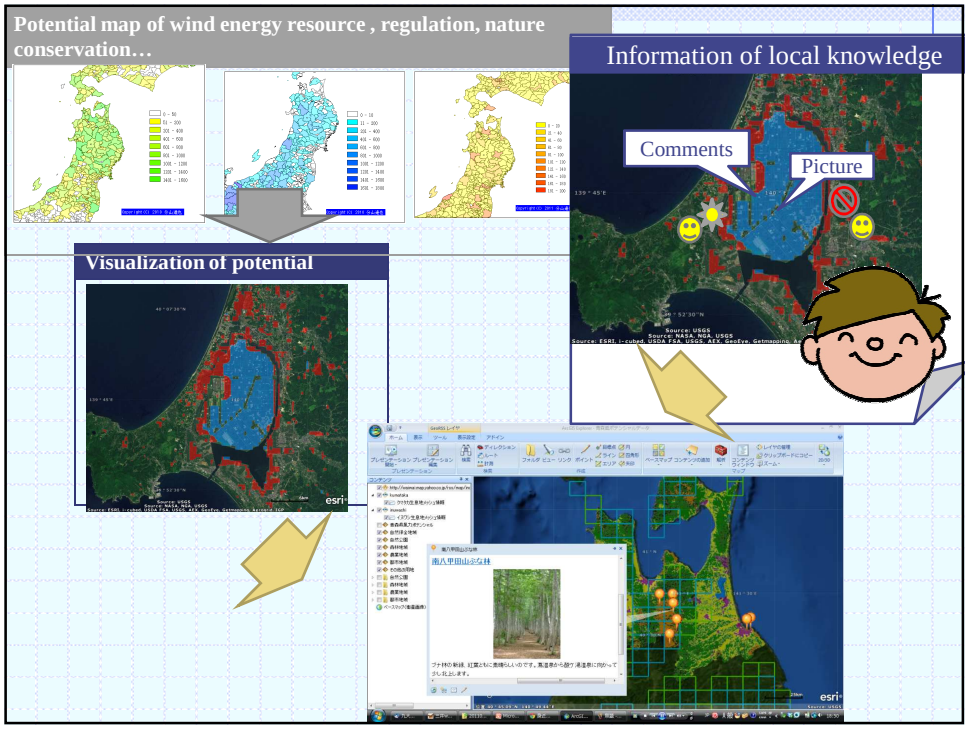
- A project lead by NGO
- Disclose almost all information “before” going through critical parts
  - Honest (known unknown uncertainty..)
  - Ready to accept any comment
- Local residents trust them => “de facto” first option
-

14

Coming practice

- Community power project as a learning process
- Zoning system with local knowledge
- Adaptive management to reduce bird issue
- Bird detector
  - One example of R&D suggested by social acceptance
  - 20% errors in 340m (of all moving objects)
  - Very cheap (Usual high resolution)
- Community power guideline
  - Zoning
  - Distribution
  - Adaptive management with monitoring

15



Open your mind. LUT.

Lappeenranta University of Technology

Farming wind in a city – acceptable or not?

Sari Janhunen
South Karelian Institute,
Lappeenranta University of Technology,
P.O.Box 20, 53851 Lappeenranta, Finland

IEA R&D Wind Task 11 – TEM on
”Social Acceptance of Wind Energy Projects”
June 14 th to 16th , 2012 Biel, Switzerland

Case-study area in a city

First pilot results and comments from an on-going research project that follows the implementation of a wind power project **inside a city structure** in a Finnish city, Kotka. Kotka is located on the coast of the Baltic Sea.

Map from website http://www.vtt.fi/windenergystatistics

Background

The Finnish National Climate and Energy Strategy 2008: 6 TWh / years using wind power in by 2020.
→ Increase in total national wind power capacity to around 2 000 MW (at the end of year 2011 in Finland 197 MW)

Kotka is located in a province, which has prioritized wind power development in order to fulfill the national energy strategy and to create a wind power cluster for producing wind energy equipment, components and services.

The aim is to construct no less than **100 wind turbines** in the Kotka-Hamina region of Finland.

The city wind farm Kotka was planned to have **20 wind turbines**. Now studied plans consists of 7-9 wind turbines, capacity of 2-3 MW each.

Research questions

Do the citizens living near (0-600 meters or 600-1000 meters) to proposed wind turbines have more negative attitude to environmental impacts of wind energy production than citizens living afar (1000 or 2000 meters)?

Is the city and people living there ready for the change of image from old industrialism to new industrialism?

Acceptable or not? First impressions

Citizens feel difficult to answer questions about wind power (are the results whole ”truth”?)

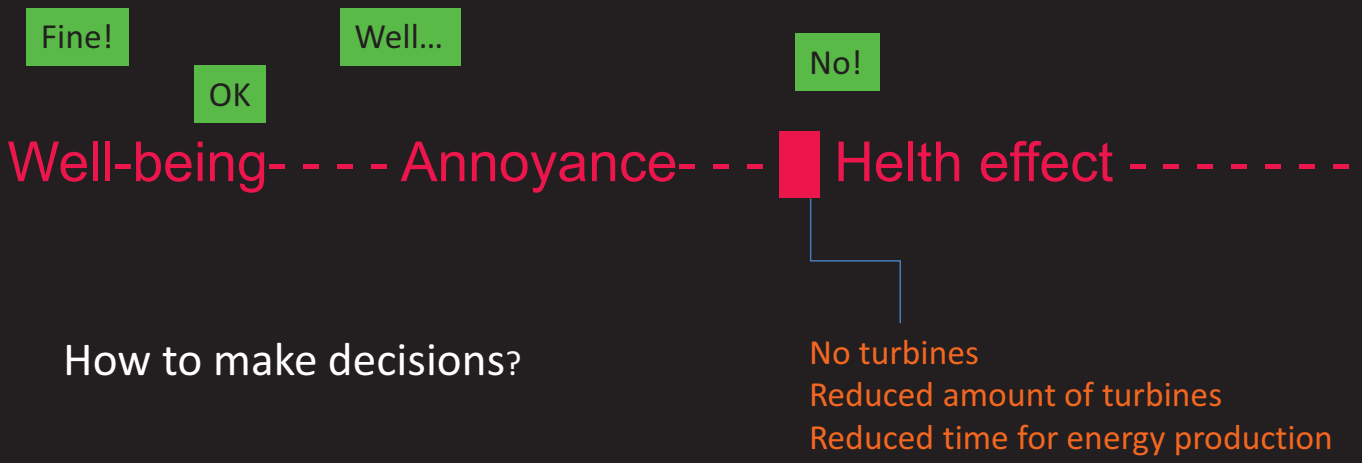
People living near have real fears and worries;

Nimby is far too simple explanation

Environmental impacts have to be taken seriously, even in industrial environment (same level of noise may still be different)

Limits for acceptable impacts

Noise flickering landscape wildlife safety



How to make decisions?

No turbines
Reduced amount of turbines
Reduced time for energy production

Do we need some new limits?

Thank you!

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Impacts from Deployment Barriers on the United States Wind Power Industry: *Overview & Preliminary Findings*

IEA Wind: Task 28 Topical Expert Meeting
Biel, Switzerland

June 15, 2012

Eric Lantz, Suzanne Tegen, Maureen Hand, and Donna Heimiller: NREL

NREL/PR-6A20-56155

This work was supported by the U.S. Department of Energy under Contract No. DE-AC36-08-GO28308 with the National Renewable Energy Laboratory.

This work has been funded by the Wind & Water Power Program of the Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy under Contract No. DE-AC36-08GO28308

Presentation Overview

- Background
- Developer perspectives and decision-making
- Land area and resource potential impacted by barriers
  - Public acceptance
  - Radar
  - Wildlife
  - Transmission
- Conclusions

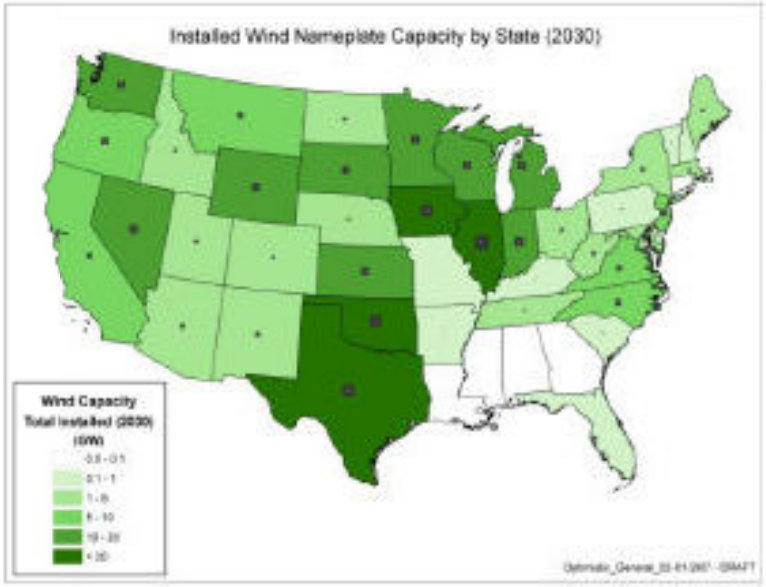
Background

- Regardless of cost and performance, some wind projects cannot proceed to completion as a result of "deployment barriers."
- Even if wind was unquestionably competitive on purely economic grounds, there would be many places in the United States where developers would not build due to various non-technical barriers.
- Current methods for developing research agendas and understanding non-technical barriers facing the industry fail to:
  - Accurately characterize the costs to the industry imposed by deployment barriers (as a result of project delays, increased permitting stringency, and failed projects)
  - Define the extent of the challenges faced by the industry.
- Barriers must be better understood and quantified.

Primary Objectives

1. **Quantify the potential impact of barriers on developable capacity (MW)**
   - Utilize semi-structured interviews with developers and GIS datasets to better understand the impacts on the industry

2. **Quantify the potential impact of barriers on the installed costs *and* total system cost from 20% Wind**
   - Collect data from developers and consultants detailing actual or representative costs for developer operations, technical studies, permitting fees, etc.
   - Estimate relative cost of 20% Wind at various levels of barrier stringency



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Developer Perspectives and Decision-making

Development Time Horizon Is 5+ Years

- Typical project is planned on a 5-year time horizon.
  - 12 years maximum reported, but it is increasingly difficult to justify a project timeline of more than 5 years.
  - Interconnection alone can require 3-4 years.
  - Timelines are likely extended if:
    - Projects include post-construction work (additional 2-4 years)
    - NEPA or comparable state environmental processes are triggered (additional 1-2 years)
    - Land management plans need revision (additional 1-2 years)
    - Litigious opponents are present (additional 1-2 years)
- U.S. Fish and Wildlife Service guidance indicates movement toward longer lead times and more upfront data collection.
- More time required for development = higher capital investment.
  - Typical initial development cost estimates: $30/kW - $50/kW – however costs may exceed $150/kW in extreme cases
  - Example: a 60 MW project has been in development for 8 years with $6.1 million in costs thus far
    - Equates to a cost of $100/kW (in development costs alone) with still no assurance of a successful project
  - "Mitigation costs" can add substantial additional costs (e.g., $20/kW - $40/kW or more)

Development timeline ranges vary greatly. Uncertainty is the greatest challenge in terms of timing for developers

Explore and Engage Barriers Early, Often

- Deployment barriers begin to factor in at the very first prospecting stage and must be managed throughout the development process.
- A strictly linear development approach will not proceed rapidly enough and may over-commit developers.
  - Development processes occur in parallel.
  - Issue resolution is ongoing and part of every step.
- Policy risk is substantial.
- Deployment barriers alone do not block success.
  - A project with a buyer can spend more to mitigate barriers.
  - Projects with few or no issues may fail anyway, as a result of insufficient demand.

