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1 FOREWORD

These Sustainability and Due Diligence Guidelines have been written to promote "best practice" by governments, developers, and local cooperatives when planning, constructing, operating and decommissioning large commercial wind farms as well as windmills for the local supply in both developed and developing countries.

Meeting the world wide need for more electricity in the transition from the fossil fuels to renewable energy presents us with a demanding challenge. The significant evidence of global warming tells us we are clearly living beyond environmental limits and consequently there have been calls from a number of authorities for deep cuts in greenhouse gas emissions up to 80% by 2050. In the same way as climate change has no regard for national borders, nor should strategies that seek to address the issue.

In this context renewable energy, and not least wind power, has a significant role to play in gradually eliminating the fossil fuel intensity of the global energy supply mix. Wind energy projects are, by their very nature, environmental projects in that they are designed to find sustainable supply forms, energy that might otherwise come from fossil fuels with their harmful impact on the environment and climate.

Renewable energy in comparison is a clean source of energy with the potential to contribute greatly to a more ecologically, socially and therefore economically sustainable future for the planet. They offer the chance for a sufficient energy supply and thus they create the opportunity for peaceful development and greater global security. The amount of energy reaching the Earth from the sun (biomass, wind, waves) is equal to tens of thousands of times the present world energy consumption, so there are no natural limitations to its use for the benefit of humankind. Wind energy use will be one cornerstone of the energy supply of the future. It will be part of a future integrated energy mix including solar energy, hydropower, biomass, geothermal energy, etc.

The exponential growth of wind energy developments over the past twenty years reflects a dramatic shift in thinking about how humankind impacts on the planet's resources and how we can tackle the many environmental and social challenges facing us. Renewable energy is providing the only realistic path forward to reducing the threat of irreversible climate change. The challenge is ensuring wind energy projects can meet economic, social and environmental sustainability criteria. These Sustainability and Due Diligence Guidelines have been written to assist in such a task.

2 PURPOSE OF THE GUIDELINES

The World Wind Energy Association (WWEA) has produced these guidelines to promote greater consideration of the environmental, social and economic aspects in the sustainability assessment of new wind projects. The guidelines are also relevant to the management and operation of existing wind power schemes. Thorough sustainability assessments should ensure that detrimental social and environmental impacts are avoided, mitigated or compensated. Of necessity, the principles articulated in these guidelines are generic since each project will have its own unique set of circumstances influenced by scale, geographic location, and social, legal and political environs. Issues of commercial sensitivities and public disclosure requirements will differ from jurisdiction to jurisdiction as determined by the legislation and standards applicable to each country. The guidelines will need to be adapted to the specific context of each particular project in both developed and developing countries. For example, sustainability considerations should be more readily determined and easily addressed for small projects.

The principles outlined in this document span the following six elements. Supporting comment provides further guidance where necessary:

- WWEA Policy
- The role of governments and regulatory frameworks
- Options evaluation and risk assessment
- Managing environmental outcomes
- Managing social outcomes
- Managing economic outcomes

The principles have been drafted to assist policy makers, regulators, wind power developers and operators with the evaluation and management of often competing environmental, social and economic issues that arise in the assessment, operation and management of wind power projects.

3 POLICY CONTEXT FOR WIND ENERGY DEVELOPMENT

Access to modern energy services is a fundamental prerequisite for human wellbeing, development and prosperity. However, nearly one-third of the world's population has no access to electricity and is therefore excluded from elementary development opportunities.

At the same time as energy demand grows, climate change is becoming the world's most pressing environmental problem. The Third Intergovernmental Panel on Climate Change (IPCC) report concluded that "human activities have increased the atmospheric concentration of greenhouse gases since the pre–industrial era, leading to global warming". As a consequence, the IPCC has called for cuts in CO_2 emissions of between 60-70% by the end of the 21st Century.

In addition, supplies of fossil fuel resources, particularly oil and natural gas, are likely to be constrained and become depleted within the next few decades. The production of fossil oil, in particular, may peak within a short time span. Undoubtedly, this will lead to serious problems for many countries in securing their energy supplies, especially as demand continues to increase. To overcome this it is envisaged that "renewable energies, combined with increased energy efficiency, will become a most important and widely available source of energy and will offer new opportunities for cooperation among all countries" (International Conference on Renewable Energies, Bonn 2004, Political Declaration - Point 2).

