GP WIND – DELIVERABLE D3.5
COMPOSITE CASE STUDY REPORT

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WP3 Composite Case Study Report

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Introduction – background to the report

This report summarises the content of the 16 Thematic Case Studies (TCS) prepared for Work Package 3 of the Good Practice Wind (GP WIND) Project. It identifies common issues and key findings, and summarises conclusions as determined by discussion at the International Stakeholders Meeting in Brussels on 25th October 2011. This report, in conjunction with the full Thematic Case Studies report, is intended to inform the development of the Good Practice Guide and Toolkit in Work Package 4.

Thematic case studies summaries

Consultations with stakeholders in autumn of 2010 and spring of 2011 identified a strong wish for the case studies in the GP WIND programme, originally envisaged to be organized as examinations of the process of a number of actual wind energy developments, to instead take a thematic approach. This change was formally adopted at the Steering Group meeting in Rome on 4 and 5 March 2011.

The Thematic Case Studies adopted at the meeting were as follows:

1. Species impact onshore and offshore
2. Impact on habitats
3. Biodiversity
4. Cumulative Impact
5. Systems and process for monitoring impacts; Examples of environmental mitigation techniques
6. Carbon Accounting issues
7. Construction and operation of facilities in the marine environment
8. Offshore -human commercial activities: fisheries, marine industries, seabed issues, landfall sites
9. Communication, awareness, information cascades
10. Landscape & Managing visual impact issues (Visualisation techniques/Mitigation actions)
11. Noise Issues – including underwater
12. Conflicts with other economic interests including tourism
13. Community concerns and acceptance – how to achieve ‘buy in’
14. Community benefit schemes (including community ownership)
15. Dealing with complex or entrenched public perception issues
16. Undertaking Socio-Economic Analysis for developers
Responsibility for each TCS was assigned to a lead partner in the project team, with a deadline for the initial draft at the end of May 2011. These were internally peer-reviewed in June-July of 2011, and draft versions circulated to stakeholders in August 2011. In September, regional stakeholder’s meetings took place and feedback from these and from written submissions were evaluated and as appropriate incorporated in early October 2011. Further contributions made at the International Stakeholders Meeting on 25th October 2011 were incorporated after the meeting.

**TCS1: Species impact onshore and offshore**

**Key issues identified**

- Mortality of birds and bats, especially rare/slow reproducing species, by impact with turbines or turbine blades (occasionally by turbulence caused by turbines)

- Modifying habitat making it less (or more) suitable for certain species. Especially (but not only) offshore, as turbine bases form ‘artificial reefs’ and can cause scour of sea floor by altering currents

- Avoidance of wind turbine areas by certain species

**Examples of good practice/lessons learned**

- Indicative advice/spatial planning guidance at regional/national level

- Clear and good quality EIA standards

- Use of mitigation hierarchy (attempt to avoid impact; if not possible minimize; if not possible compensate (not in the money sense), e.g. by providing habitat restoration elsewhere for ‘no net loss’)

- Micrositing. Small adjustments to siting of turbines can in some circumstances reduce e.g. mortality of birds considerably

- Habitat management: managing the habitat so that certain vulnerable species do not find the wind farm area unusually attractive

**Implications for policy and practice**

- Attention to potential species impacts, preferably on a regional/national scale before formal planning process is begun (‘scoping phase’)

- Clear indicative planning guidelines to developers

- EIA requirements which are clear, transparent, and credible

- Mitigation schemes need to be species specific, as generalisation between even apparently similar species is often misleading, and monitored using the BACI (Before-After Control-Impact) approach
TCS2: Impact on habitats

Key issues identified

- Barrier effects on migration
- Habitat loss or degradation caused by changes to vegetation, hydrology, human activity (typically increased accessibility), etc.

Examples of good practice/ lessons learned

- Combination of measures at Pian dei Corsi wind farm, Italy
- Extensive Scottish work on windfarm and peatland good practice guidance
- Scottish sectoral marine plan for offshore wind - Habitats Regulations Appraisal

Implications for policy and practice

- Early consideration of possible habitat impacts prior to formal planning process EIA
- Provision of advice at government level on habitat issues in relation to wind power
- Local stakeholder consultation/ involvement in any habitat restoration necessary

TCS3: Biodiversity

Key issues identified

- Habitat loss/degradation
- Mortality from impacts, traffic on access roads, etc.
- Reduction in breeding success through habitat degradation, increased disturbance, etc.