Industry Has Gained Sophistication Over Time

- **Development process is evolving and market analysis is more thorough:**
  - 2000-2005: buy land in the good wind resource sites
  - 2005-2010: buy windy land close to transmission
  - 2012: find the market for potential PPA
    - Emerging development model: individual utilities as clients
    - Projects are chosen to meet a specific "client" need (e.g., local wind for RPS)
    - Utilities want to see more projects in their service territory – long haul power exports are increasingly difficult to sell

- **Multiple variables shape developer strategies and prospective sites**
  - Market
  - Competition
  - Transmission/ available interconnection
  - Protected/ sensitive areas (environmental, radar, cultural)

- **Better market analysis, better success rates**
  - 2000-2005, success rates were about 1 in 10
  - 2012 success rates are improving: in some cases, 1 in 3 projects are successful

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Land Area and Resource Potential Impacted by Barriers

Public Acceptance Approach

Initially we developed two analysis scenarios

- A moderate-level barrier consistent with the current market conditions and the trajectory we anticipate in the absence of any deliberate actions to mitigate public acceptance barriers
  - 1,500 ft no build buffer; Cost adder ($75/kW) buffer from 1,500 ft to 2,000 ft
- A more extreme barrier case, but one that is still within the realm of possibilities based on current public debates
  - 2,500 ft no build buffer; Cost adder ($125/kW) from 2,500 ft to 3,000 ft
- Each scenario includes a 'no build' buffer zone and a 'cost adder' buffer zone
  - Cost adders were determined by analysis of the direct cost data and the additional costs that could result from increased spending on public meetings, permitting, land acquisition as well as more expenditures for wildlife studies resulting from greater public scrutiny of a project

Recent Modifications

- Scenarios outlined above do not allow for the possibility that some of the proximate residences could be project participants and therefore have likely signed away any non-safety setback rights
- Preliminary findings suggest developers are building in locations with up to 5 residences per square mile; assuming roughly a third to a half of those residences are project participants (e.g., leaseholders) suggests that we can build generally wherever we want when there are only two project residences per square mile
- Revised approach
  - Filter out all the locations that have only 2 occupied landscan cells per square mile
  - Apply the buffer zones (i.e., no build and cost adder) only to those regions that have 3 or more (>2) occupied landscan cells

Wildlife Approach

1. Quantify entire habitat or migratory path impact
2. Refine habitat and migratory areas
   - Show percentage of habitat or migration corridors impacted instead of entire species distribution

Emphasis on:

- Species at risk for collision (Indiana bat, Whooping Crane)
- Species with habitat at risk (Prairie Chickens, Sage Grouse)
- Protected species with broad-based habitat (Golden & Bald Eagles) – New regulations to require an Eagle Conservation Plan

Databases: USGS, The Nature Conservancy, USFWS, others

Next Steps:

- Incorporate most recent policies/guidance
- Collect and incorporate peer review input

Radar Approach

Plot Sub-barriers (defined by NOAA):

1. Remove from consideration (3km and under)
2. Potential mitigation required (>3km-26km)
3. Consultation (>26km-57km)

Measured by: Distance to radar tower

Databases: NOAA, NRDC Radar includes Airport Surveillance, Air Route Surveillance, Next Generation Weather and Terminal Doppler Weather Radar

Next Steps: Refine radar datasets, incorporate new data and insights as they become available; engage DOD and FAA for additional data

Radar Insights from Developers

- **Radar barriers are improving but can still present challenges**
- **DOD/FAA database of radar towers has assisted prospecting effectiveness significantly**
  - Response time may still be problematic
  - It may be difficult to discern the appropriate level of mitigation
- **Developers rely on FAA database of hazard determinations**
- **General strategy is primarily mitigation, but some areas are simply avoided**

Transmission Approach

- **Analyze impacts of changes in available capacity**
  - Baseline in 20% = 10% availability
  - Sub scenario 1% availability (high barrier) + no new inter-regional transmission
  - Sub scenario 1% availability (medium barrier)
- **Include case study from one balancing area**
- **Possibly use modeled transmission availability data to conduct a more refined nationwide analysis**

Transmission Insights from Developers

- **Transmission is observed to be a major challenge; projects fail as a result of:**
  - Limited availability (of lines or capacity),
  - No cost effective delivery (e.g., due to wheeling charges, high interconnection costs)
- **Transmission/Interconnection is among the highest risk endeavors**
  - There is significant uncertainty in the processes
  - Proceeding through the interconnection review/study process requires significant sums of money, portions of which are not refundable
  - System operator assumes everyone in front of you in the queue is going to build
- **Queuing and power sales contract timing requirements may be mismatched**
  - System operator wants you ready for construction, utility wants an interconnection agreement in hand

Preliminary Conclusions

- **Deployment barriers including public acceptance are important but market fundamentals ultimately rule the day.**
- **Deployment barriers appear to have a larger impact on the developable wind resource; impacts to COE, however, are not trivial.**
- **Analyzing the impact of deployment barriers on a broad basis presents significant data, modeling, and analysis challenges**
  - There is an exception to every rule
  - Sometimes the target is moving

Thank You

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Source: NREL PIX/#05593

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Impact of Wind Turbine Obstruction Markings on Residents

Gundula Hübner & Johannes Pohl
Health and Environmental Psychology Work Group
Martin-Luther-University Halle-Wittenberg
Germany

funded by

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Landesamt für Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein

IEA Meeting in Biel, Switzerland, June 2012

Situation

- increased wind turbine height
  total height > 100 m
- aircraft obstruction markings obligatory
- neighbour complains

⟶ stress effects of obstruction markings unknown

⟶ open question whether regulations are necessary

Comparisons

three types of day marking

	Xenon	LED	red-white-red
simple landscape			
complex landscape			

- day / night (red lights)
- synchronized / non-synchronized lights
- with / without light intensity adjustment
- highly / non-annoyed subjects

Method

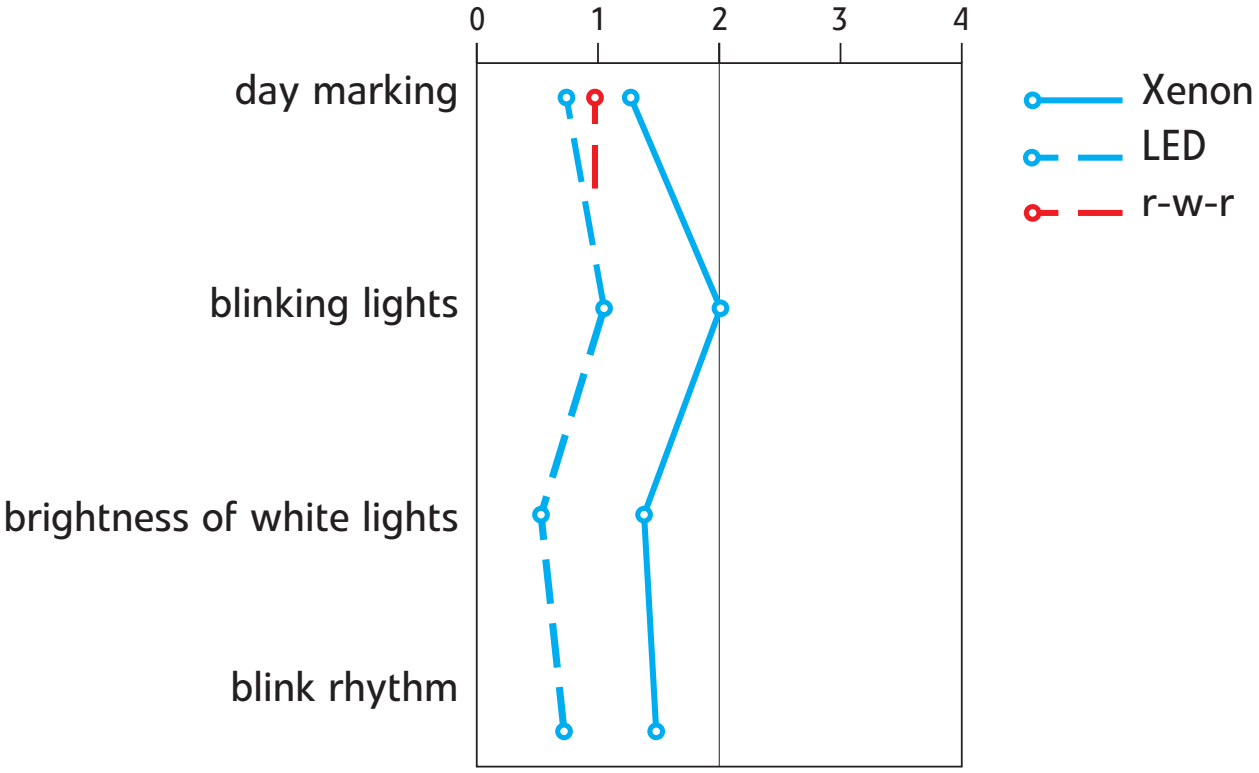
- methods of stress and environmental psychology
- 420 neighbours with wind park view
- research conditions comparable regarding age, gender
- questionnaire survey

Questionnaire

- 590 questions (items)
- stress indicators, e.g.:
  - annoyance
  - somatic and psychological well-being
  - stress coping activities
- acceptance: renewable energy, wind energy, specific park
- sociodemographic features