Clearly the current patterns of energy supply and demand are unsustainable. We are living well beyond the world's environmental limits and the root cause is primarily humankind's ever-increasing demand for energy – energy currently supplied in

the main from the burning of fossil fuels such as oil, gas and coal – and of uranium.

These circumstances present an impasse in energy policy that must be resolved. On the one hand there is a need to increase the availability of energy to reduce poverty and facilitate economic activity. On the other, increases in CO_2 emissions are leading to climate change and the manifold risks of nuclear power are threatening humankind. Against this background, non-depleting renewable energy resources, such as wind, have a vital role to play. In the long run, the global energy system can only work when completely based on renewable resources. In this context, the necessary shift towards renewable energies needs to commence immediately.

The World Summit on Sustainable Development (WSSD) in Johannesburg in September 2002 noted that "with a sense of urgency, [there is a need to] substantially increase the global share of renewable energy resources with the objective of increasing its contribution to total energy supplies."

The International Conference for Renewable Energies in Bonn (June 2004) stated that:

> "Renewable energies combined with enhanced energy efficiency, can significantly contribute to sustainable development, to providing access to energy, especially for the poor, to mitigating greenhouse gas emissions, reducing harmful air pollutants, thereby creating new economic opportunities, and enhancing energy security through cooperation and collaboration... Ministers and Government Representatives... reaffirm their commitment to substantially increase with a sense of urgency the global share of renewable energy in the total energy supply. They share the vision that renewable energies, combined with increased energy efficiency, will become a most important and widely available source of energy and will offer new opportunities for cooperation among all countries."

4 WWEA Policy

4.1 Commitment to sustainable development

The WWEA regards sustainable development as a fundamental component of social responsibility and participation, sound business practice and natural resource management. Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Sustainable development requires the integration of three components – economic development, social development and environmental protection – as interdependent, mutually reinforcing pillars. Eradicating poverty, changing unsustainable patterns of production and consumption, and protecting and managing the natural resource base underpinning economic and social development are overarching objectives of, and essential requirements for a sustainable future. Renewable energy, by definition, fulfils the sustainability criteria and will therefore deliver indispensable contributions to sustainable development.

WWEA recognises that bringing about 'sustainable development' is the collective responsibility of government, business, civil society, consumers and individuals. WWEA is, therefore, committed to working cooperatively with these sectors in achieving sustainable outcomes. This commitment is supported by the following policy priorities:

- The creation of favourable legal frameworks and regulatory conditions as advocated in these guidelines.

- The creation of a level playing field and fair market entry conditions for renewable energies. This means addressing the cost gap, caused by enormous subsidies for fossil and atomic energies with their non-internalised external costs (e.g. pollution), and the implementation of appropriate tariff schemes to encourage renewable energy solutions.
- The establishment of an international agency for renewable energy to provide a broader and better representation of renewable energies in the international and national arenas.

In the long-term the goal should be a 100% renewable energy supply. This will be the best way to provide all human beings with sufficient energy in a sustainable way.

5 The Role of Governments and Regulatory Frameworks

5.1 Governments and sustainability

Good governance within each country, and at the international level, is an essential prerequisite for sustainable development. The World Summit on Sustainable Development Implementation Plan (2002) listed some key sustainability criteria. These include:

- Sound environmental, social and economic policies;
- Democratic institutions responsive to the needs of people;
- The rule of law;
- Anti-corruption measures;
- Gender equity; and
- An enabling environment for investment.

Governments that establish and maintain sound environmental, social and economic policies create a foundation for the pursuit of sustainability. It is from this position - where clear and strong sustainability goals are identified - that governments can establish the appropriate regulatory frameworks for a sustainable future.

5.2 National and regional energy policies

National energy policies are the responsibility of individual Governments and should reflect a commitment to achieving sustainability goals and maintaining a strong dedication to the pursuit of renewable energy resources based on best practice experience.

The WWEA encourages countries to have in place national and/or regional energy policies prioritizing renewable energies. Each jurisdiction should clearly

set out its renewable energy development strategy so that the rules are known to all and arbitrary decisions are minimised. Basic requirements of renewable energy development and economics have to be regarded, like the provision of sufficient investment security. Clear national and/or regional policies established by governments contribute to the development of sound guidelines and frameworks that enable both government and industry to work together to achieve collective aims and encourages sustainable growth in energy resources.