Examples of good practice/ lessons learned

- International Union for Conservation of Nature (IUCN) document on ‘Greening Blue Energy: identifying and managing biodiversity risks and opportunities of offshore renewable energy”
- Online biodiversity tracking tool “Bio3” and online “Wildlife fatality estimator” for human infrastructures
- Locational guidance on the issue by e.g. Scottish Natural Heritage, Danish Energy Authority

Implications for policy and practice

- Early consideration of possible biodiversity impacts prior to formal planning process EIA
- Strategic locational approach to issue at regional/national level
- Knowledge base often inadequate and needs attention at governmental level in order to give clear information and guidance to stakeholders
TCS4: Tackling Cumulative impact issues

Key issues identified

- CI complex, can be hard to assess and does not fall naturally within ‘single site’ EIA requirements or of consenting systems for other types of land use which can affect windfarm CI
- Transboundary issues can be a problem for assessment (regional, international)
- Small scale developments in some jurisdictions do not require EIA but can contribute to CI
- There is a particular need for a better knowledge base of CI for offshore wind farms

Examples of good practice/ lessons learned

- Clear guidance on scoping procedures including planning advice notes
- Engagement with stakeholders early in planning process (before formal application)
- Engagement on issue of authorities at local and national level
- Large scale spatial planning assist process by identifying areas where windfarms are likely to experience few CI problems, and those where the risk is higher

Implications for policy and practice

- Strategic spatial planning, integrated with rest of planning system
- Consistent, robust methodology and guidance for CI assessment
- Early and effective engagement between developers, government, communities, other stakeholders
- EU scale Code of Good Practice on CI
- CI of the development should be required to be considered in EIA
- Consenting body should have power to refuse consent where CI deemed unacceptable
- Robust data collection (BACI) to improve knowledge base regarding CI

TCS5: Systems and process for monitoring impacts; examples of environmental mitigation techniques

Key issues identified

- EIA requirements need to be clear, transparent, credible; they frequently are not
- Consenting conditions should require good quality monitoring of potential impacts of concern
- Knowledge base requires attention; consent can be refused on ‘precautionary principle’
Examples of good practice/ lessons learned

- BACI approach to monitoring impacts is accepted good practice standard, but so far infrequently carried through in full, especially pre-development baseline studies
- Though not strictly concerned with impact monitoring, the approach in Scotland dealing with radar issues is instructive. The problem was common to very many proposed developments and the government initiated a process with relevant stakeholders to find a technical solution, which involved construction of a new radar.
- The developments at Mount Panachaikos (Greece) have been controversial and suffered from a lack of pre-studies on likely impacts. Post-construction monitoring has now been instituted, but the case indicates why thorough pre-construction assessment of likely impacts is necessary

Implications for policy and practice

- In cases common to many wind farm applications, a common large scale investigation of the issue and its resolution/mitigation may be preferable to numerous partial studies in specific-site EIAs. This does not remove the need to consider the issue in EIAs, but increases the knowledge base with which to address concerns.
- The BACI approach to monitoring impacts should be generally adopted except where there are convincing specific grounds to conclude that it is not possible or desirable.

TCS6: Carbon accounting for wind farms

Key issues identified

- Carbon accounting is important for environmental reasons, is increasingly legislatively required, impacts the consenting process in many jurisdictions, and can have financial implications
- Carbon accounting is a complex task and needs to include construction, operation, and decommissioning phase emissions, direct and indirect.

Examples of good practice/ lessons learned

- Detailed guidance on and methodologies for assessing carbon emissions from wind farms, e.g. Scotland
- Detailed guidance on best practice in windfarm construction, including minimizing carbon emissions in the process

Implications for policy and practice

- Important to obtain clarity about the sources of emissions during a wind farm's life cycle.
- Methodological development is required in this respect
- Methodologies and practices need to be transparent and credible
TCS7: Construction and operation of facilities in the marine environment

Key issues identified

- Underwater noise, in particular its effect on marine mammals and fish
- Scour, i.e. the creation of currents, especially around turbine bases, which lead to erosion of the sea floor in some places and deposition of sediment in others, thus altering habitats.
- Potential effects on seabirds and migratory land birds (collision, habitat alteration, attraction to safety/navigation lighting). These issues are dealt with in TCSs 1-4.