Selected Results

I myself feel annoyed by …



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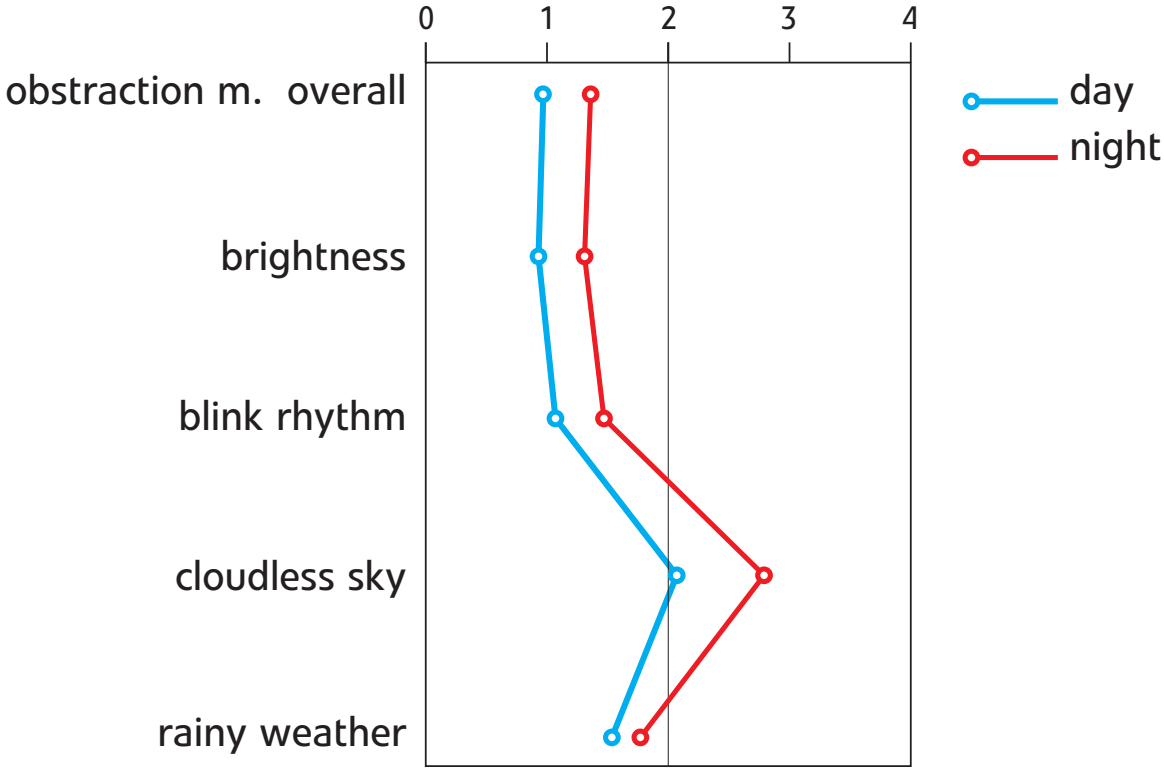
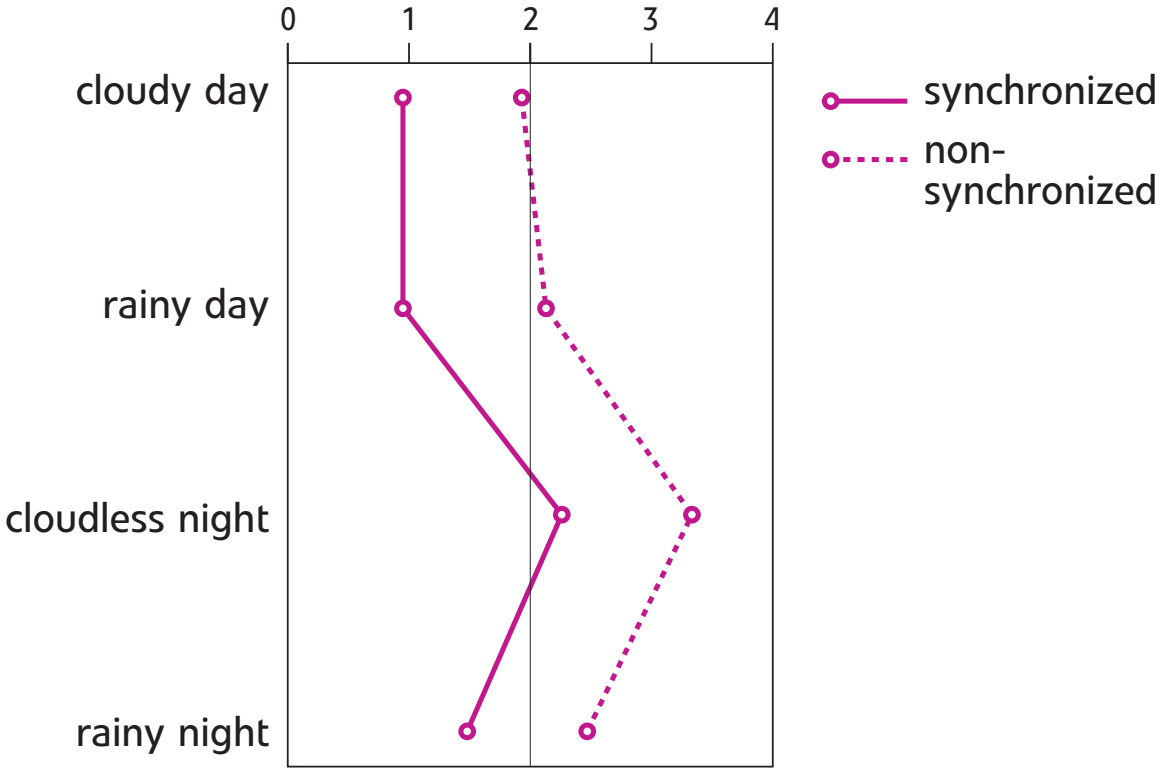


I myself feel annoyed especially by …



Subjects without light intensity adjustment

- applying blinds
- staying less time in bedroom
- taking sleeping pills

Strongly annoyed residents

- 16 % of respondents
- home workers
- property owner
- more health problems
- greater emotional instability
- greater light sensitivity
- more frequently xenon-lights
- larger wind farms

Summary and Recommendations

- total sample: no substantial annoyance
- single case: strong annoyance possible
- problematic: cloudless night, Xenon
- obstruction markings influence general acceptance

Promote Acceptance

- LED or red-white-red
- synchronize
- light intensity adjustment
- demand-oriented navigation lights
- positive, transparent planning and building process

running projects

- impact of noise – interdisciplinary case study
- impact of wind turbines on residents – Swiss national survey
- acceptance of transmission lines – best practice process evaluation
- planned: Japan – Germany comparison


Thank You!

ETH Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

LEC Laboratory for Energy Conversion

Wind Turbine Architectural Design for Improved Social Acceptance.

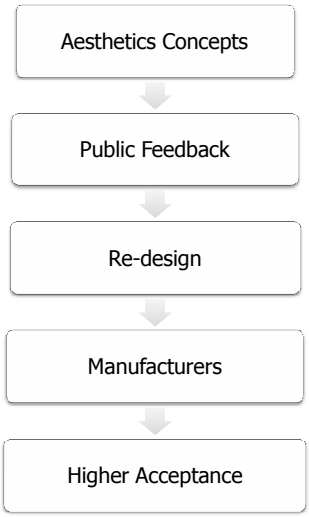
Dr. Anna P. Gawlikowska

Biel, June 15th, 2012

ETH Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

LEC Laboratory for Energy Conversion

Paradigm Shift



ETH Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

LEC Laboratory for Energy Conversion

Presentation Outlook

1. Laboratory for Energy Conversion
2. GIS Econometric Tool - *Wind*Seeker
3. Social Acceptance & Visual Impact
4. Design versus Acceptance
5. Project Structure
6. Wind Turbines Architectural Solutions
7. Visual Impact Plugin
8. Surveys
9. *Wind*Seeker Application

Friday, June 15th, 2012 | Institute for Energy Conversion : Wind Energy | 3

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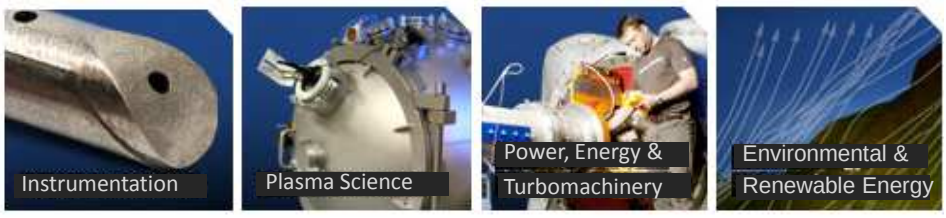
LEC Laboratory for Energy Conversion

LEC Activities

Laboratory for Energy Conversion



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LEC Laboratory for Energy Conversion

LEC Research Activities in Wind Energy

Laboratory for Energy Conversion

- Integrated Risk Management Tool - *Wind*Seeker
- CFD Computation
- Modeling of flows
- Wind parks location optimization
- Experiments
- Large Scale Wind Turbine Measurements
  - Drones *Wind*Flyer
  - Probes
  - Liadar scanners *Wind*Rover
- Sub-scale Turbine Facility

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Social Acceptance & Visual Impact

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LEC Laboratory for Energy Conversion

LEC *Wind*Seeker

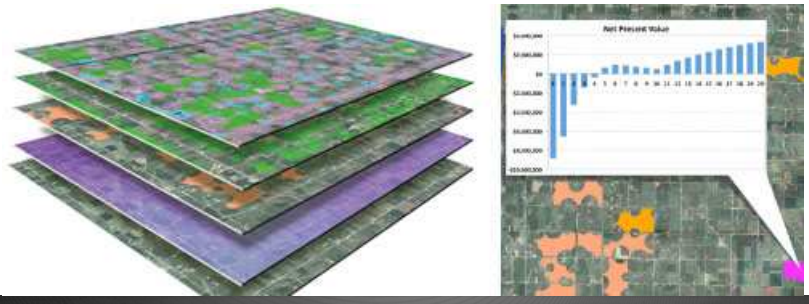
Previously Mapped States : USA (eg. Iowa), Germany.

Complexity (150 modules)

Flexible (Allowing Scenarios Creation)

GIS Based, Systematic & Holistic

enviromental characteristics	natural features	anthropological elements	regulatory policies	investments & costs	risk measurments



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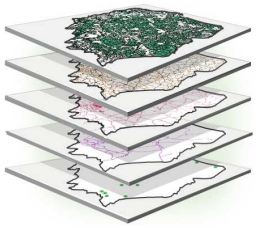
LEC Laboratory for Energy Conversion

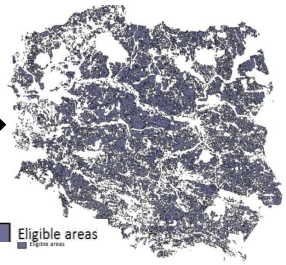
LEC *Wind*Seeker

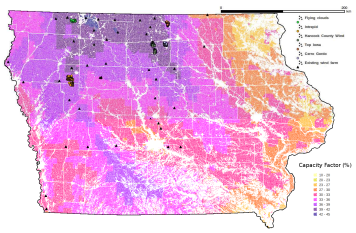
300km



Regulatory Constraint

- Settlements
- Roads/Railways/...
- Rivers/Lakes/...
- Transmission Grid
- Existing Wind Farms
- .....





Mapped Countries

eg. Germany, Poland

Results

Proposed Locations

Possible Capacity

Eligible Area

IRR

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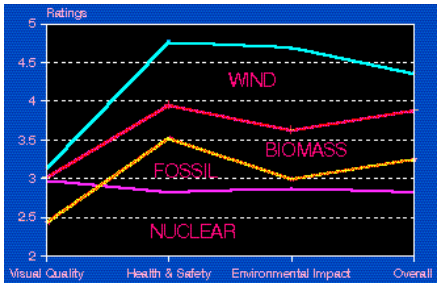
Social Acceptance & Visual Impact

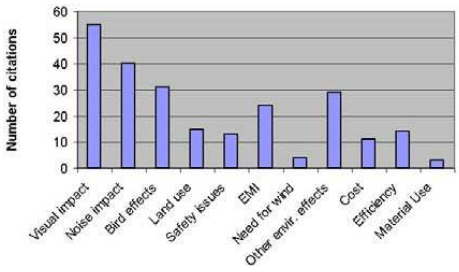
The Visual Impact of on the landscape

is an important motivation for opposition.

(Graham et al., 2009; Warren et al., 2005; Zoellner et al., 2008)



Power Plant Preference
(Gipe, P. 2002)



Factors affecting public acceptance in Sweden.
(Devlin, E., 2002)

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Design versus Acceptance

Form Improvement

- Aesthetic
- Characteristic

Improved Visual Image results

- Improved mental image
- Better quality of life

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Project Structure

- Architectural Concept
- Mechanical Design
- Visualisation, Coding
- Public Survey
- Acceptance Validation
- Communication Package

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Wind Turbines Architectural Solutions

Design	Form	Color	Function	Mimicking
Setting	Landscape			
Scale	Size	Density	Distance	

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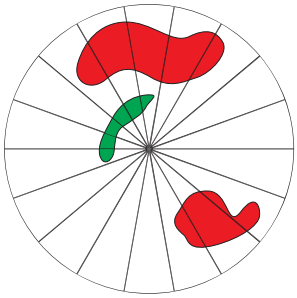
Visual Impact Plugin : Visibility



Eligible Area
Obstructions

Portion of field of view occupied by an object

Depends on:

- Observer Position
- Observed Object
- Obstacles

Realization

Development of a plugin for GIS basing on the Eligible Areas output of the *Wind*Seeker.