Examples of good practice/lessons learned

- Precautionary timeline restrictions limiting or halting certain activities, such as pile driving, at times when animals may be particularly sensitive to disturbance
- Clear and focused consultations with regulators and key stakeholders
- Mitigation of, for example, sound impacts through deterrent sounds before activity, or ‘soft starts’ with gradually increasing intensities, intended to move animals away from the impact area in a more gradual manner.
- Cumulative impacts, from other wind farm activities and other marine industries, need to be taken into account
- Obtaining good local data, e.g. on local spawning timing of a given fish species. This can reduce considerably periods of restriction compared to using ‘generic’ values for the spawning period of the species.
- Scour protection analysis along with remedial/mitigation measures incorporated in the EIA
- Monitoring of scour effects

Implications for policy and practice

- Implementation of clear, research driven, generic guidance on all monitoring aspects associated with scour protection before, during and after construction

TCS8: Offshore - human commercial activities: fisheries, marine industries, seabed issues, landfall sites

Key issues identified

- There are a large number of other industries operating offshore. The importance of each varies from area to area.
- Cultural aspects of the use of the sea, especially as regards fishing – often the basis of well-established traditional cultures - can be important
- Landscape issues are often prominent for near-shore developments
Examples of good practice/lessons learned

- Marine spatial planning
- Early and continuing engagement with fisheries and other stakeholders
- Finding synergies with other marine activities and organizations (e.g. aquaculture)
- Comprehensive monitoring programmes build data for the future and build confidence in the existing installation (e.g. Horns Rev and Nysted programmes, Denmark)
- Development of floating foundations. Technically challenging, but avoid many sea bed issues.
- Tourism concerns must also be taken seriously. The sea shore is an important tourist destination in many countries and so particularly sensitive to landscape concerns.

Implications for policy and practice

- Marine planning must include information on fisheries and other commercial activities, and navigation routes
- Stakeholders must be fully involved from the early stages of the project
- Regulatory framework should include siting guidelines and zoning
- Regulatory framework should include measures for avoiding environmental impacts and mitigating visual impacts
- Baseline studies of fishing activities are required
- Information provided to stakeholders must be clear and transparent, with potential impacts clearly highlighted and mitigating measures proposed
- Experience and research should be required to be published (e.g. in consenting conditions) in a form suitable for improving the general knowledge base at a European level

TCS9: Communications, awareness, information cascades

Key issues identified

- Challenges similar across Europe, so advantages from gathering experience
- Information overload and assessing credibility of information a difficulty for stakeholders in the information age
- Trust takes time to build, seconds to destroy and forever to repair. Getting it and keeping it is key to minimising development process delays and the risk of consent refusal.

Examples of good practice/lessons learned

- Governments and consenting authorities should proactively communicate their own renewable energy objectives through clear policies and targets
- The strategies include maps which communicate where wind energy is encouraged, potentially acceptable or unacceptable and incorporate all applicable environmental, social, economic and energy policies and objectives.

- An informal pre-planning consultation which assists project designers in understanding specific local issues.

- Developers of projects should maintain up-to-date and complete websites, social media networks and newsletters about the environmental and economic impacts and benefits of the specific project to the locality (access to the internet should not be assumed).

- Brown field or industrial sites can be easier to communicate positively compared to a grid connected green field site.

- Some wind farms include visitor centres. This may not be a viable option for every project; however an onsite display (and website) which showcases the project may help communicate the benefits attributable to an individual project.

- Promoters of projects must avoid an adversarial approach to engagement. Local stakeholder concerns should not be labelled as NIMBYism (Not In My Back Yard). This is a gross oversimplification, risks time-consuming and expensive dismissal of genuine concerns without proper critical appraisal, and is very likely to alienate a section of the community. It develops a self-reinforcing psychology of a contest with sides, both of which feel they must win.

- An atmosphere - and reality - of constructive engagement is in the interests of all parties. Developers are, for natural reasons, in the forefront of shaping this.

- Engaging in a process which simply tries to convince, rather than consult, has a poor track record of success.

**Implications for policy and practice**

- Communications and awareness are, to a large extent, within the control of project promoters. However they must engage completely with stakeholders, with the support of clearly communicated national policies, regional strategies and independent factual information.

- Government and consenting authorities should communicate a framework for the implementation of policies and targets.

- The project should be set out in comparison to the environmental impacts/benefits/advantages/disadvantages of other options for satisfying local and national energy and security requirements into the future.

- Project promoters must engage in meaningful and real ways with local stakeholders at the earliest possible opportunity.

- Where wind energy has disadvantages these should not be understated in communications. This is an excellent way to destroy trust.
TCS10: Landscape & Managing visual impact issues

Key issues identified

- Landscape and scenery, especially of the place they live, are important to most people. This is why most studies identify the visual impact of wind farms as the single most important single barrier to the deployment of wind technology.

- Amenity is an important aspect of this: sense of convenience, enjoyment, and comfort.

- Cultural heritage is the other leading factor. Landscapes are often part of the historical, cultural and social heritage of a nation, a people or a community. National and local governments throughout Europe have formally designated certain landscapes as part of their cultural heritage, indicating the importance of this factor.

Examples of good practice/ lessons learned

- Visualisation during the planning process – interactive mapping so that individuals can see how the wind farm will look from whichever vantage point they consider important.

- Guidance from authorities on designing and siting windfarms in the landscape

- Early consultation with stakeholders in advance of the formal consultation process

- Landscape concerns should be incorporated as an integral part of the decision-making mix both for where to site wind farms, and the exact siting of turbines within wind farms

Implications for policy and practice

- Landscape character assessment and the integration of wind power within that landscape should be assessed on a regional basis

- Communities hosting wind farms need to be consulted from from the earliest stages of the developer’s planning phase

TCS11: Dealing with noise issues

Key issues identified

- Siting of wind farms in relation to residential and other areas of human activity

- Distance of wind farms from areas of human activity

- Size and type of turbine

- Level of background noise

- Nature of the area in which a wind farm is sited, e.g. urban, rural or maritime

- Monitoring of noise from wind farms during operational phases.

Examples of good practice/ lessons learned

- The UK Parliament has comprehensively examined the issue for England & Wales and developed detailed National Policy Statements including Statements relating to
Renewable Energy Infrastructure. An important conclusion from this work is the need for on-going consultation with wind farm developers, manufacturers and local communities, and for the continual review of standards, methodology and policy on noise thresholds

- In Scotland a Planning Advice Note covers a similar analysis of the issue
- At Estinnes wind farm in Belgium, an unexpected resonance phenomenon in two 7MW turbines caused abnormal levels of noise. The issue was addressed by the operator both through studies and contacts with the local inhabitants. These measures were largely successful in resolving the issue.

**Implications for policy and practice**

- Best possible design and pre-construction assessment to minimise noise problems
- Careful siting with respect to human activities especially residential development
- Stakeholder consultation from the early planning stage onwards
- Continual review of methodology, standards and policy for wind farm design and noise thresholds
- Manufacturers to review continually blade and turbine design to reduce noise
- Continual monitoring of noise levels and ensuring compliance with conditions
- Greater co-ordination of research and policy at an EU level including maritime matters

**TCS12: Conflicts with other economic interests including tourism**

**Key issues identified**

- Tourism is often a significant issue, most often because of concerns for negative effects, but sometimes positively through visitor centres etc.
- Agriculture and animal husbandry
- Electromagnetic interference, including TV reception and radar
- Property prices. Negative effects on property prices are often feared, especially in areas where the scenery is particularly valued

**Examples of good practice/ lessons learned**

- Including wind farms as positive tourist attractions in the marketing of tourism
- Early engagement with farmers on animal husbandry concerns
- Incorporating wind energy in spatial planning systems
- Design modifications to reduce potential for electromagnetic interference
- Refusal of consent at some locations for economic conflict reasons has resulted in more thorough scoping of subsequent development plans
Implications for policy and practice

- Spatial planning to integrate varying economic interests
- Early stakeholder involvement in wind farm development proposals
- Authorities and developers should give special attention to the socioeconomic studies included in the EIA processes

TCS13: Conflicts with other economic interests including tourism

Key issues identified

- Broad communication of the case for wind power, without ignoring or trivialising the compromises which can be involved with other interests/objectives
- Large diffusion of local information
- Early project focused communication between developers and the local community on the wind farm project to create dialogue and trust
- Fair and transparent decision making process providing all stakeholders with the opportunity to participate;
- Local financing and equitable profit sharing through fair benefit scheme mechanisms
- Consistent and robust spatial planning