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Visual Impact Plugin : Subjectivity

Acceptance in function of the Design and Landscape Type

- Value of Landscape
- Preferred Design
- Wind Park Density & Scale

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Planned Use of Surveys

Preparatory Stage

- Application of Sociological & Psychological Knowledge
- Survey Interface Preparation

Surveys Results

- Designs Validation
- Data for Subjectivity Plug-In
- Feedback Loop into Architectural Design

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Future usage for Policy & Mediation

Acceptance level for different design scenarios for a given eligible area.

Feedback

- Update Type Ranking
- Update Eligible Area

Usage in discussions with

- Policy Makers
- Other Stakeholders

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Swiss Federal Institute of Technology Zurich

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Laboratory for Energy Conversion

Thank You

Contact:
Dr. Anna P. Gawlikowska
gawlikowska@lec.mavt.ethz.ch

Conflict Around the Location of a National Test Center large WT: A study of the public debate

Dr Kristian Borch, Technical University of Denmark

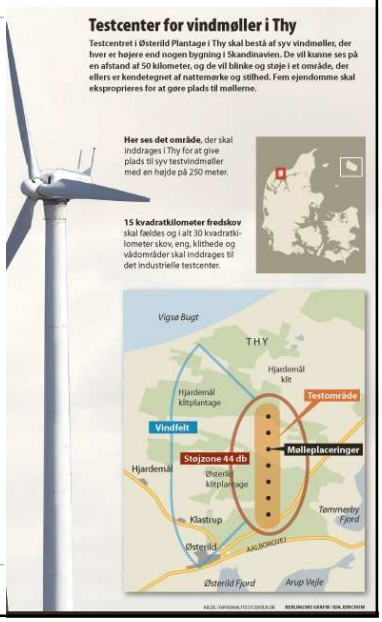
DTU Management
Institut for Planlægning, Innovation og Ledelse

What to expect

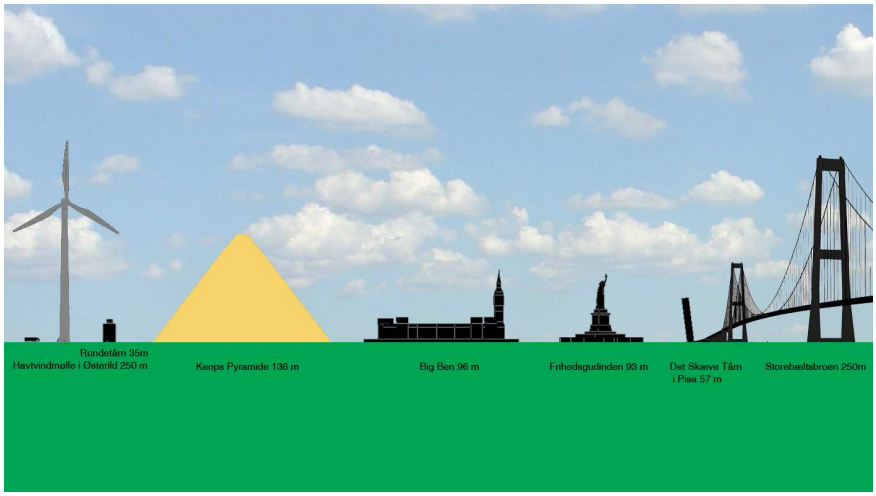
- The Case: Planing of a national test center for very large off shore wind turbines
- Theoretical tour de force
- Dialogue process and rise of conflict
- Conclusion and recomendations
- Planed research

The Case

- A test center for offshore wind turbines is planned to take up 30 km^2 of land in the north west of Denmark.
- The Danish minister of the environment Troels Lund Poulsen announced on 30th September 2009, the clearing of 15 km^2 of forest and expropriation of homes.



Visualisation



Theoretical Perspective

Discourse theory: Identify where different discourses collide and conflict emerge on the right to describe a phenomenon (e.g. wind power is environmental friendly / not)

Conflict theory: Recognizing that people need to be empowered before they can recognize different perspectives than their own (e.g. public involvement)

Technical push vs. public/market pull

Positivism vs. Constructivism

Dialog?!

Authorities (municipality or the state) has the responsibility to create dialogue concerning the need for the particular project.

The developer has the responsibility to communicate around the particular project.

The citizens can contribute with support, engagement and local knowledge.

MILJØMINISTERIET

By- og Landskabsstyrelsen

[redacted]

Vicedirekteren
J.nr.
Ref. jac

Den 30.09.2009

Invitation til informationsmøde for lodsejere

Regeringen har besluttet at placere et nyt nationalt testcenter for hav- og landvindmøller i Østerild Klitplantage.

Din ejendom beliggende [redacted] 9741 Frøstrup ligger inden for det påtænkte projekts beregnede støjkonsekvenszone på 44 dB, og vil derfor i givet fald blive særlig berørt. Din ejendom vil formentlig vil blive ubeboelig, såfremt testcenteret skal anlægges. Det kan derfor betyde, at staten vil starte en proces for overtagelse af ejendomme i støjkonsekvens-zonen på 44 dB.

For at sikre en god dialog og proces for den enkelte lodsejer, vil vi gerne invitere dig til et informationsmøde for alle berørte lodsejere torsdag den 8. oktober 2009 kl. 17:00 i Multihallen i Østerild.

Endvidere sender vi dig en invitation til et offentligt møde den 8. oktober 2009 kl. 18:30 i Multihallen i Østerild

Der vedlægges et ideoplæg, som er i offentlig høring indtil den 19. oktober 2009. Du har i denne høringsfase mulighed for at komme med ideer, forslag og kommentarer til det videre arbejde. Du kan læse mere om ideoplæg og testcenter på By- og Landskabsstyrelsens hjemmeside på www.blst.dk.

Har du spørgsmål om informationsmødet og den kommende proces er du velkommen til at kontakte Skov- og Naturstyrelsen i Thy på tlf. 97 97 70 88.

Med venlig hilsen

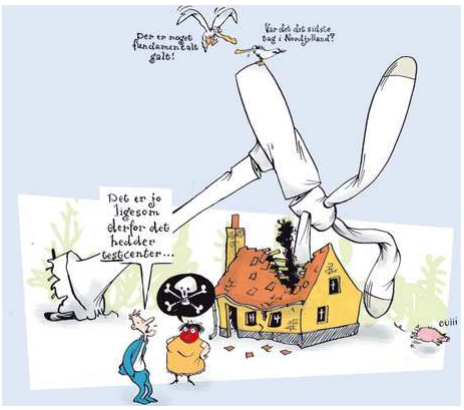
Sven Koefoed-Hansen

DTU

Points of Conflict 1 of 3

- Nature values: different view on nature values
  - No artificial light in the area
  - Silence
  - Landscape
  - Classified forest vs Dune plantation
  - Open landscape vs Forest

Different ways of seeing the beauty of wind power



Points of Conflict 2 of 3

- All environmental and landscape issues has been / not been considered!
  - Opponents has a strong case since the impact assessments have not been up to standard (law suit from EU).
  - The placement may be in conflict with the EU habitat directive.
- The process has been / not been democratic!
  - The secretiveness up to the public announcement on the location seems undemocratic: However, this procedure is not unusual in connection with preparatory law work in Denmark.
  - The chancellery language in the communication from the authorities signal that the Ministries absolute power is too overwhelming.

Conclusion

- The closed process is problematic because the subsequent debate becomes very difficult.
- The concerned citizens and organizations are incapacitated (disempowerment), which means that the ministry's arguments about the necessity of location will not be recognized, and the inadequate environmental impact assessment report only makes it worse.
- The chancellery language and the closed process add fuel to the conflict escalating stories of manipulation and arrogance of power.

Recomendations

- The authorities need to empower NGO's and in particular landowners through dialogue and inclusion,
- Unpopular decisions should follow a conditionally open strategy since there is evidence that this can elicit sufficient cooperation without becoming vulnerable to excessive claiming.
- Work on the communication culture in order to establish a better relation between the partners. Conflict quickly escalates due to the authorities' use of a clumsy and passive chancellery language.
- Ensure legitimacy in the preparatory law work by involving the available expert knowledge.
- Its it not the number of opponents but their access to power and their ability to apply it.

Planede research

- Map the obstacles in the planning processes of implementing wind power.
- Investigate whether a participatory design of decision-making processes and choice of policy tools (legal instruments, incentive mechanisms etc.) can make a better consistency between general societal needs and individual actors particular interests.
- Investigate how project management can include the local community.
- Investigate whether inclusion of local business and industry community can ameliorate wind power projects.

Learning from Wind?

Insights for other Renewable Technologies

IEA R&D Wind Task 11 - Topical Expert Meeting On
Social Acceptance of Wind Energy Projects
Biel, Switzerland, 14 – 16 June, 2012

Geraint Ellis, Queen's University Belfast
Joe Szarka, Bath University
Richard Cowell, Cardiff University
Peter A. Strachan, Robert Gordon University
Charles Warren, St. Andrews University

Queen's University Belfast

Contact: g.ellis@qub.ac.uk

Overview

- The "laboratory" of wind power
- Social acceptance – evolution of an idea
- Insights from wind
- Lessons for the new" renewables
- Limits to transferability

Queen's University Belfast

The "laboratory" of wind power

- Wind as a "pioneer" renewable;
  - Economically viable and large scale
- Mass deployment in response to climate change and energy security;
  - Green-on-Green, ecological modernisation
- Confronting the shift to decentralised power generation – and its siting implications;
- Deployment barriers primarily institutional and social;
- Deployment is path-finding & experimental.

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Social acceptance: evolution of an idea

- Conceptual Framework developed in the context of LULUs: nuclear waste, landfill sites and wind.
- Property rights, class, justice issues
- Successful adoption of any new technology involves:
  - Technological innovation;
  - Economic viability;
  - … and *social interaction*.

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What do we know about social acceptance?

- The Wustenhagen et al model of acceptance:
  - Socio-political; market and community;
- Protagonists use "hard" and "soft" tactics with little evaluation.
- Not a perfect conceptual model
- "Acceptance" suggests free will and can be contested.

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Seven insights from wind power

1. There is no such thing as NIMBY;
2. We need to understand the dispute, not just the objectors;
3. The social construction of impacts;
4. Acceptance is dynamic;

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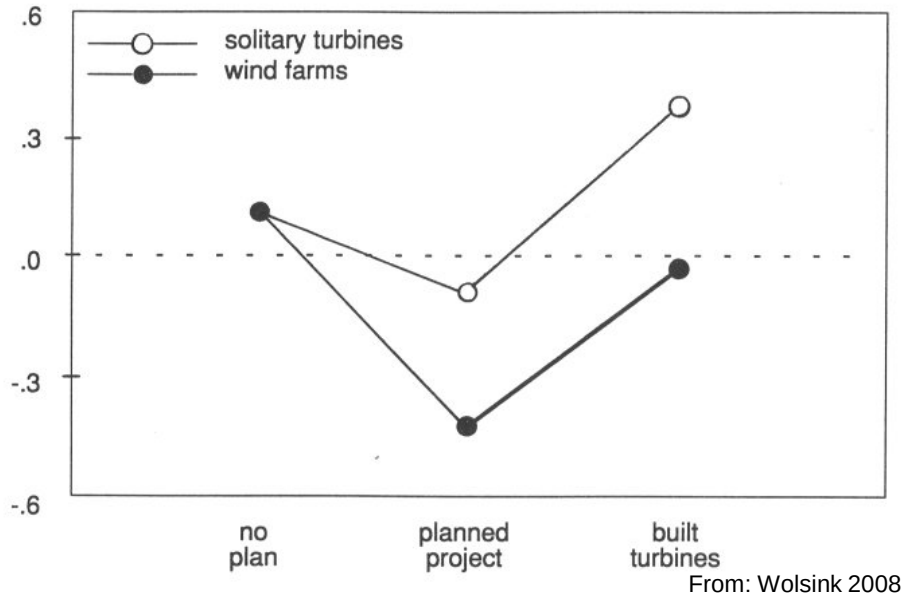
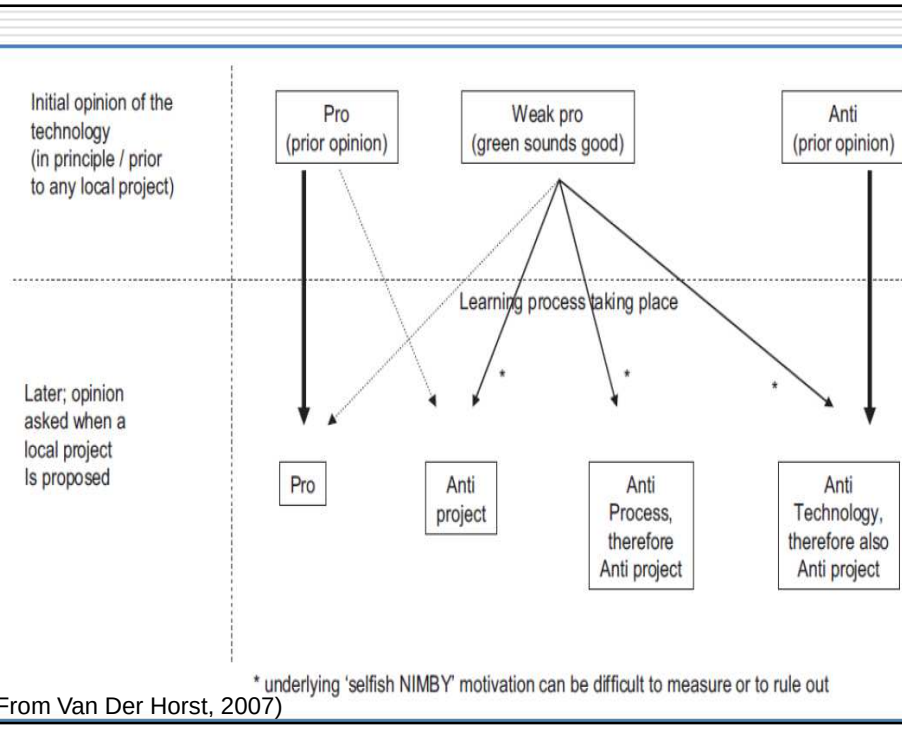
'Truth' 6: Acceptance is dynamic



From: Wolsink 2008



(From Van Der Horst, 2007)

7 insights from wind power

5. The role of fairness, trust and intermediaries;
6. Planning can be the potential solution, not just a problem;
7. The complexity and interaction of influencing factors.

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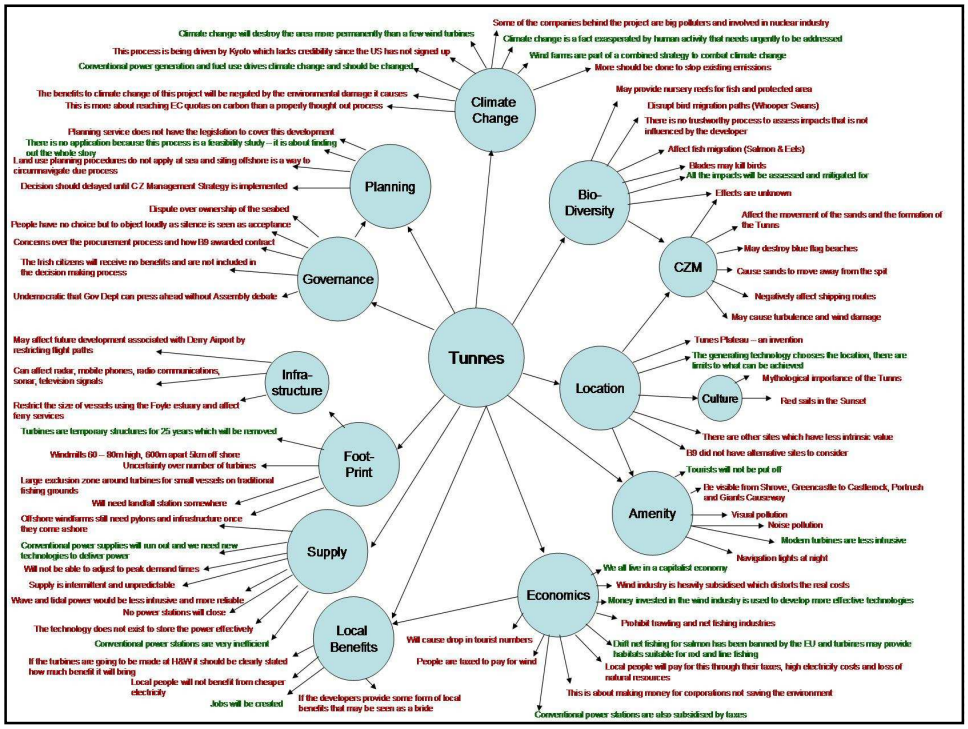

The "new" renewables

- New renewables = "non-hydro".
- Includes:
  - Wind (onshore, marine)
  - Tidal
  - Wave
  - Biomass
  - Solar
- All will increase in scale and become an essential part of the energy mix

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Limits to transferability

- Some issues will be unique to wind:
  - e.g. landscape and upland locations
- Specific technologies will have specific impacts and be perceived differently (e.g. AD);
- Benefits will be variable;
- Some core principles may be shared.

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Transferable lessons:
Adoption of new forms of energy sourcing is socially mediated

- Technology is only realised once translated into its social context;
- RETs are changing the social relationship with energy;
- RETs demand an increased level of social engagement;
- The need for deliberative processes;

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Transferable lessons:
A nuanced understanding of social acceptance

- Objection cannot be wished away;
- Ignorance does not explain objection;
- Regulatory rationality is contested;
- Market share may depend on degree of community acceptance;
- Non-engagement is counter-productive in the long term;
- Acceptance as a deployment strategy.

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Transferable lessons: Industrial structure and ownership profile influence acceptance

- The dynamic between corporate dominance and societal engagement is a powerful factor in energy transition;
- Regulators and developers can promote inacceptance;
- Targets demand multi-national actors;
- Decentralised nature demands community benefits.

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Closing remarks

- Renewables as a social project, not just 'infrastructure'.
- Could we have anticipated the challenge of social acceptance?
- The benefits of cross-sectoral and trans-national policy learning and best practice.

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Place Attachment and Procedural Justice

Dipl.-Psych. Jan Hildebrand
Forschungsgruppe Umweltpsychologie (FG-UPSY)

Universität des Saarlandes
Otto-von-Guericke-Universität Magdeburg
jan.hildebrand@fg-upsy.com