Examples of good practice/lessons learned

- Strict rules and frameworks for the planning and decision making process which are equitable and transparent: a clear and fair process which is seen to be clear and fair.
- Zoning system for offshore development, e.g. Belgium, Denmark
- Broad public communication on wind power issues generally
- Local information on local proposals from the earliest stage and during operation
- A regular and real dialogue with the local community and municipality from the early stages of the project
- Distributing revenues from wind energy in an equitable way helps to improve support from the local community

Implications for policy and practice

- Broad communication on wind energy issues generally, as well as specific dialogue from the outset of a specific proposal at the local level
- Citizens’ buy-in is conditioned to a large extent by the destination of the financial revenues from wind farms
TCS14: Community benefit schemes

Key issues identified

- Community Funds: Receiving a lump sum or regular payments into some manner of fund for the benefit of local residents

- Benefits in Kind: Where the developer directly provides or pays for local community facility improvements, environmental improvements, visitor facilities, school and educational support, etc

- Local Ownership: Opportunity to purchase shares in the project either through their own investment or through a profit-sharing or part-ownership scheme designed to tie community benefits directly to the project performance and revenues.

- Local Employment: Contracting and associated local employment opportunities during construction and operation.

- The investigation of appropriate ways to offer, manage and secure benefits for local communities, especially where there is no relevant legislation

- The establishment of liaisons among implicated stakeholders under the principles of transparency, information, citizen involvement and innovative thinking

- The proactive involvement of local communities in wind power generation projects

Examples of good practice/ lessons learned

- Community benefit schemes at Anavra, Magnesia, Mount Rodopi in Greece. Founded on early engagement with community by developers. 3% of gross income is redistributed to the community by various mechanisms.

- Community schemes in Belgium incorporating shares held by children in the community; and public-private partnerships with the local community as public partner

- Mount Panachaikos, Greece. The community scheme has failed to provide expected benefits, for reasons disputed between developer and local community. This illustrates the need to carefully structure such efforts

Implications for policy and practice

- An appropriate legal framework for the design and implementation of community benefit schemes is highly desirable

- Developers and operators should actively collaborate with stakeholders, from early in the process

- Local authorities should arrange impartial informational facilities for the community so that discussions occur on an informed basis

- Community groups should actively engage in the process including negotiation of benefits

- Consultations with educational institutions, techno-socio-economic expert groups and environmental organisations could further assist in the implementation of successful community benefit schemes
TCS15: Dealing with complex or entrenched public perception issues

Key issues identified

- A new technology producing rapid and obvious change in the landscape
- Modern communications and suspicion of ‘spin’ produce difficulties in knowing what is trustworthy information and what is not
- Connection with wider debates on climate change

Examples of good practice/lessons learned

- In Belgium, information on renewable energy generation and household equivalents supplied are given with the weather forecast
- Public education through a variety of channels
- Visitor centres at wind farms, e.g. Whitelee, Scotland

Implications for policy and practice

- Public education is always important to produce a well-informed debate. However, legitimate concerns must be addressed seriously
- Building trust is a long term process and depends upon openness, clarity, and integrity

TCS16: Undertaking socio-economic impact assessment (SEIA)

Key issue identified

- The socio-economic element of the SEIA process continues to have serious weaknesses, frequently being nonexistent or of poor quality

Examples of good practice/lessons learned

- Strong guidance on expectations for socio-economic impact assessment provided at a national level, e.g. the UK Overarching National Policy Statement on Energy and the French guidance for offshore developments. The lack of such guidance is frequently mentioned in Environmental Impact Assessments (EIAs) as a problem in carrying them out satisfactorily.
- Good quality examples of socio-economic impact assessment are available, e.g. the SEIA for Allt Duine wind farm, Scotland; Bald Hills, Australia; and of suitable methodologies for Economic Impact Appraisal, such as those developed by Scottish Enterprise
- Incorporation of consultations with local residents and businesses.
- Monitoring and evaluation of socio-economic impacts is rarely done for wind farms, but would be beneficial for building a base of evidence
- Socio-economic impact assessments carried out by specialist consultants within an SEIA are of better quality than those carried out by the lead consultancy, usually not an expert organization on socio-economic matters
Implications for policy and practice

- Clear guidance is needed from regulators as to what is expected in relation to socio-economics in planning applications for wind farm developments.

- Government and public sector development agencies could consider commissioning evaluations of socio-economic impacts of existing wind farms which could be used as ‘ready reckoners’ for future wind farms for EIA process – these could be used as a ‘public good’ by the industry.

- Developers need to be as open and transparent as possible about the likely socio-economic impacts which may arise as a result of developments, positive and negative.

Key findings and common issues

This is a diverse subject and many themes have specific properties which could be addressed with benefit for the goals of GP WIND. Oversimplification of a complex subject should be resisted. However, a number of key findings and common issues stand out:

Initial scoping

- Predicting sites likely to be subject to high conflict and, where practical, choosing less controversial alternative sites of similar economic potential, is the best method for developers of speeding up planning consents.

- This is likely to get more difficult as wind energy expands; but by then wind farms will be more familiar and the knowledge base for planning better.

- Brownfield (existing industrial landscape) usually better than Greenfield (rural areas) as regards minimising conflict potential.

Approach to stakeholders/community

- Early engagement (beginning before formal application stage).

- Clear, transparent and credible dialogue process.

- Address stakeholder concerns seriously and act on them as appropriate.

- Build trust through transparency and honesty in addressing implications of the development.

- Avoid negative stereotyping of causes for concern (e.g. ‘NIMBY’).

- Various forms of community participation/profit sharing can be very useful but require careful structuring on a community-by-community basis.

Planning and guidelines

- Clear and credible standards and expectations from regulators for EIAs, SIAs, etc.
• Strategic scoping – clear guidance on where wind farms are likely to be most acceptable and therefore have the smoothest planning process

• Guidelines on subjects of concern, e.g. landscape; species impacts; etc.

• Case for publicly funded research to improve available base of data on subjects of general (S)EIA relevance – avoid developers having to ‘reinvent the wheel’ with each (S)EIA – more efficient

• Above all: CLARITY and CREDIBILITY.

**Environmental**

• Landscape and species impacts leading causes of objections and delays/refusal

• Avoidance of conflicts with EU environment goals (e.g. Habitats Directive, Birds Directive) better than mitigation

• Monitoring using the BACI (Before-After Control-Impact) approach is preferable, and demonstrates a serious approach to environmental issues during the formal planning process

**Social/Economic**

• Collaborative, not imposed, development process: a mutual interest

• Involving communities in initial scoping of their area a good foundation for a smooth (and therefore more rapid) process

• As is community participation in the development itself, through part-ownership, profit share, etc. This needs to be carefully designed .

• Trust needs to be built actively and maintained carefully

**Conclusions**

• The single overarching theme of the case studies is the need for early (scoping phase onwards), genuine and constructive dialogue with stakeholders (including importantly, but not solely, the local community). Confrontational planning processes are long processes, with the serious prospect of consent refusal at the end. Many flawed proposals slowing the planning system might have been corrected, or been recognised as unrealistic, if problems had been identified and addressed, or recognised as insurmountable, before the formal planning process was entered.

• The formal planning system itself, and guidelines related to it, need to be clear, transparent and credible. All actors in the process need to know what is required of them and have confidence in the legitimacy of the process. Vagueness or lack of confidence in these matters often results in conflict and delay.

• The quality of social and economic impact assessment (SEIA) in the development process generally (although not always) requires improvement.
- Much of the information required of developers in EIAs and SEIAs which are common to many developments (i.e. are not site specific) might be more efficiently obtained through applied research at the regional to international level. This would reduce EIA and SEIA production time and improve quality.

- Much information of this kind is in fact available, but not readily accessible, especially internationally and to stakeholders outside the given specialist discipline (e.g., but not only, planning officers). Measures to improve information flow may be advantageous, so that information relevant to a given development proposal can be more easily located and accessed; especially internationally.

Beneath these high level conclusions, the full Thematic Case Study report contains many specific examples of good practice which could be applied to other circumstances as well as examples of lessons learned. The Good Practice Guidance and Toolkit which are being developed in Work Package 4 of the GP WIND project will increase the accessibility to and usefulness of these examples.