Biel, 15.06.2012

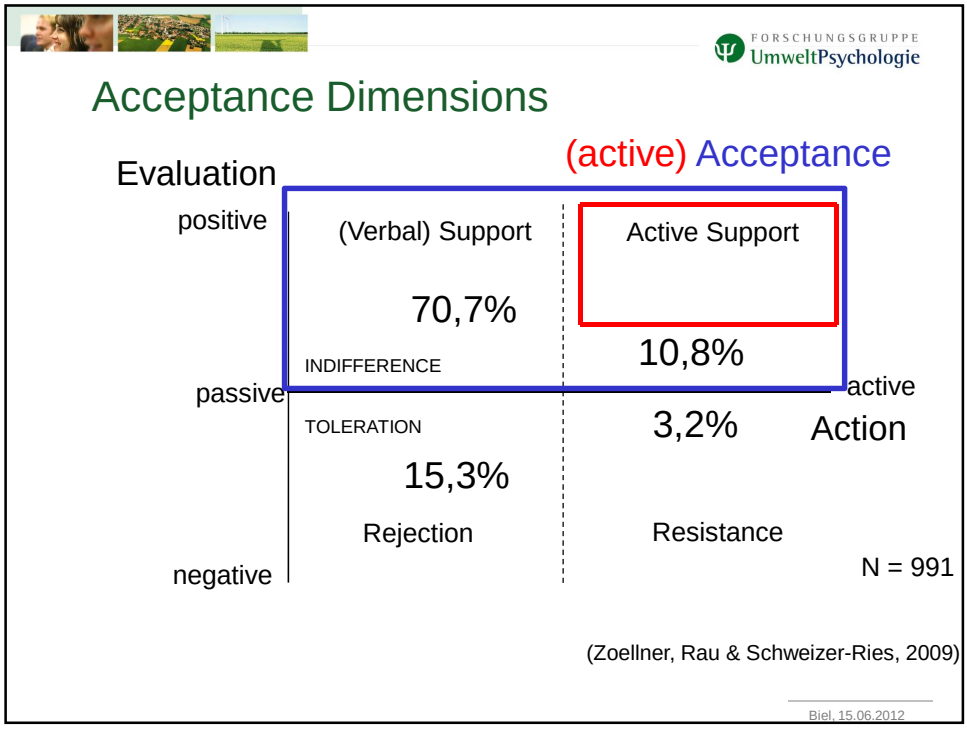
FORSCHUNGSGRUPPE UmweltPsychologie

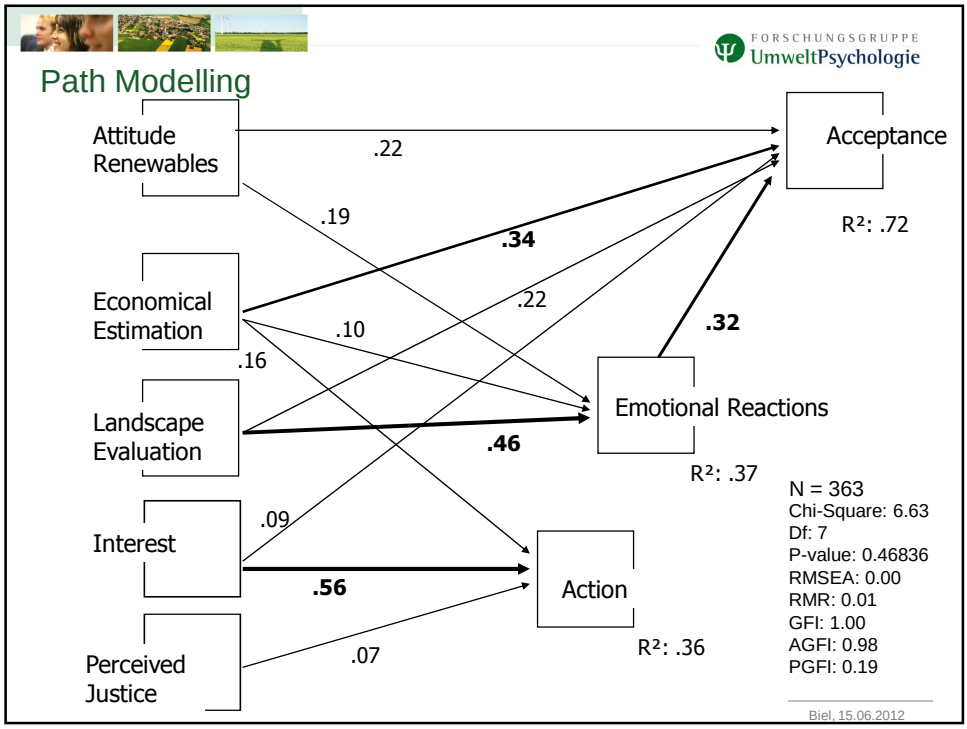
Installation of Wind Turbines

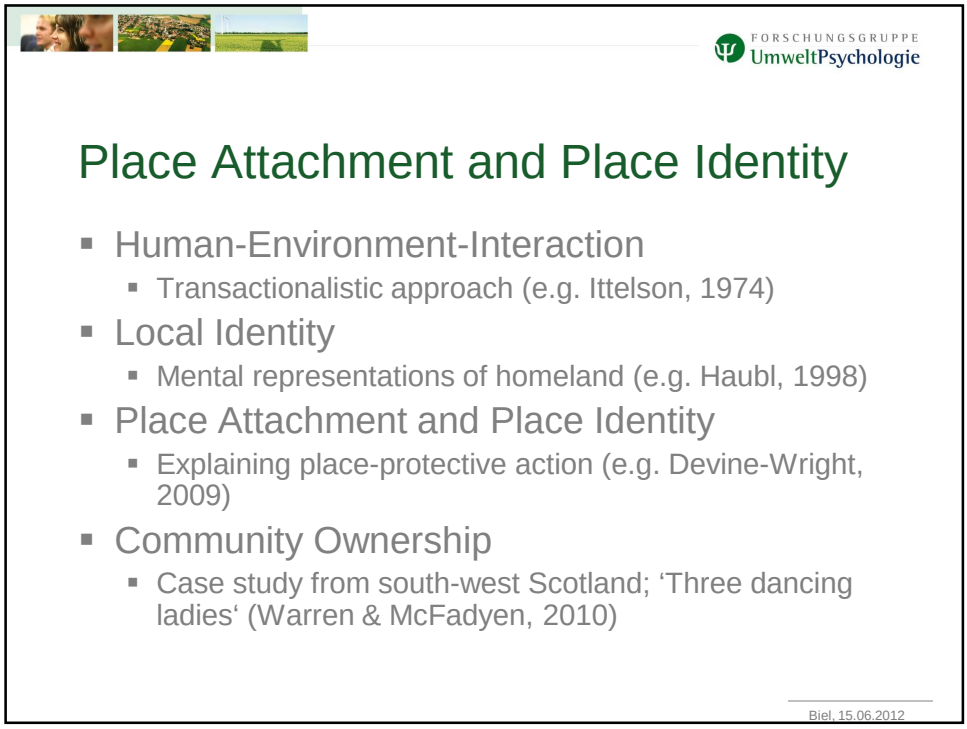
- Changes in the familiar living environment
  - Very sensitive area

- Need for control about changes, which means
  - Knowledge about potential changes
  - Opportunities to influence these changes

Biel, 15.06.2012

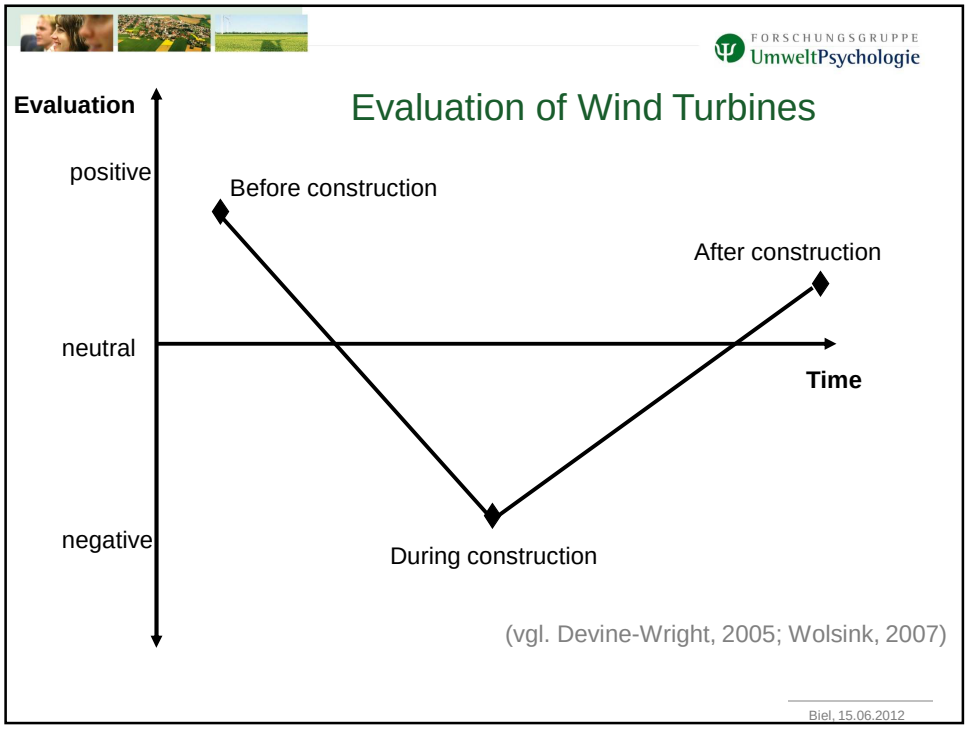

FORSCHUNGSGRUPPE
UmweltPsychologie
Acceptance Dimensions
(active) Acceptance
Evaluation
positive
passive
negative
(Verbal) Support
70,7%
INDIFFERENCE
TOLERATION
15,3%
Rejection
Active Support
10,8%
3,2%
Resistance
active
Action
N = 991
(Zoellner, Rau & Schweizer-Ries, 2009)
Biel, 15.06.2012


FORSCHUNGSGRUPPE
UmweltPsychologie
Path Modelling
Attitude Renewables
Economical Estimation
Landscape Evaluation
Interest
Perceived Justice
Acceptance
R²: .72
Emotional Reactions
R²: .37
Action
R²: .36
.22
.19
.34
.22
.10
.16
.32
.46
.09
.56
.07
N = 363
Chi-Square: 6.63
Df: 7
P-value: 0.46836
RMSEA: 0.00
RMR: 0.01
GFI: 1.00
AGFI: 0.98
PGFI: 0.19
Biel, 15.06.2012

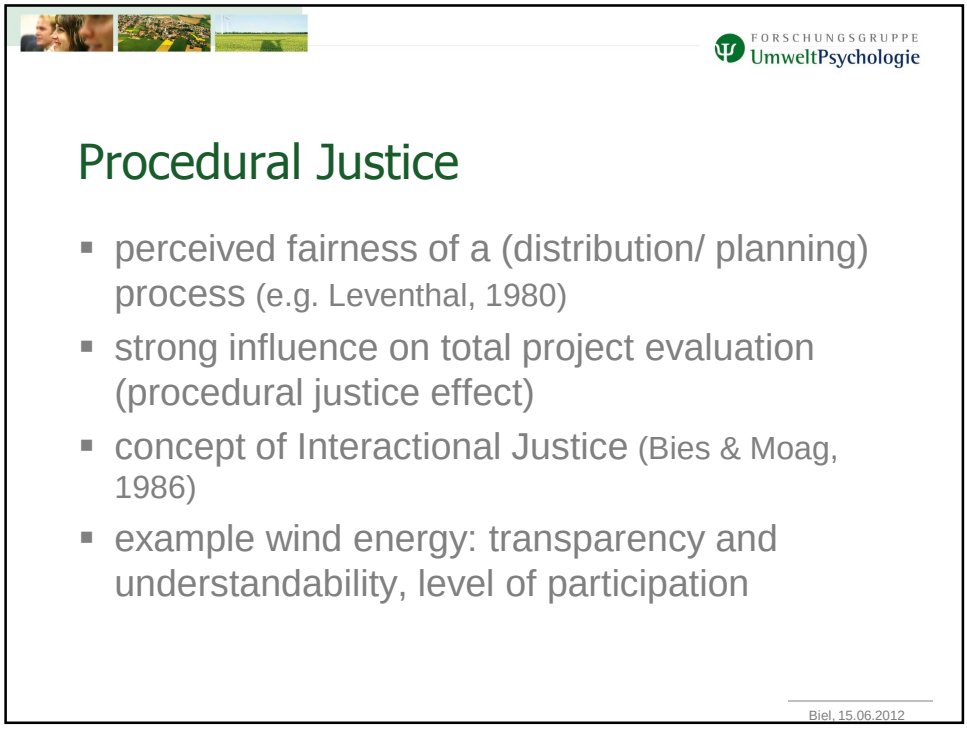

FORSCHUNGSGRUPPE
UmweltPsychologie
Place Attachment and Place Identity
Human-Environment-Interaction
Transactionalistic approach (e.g. Ittelson, 1974)
Local Identity
Mental representations of homeland (e.g. Haubl, 1998)
Place Attachment and Place Identity
Explaining place-protective action (e.g. Devine-Wright, 2009)
Community Ownership
Case study from south-west Scotland; 'Three dancing ladies' (Warren & McFadyen, 2010)
Biel, 15.06.2012

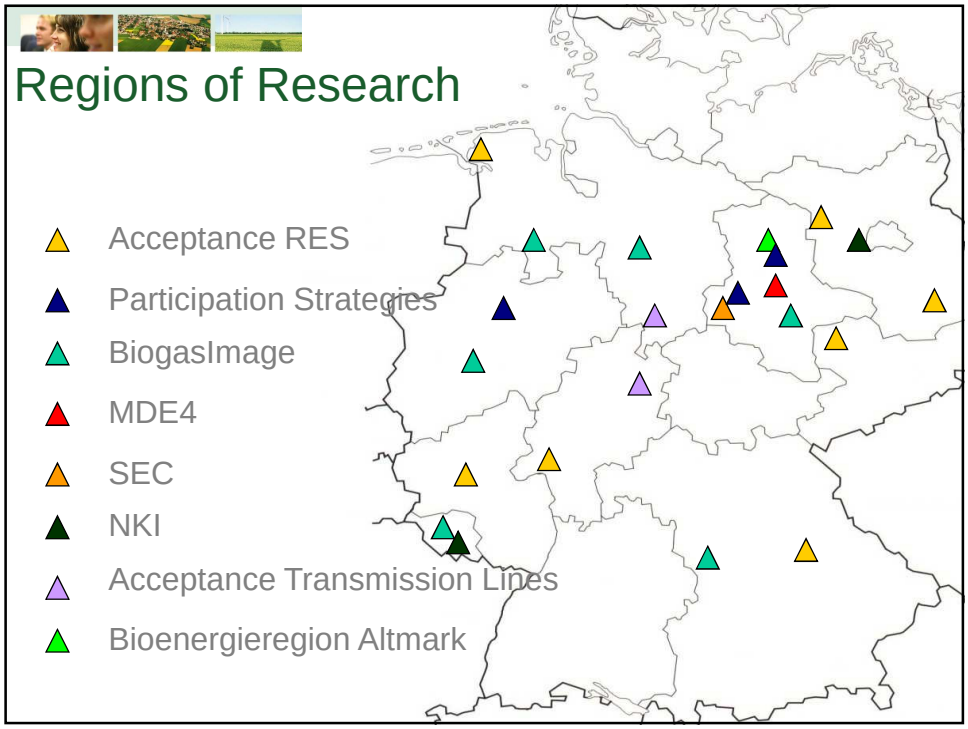

FORSCHUNGSGRUPPE
UmweltPsychologie
Local Identity
Krummhörn Greetsiel
Bürgerinfo
Historische Windmühlen
Seit Jahrhunderten nutzen die Ostfriesen den Wind. Historische Mühlen prägen das Gesicht der Ferienregion Krummhörn. Sie sind Symbole für die Region.
Moderne Windenergieanlagen
Seit Jahrhunderten nutzen die Ostfriesen den Wind. Historische Mühlen prägen das Gesicht der Krummhörn. Sie sind Symbole für die Region, wie die Leuchttürme oder die wuchtigen Bauernhöfe aus rotem Backstein. Aber auch ihre modernen Nachfolger, moderne Windenergieanlagen zur Stromproduktion, prägen das Landschaftsbild. Alt und Neu stehen hier einträchtig nebeneinander. 1989 ist von der Firma EWE am Rande des Warfendorfes Pilsum der einst größte Windpark Deutschlands mit 10 Windrädern eröffnet worden. Heute gibt es größere Windparks, wie z.B. der zur Zeit größte Windpark Europas in der Nähe von Emden: Wybelsumer Polder. Ostfriesland ist in seiner Stromversorgung mit den existierenden Windparks völlig autark und leistet hierdurch u.a. einen wichtigen ökologischen Beitrag zum Klimaschutz.

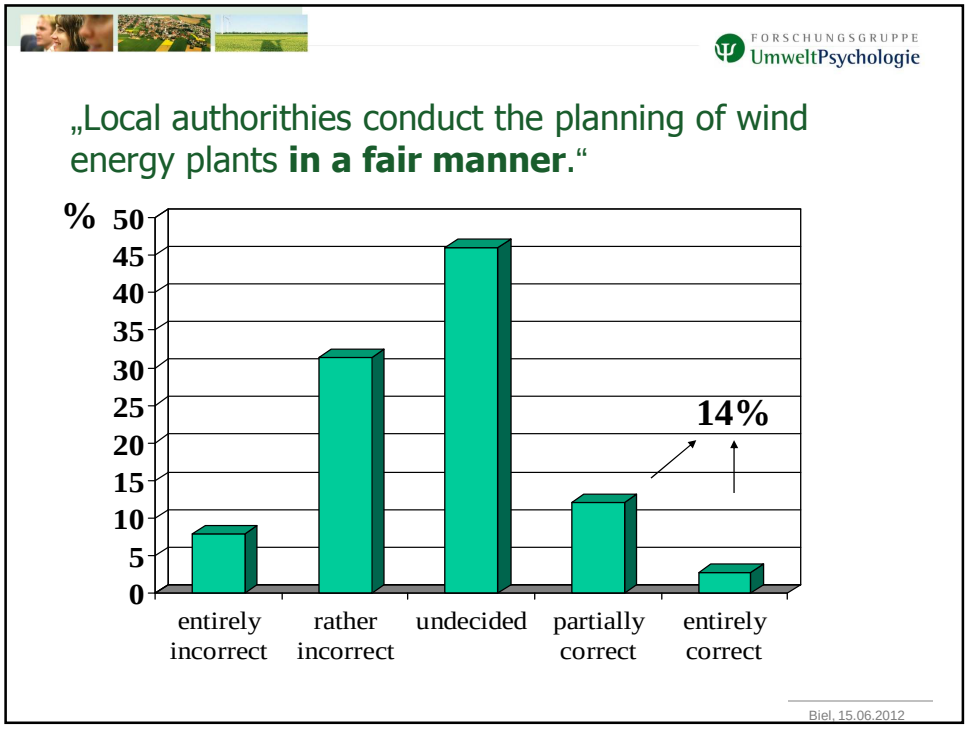

FORSCHUNGSGRUPPE
UmweltPsychologie
Integration of new technologies in social context
(Pictures: Energiepark-Druiberg)
Biel, 15.06.2012

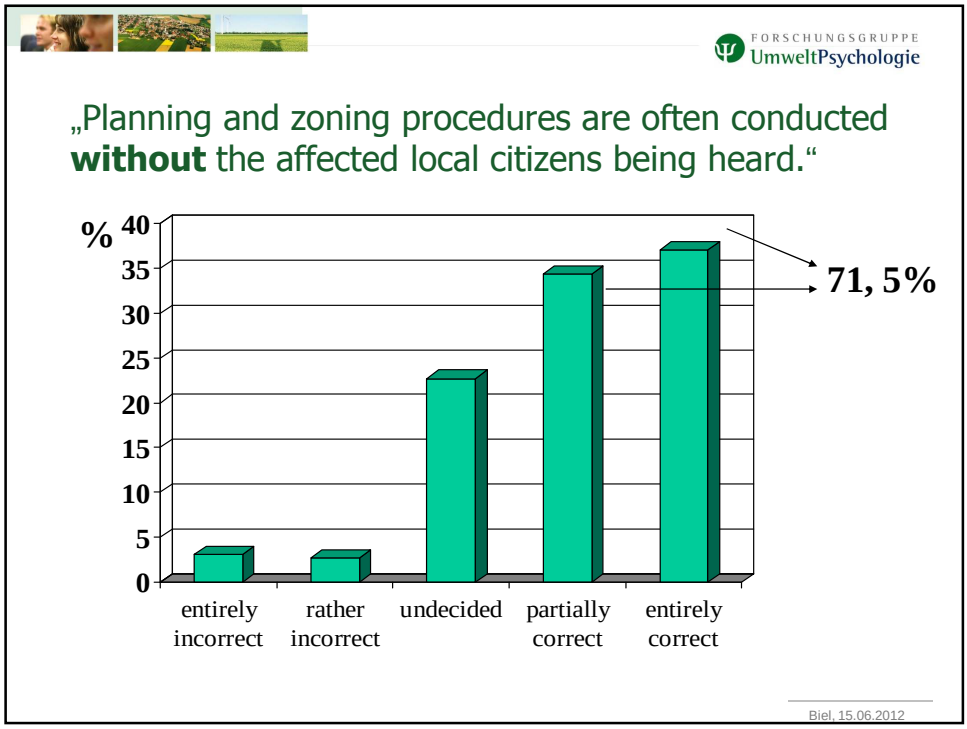

FORSCHUNGSGRUPPE
UmweltPsychologie
Evaluation of Wind Turbines
Evaluation
positive
neutral
negative
Before construction
During construction
After construction
Time
(vgl. Devine-Wright, 2005; Wolsink, 2007)
Biel, 15.06.2012

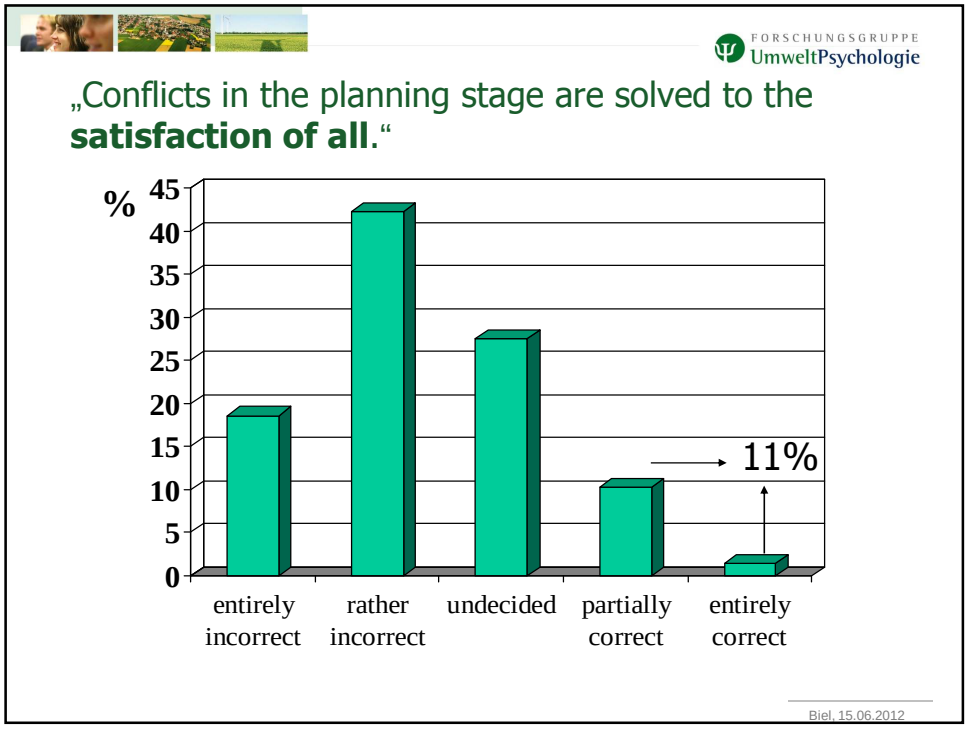

FORSCHUNGSGRUPPE
UmweltPsychologie
Time and Education
Biel, 15.06.2012

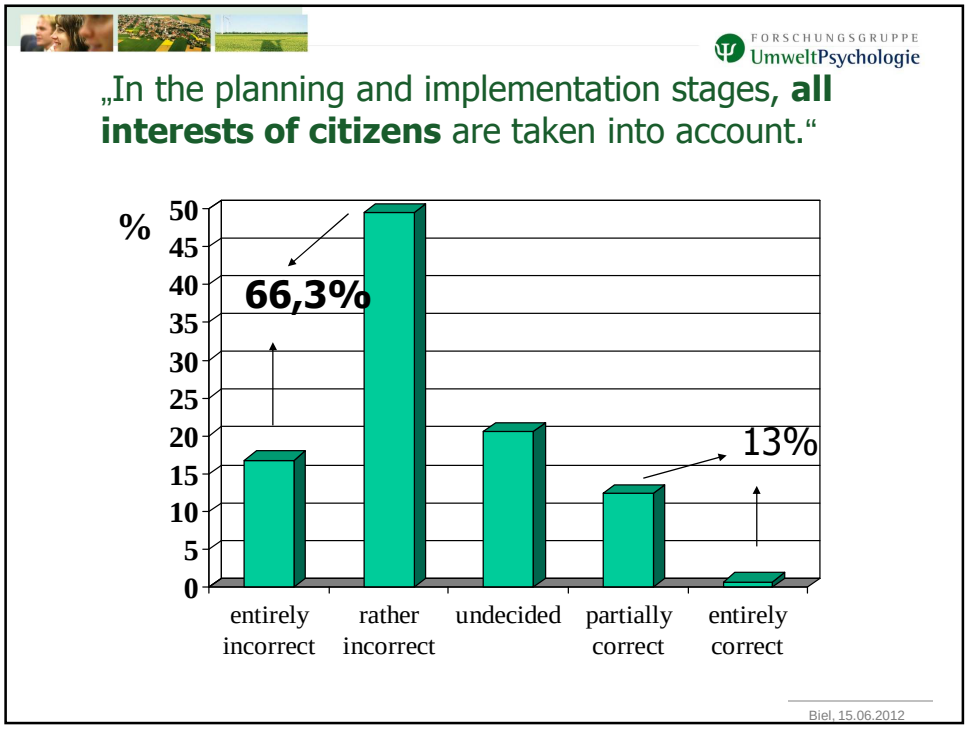

FORSCHUNGSGRUPPE
UmweltPsychologie
Procedural Justice
perceived fairness of a (distribution/ planning) process (e.g. Leventhal, 1980)
strong influence on total project evaluation (procedural justice effect)
concept of Interactional Justice (Bies & Moag, 1986)
example wind energy: transparency and understandability, level of participation
Biel, 15.06.2012

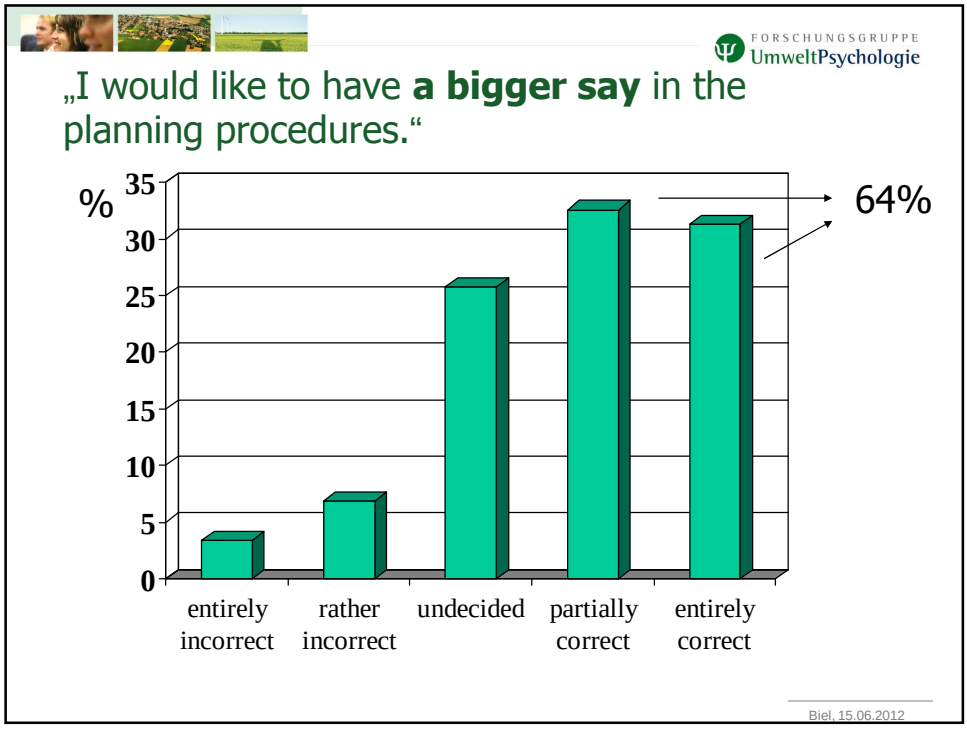

Regions of Research
Acceptance RES
Participation Strategies
BiogasImage
MDE4
SEC
NKI
Acceptance Transmission Lines
Bioenergieregion Altmark

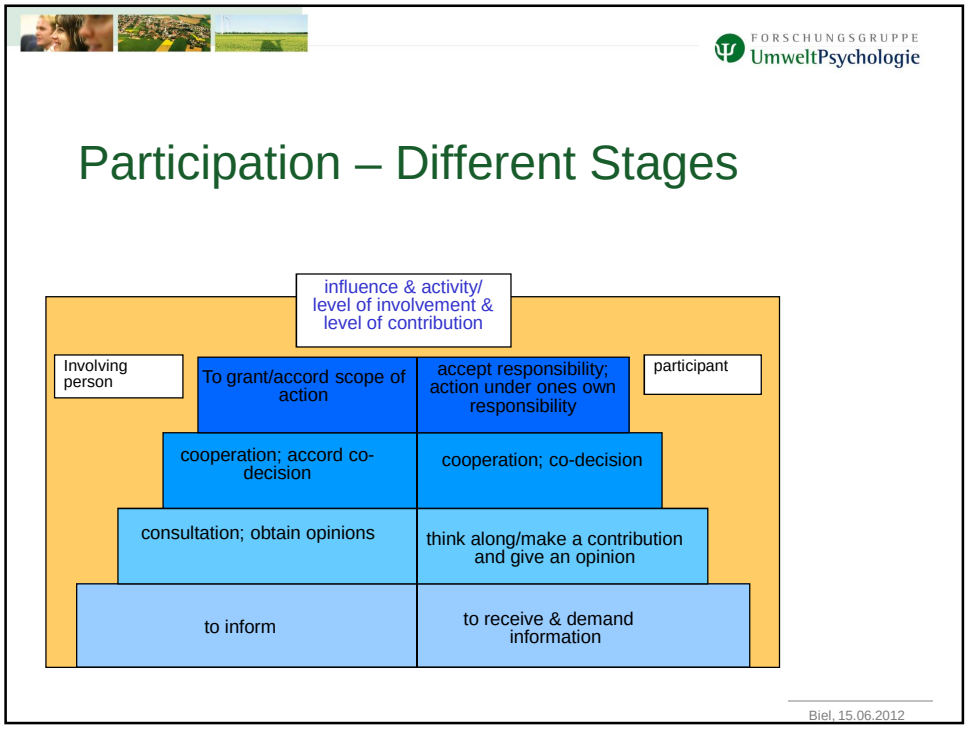

FORSCHUNGSGRUPPE
UmweltPsychologie
„Local authorithies conduct the planning of wind energy plants **in a fair manner**.“
%
50
45
40
35
30
25
20
15
10
5
0
14%
entirely incorrect
rather incorrect
undecided
partially correct
entirely correct
Biel, 15.06.2012

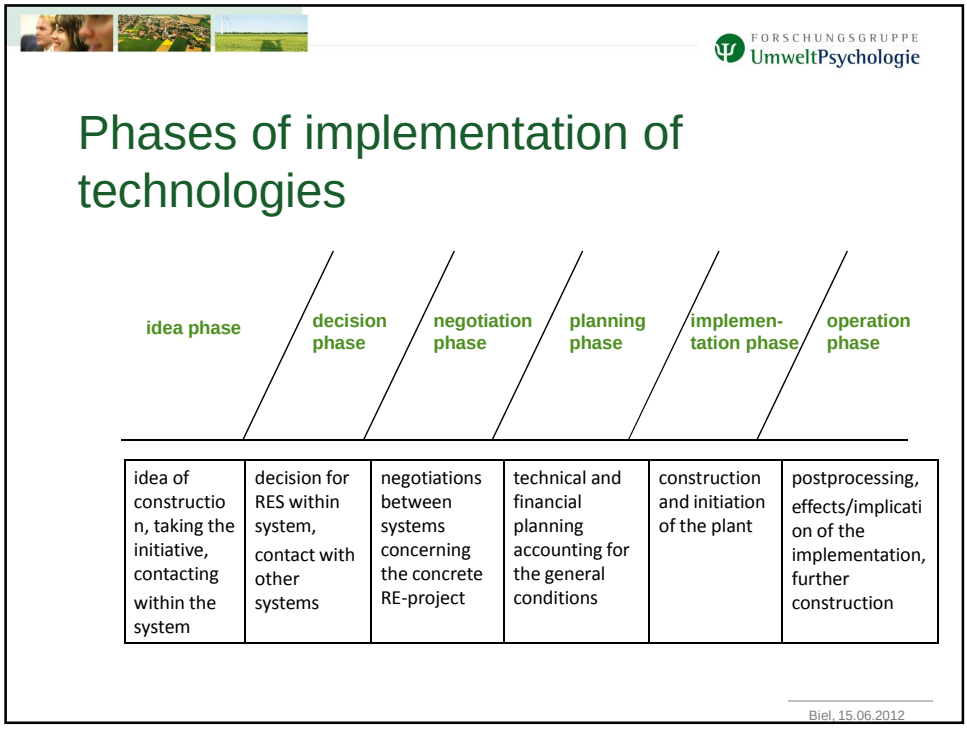

FORSCHUNGSGRUPPE
UmweltPsychologie
„Planning and zoning procedures are often conducted **without** the affected local citizens being heard.“
%
40
35
30
25
20
15
10
5
0
71, 5%
entirely incorrect
rather incorrect
undecided
partially correct
entirely correct
Biel, 15.06.2012


FORSCHUNGSGRUPPE
UmweltPsychologie
„Conflicts in the planning stage are solved to the satisfaction of all.“
%
45
40
35
30
25
20
15
10
5
0
11%
entirely incorrect
rather incorrect
undecided
partially correct
entirely correct
Biel, 15.06.2012


FORSCHUNGSGRUPPE
UmweltPsychologie
„In the planning and implementation stages, all interests of citizens are taken into account.“
%
50
45
40
35
30
25
20
15
10
5
0
66,3%
13%
entirely incorrect
rather incorrect
undecided
partially correct
entirely correct
Biel, 15.06.2012


FORSCHUNGSGRUPPE
UmweltPsychologie
„I would like to have **a bigger say** in the planning procedures.“
%
35
30
25
20
15
10
5
0
64%
entirely incorrect
rather incorrect
undecided
partially correct
entirely correct
Biel, 15.06.2012


FORSCHUNGSGRUPPE
UmweltPsychologie
Participation – Different Stages
influence & activity/ level of involvement & level of contribution
Involving person
participant
To grant/accord scope of action
accept responsibility; action under ones own responsibility
cooperation; accord co-decision
cooperation; co-decision
consultation; obtain opinions
think along/make a contribution and give an opinion
to inform
to receive & demand information
Biel, 15.06.2012


FORSCHUNGSGRUPPE
UmweltPsychologie
Phases of implementation of technologies
idea phase
decision phase
negotiation phase
planning phase
implemen-tation phase
operation phase
idea of constructio n, taking the initiative, contacting within the system
decision for RES within system, contact with other systems
negotiations between systems concerning the concrete RE-project
technical and financial planning accounting for the general conditions
construction and initiation of the plant
postprocessing, effects/implicati on of the implementation, further construction
Biel, 15.06.2012


PM
Auf einen Blick
Andere können zum Klimaschutz in Kleinmachnow
Ich kann zum Klimaschutz in Kleinmachnow
Welche Maßnahmen gefallen Ihnen am

FORSCHUNGSGRUPPE UmweltPsychologie

Conclusions

- Potential of place attachment and procedural justice for positive development on RES
- Emphasising of regarding the social framework in which wind energy is embedded
- Regional solutions should be reached in addition to centralised approaches

Biel, 15.06.2012

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Thank you for listening!

Biel, 15.06.2012


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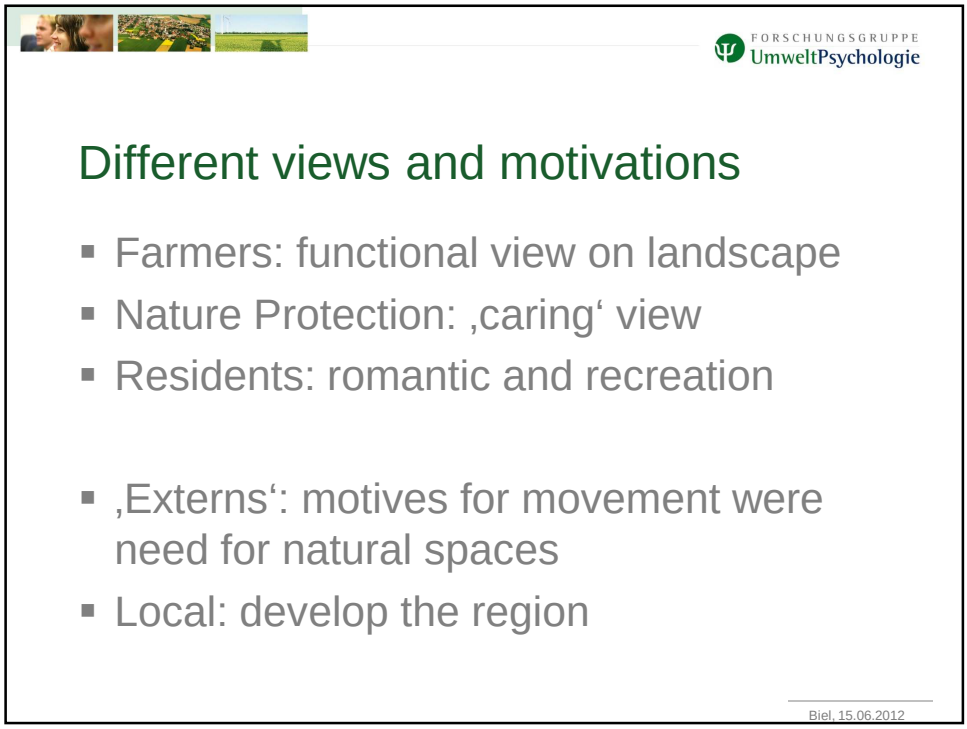
FORSCHUNGSGRUPPE
UmweltPsychologie
Different views and motivations
Farmers: functional view on landscape
Nature Protection: ‚caring' view
Residents: romantic and recreation
‚Externs': motives for movement were need for natural spaces
Local: develop the region
Biel, 15.06.2012