5.3 Strategic assessment

National and/or regional energy policies should include a Strategic Assessment process. A Strategic Assessment should incorporate assessment of cumulative impacts, the determination of marine and land use effects and environmental priorities, as well as goals for economic growth. The policies should be framed in the context of the global need to reduce greenhouse gas emissions, to secure domestic energy supply, to increase public participation and to promote, therefore, the uptake of clean renewable energy options. They should also incorporate the three elements of sustainability -- economic, social and environmental -- in energy planning.

A Strategic Assessment process allows for the high level identification of environmental, social and economic issues and in cases where these conflict, the resolution of competing needs. This process is a mechanism by which sustainable development and global environmental goals can be reconciled with the management and conservation of more localized natural resources. It should be a participatory, streamlined process, focused on major issues, using common sense and readily available information, and with short and definite time limits for its completion. A comprehensive Strategic Assessment process applied by governments ensures that the best energy solutions are formulated and implemented for regions based on a 'best fit' energy policy, including a time frame for the implementation of a 100% renewable energy scenario.

One of the potential benefits of going through a Strategic Assessment process is to reduce uncertainty for developers of wind energy projects by prioritizing energy supply options and preferences. Likewise, a Strategic Assessment process should help to define those land or offshore areas that are available for development as well as those that are off-limits. Unsuitable sites may include, for example, areas of outstanding natural beauty, reserves and other areas of conservation significance. An adjunct to the Strategic Assessment process is for Governments to provide guidance on which social costs are to be borne by the developer and which are government responsibilities. Project critics sometimes confuse the roles of the developer and those in government determining the policy and development agenda.

5.4 Promoting wind power in energy production

Greenhouse gas emissions must be considered by governments in energy policy planning. There is no longer any reasonable doubt that greenhouse gas emissions are playing a key role in the increase, and acceleration, of global warming.

Against this background a continuing escalation in fossil fuel use will only worsen global warming. There is a growing international effort, therefore, to find alternative solutions that are in principle emission-free, but at the same time meet the energy needs of the developed and developing world.

Development of renewable energy resources is an essential part of the solution to this problem. In this context wind powered energy generation has a fundamental role to play. Use of wind for electricity generation is essentially a non-consumptive use of a natural resource. And it produces zero greenhouse

gas emissions. These features mean that wind energy compares very favourably when contrasted with alternative means of generation.

Wind energy generation has minimal environmental impact, and as a direct result energy policies formulated by governments need to reflect the positive benefit of wind energy in the pursuit of lower greenhouse gas emissions as well as the increased economic, social and environmental sustainability wind power can bring about. Such benefits can include job creation, income from ground rental for land holders and supply contracts for local service and manufacturing industries. Given that wind farms are often situated in rural areas, these socioeconomic benefits often occur in areas which are economically underdeveloped. Regulations need to be structured to promote the uptake of renewable energy projects on land and offshore, and to establish a variety of ownership models including pay-for-itself solutions and equal and fair access to market conditions.

6 Options Evaluation and Risk Assessment

6.1 Evaluation of alternative energy options

WWEA believes that broad energy option assessment should be the responsibility of national and/or regional governments as part of their energy development and greenhouse planning strategy.

Governments and project proponents should apply sustainability criteria when comparing project alternatives in order to focus on options that maximise environmental, social and economic benefits and, conversely, eliminate unacceptable alternatives early in the planning process.

It is important that relevant comparisons are made in relation to the basic sustainability of a project, although it is accepted that comparisons may not always be without difficulty. The comparisons should include the costs and benefits of integration with other renewable energy forms and energy storage systems. Examples of the latter include advanced batteries and flywheels. It should also be realized that an infinite variety of options is never available and fundamental factors such as resource availability and scale of requirements define the possible options that need to be assessed.

The sustainability of an option is relevant to the environmental assessment and regulatory approval processes. Proponents should demonstrate that their recommended option is sustainable and of a net benefit to the community. To facilitate this, early engagement with relevant stakeholders on the comparative benefits of feasible options is recommended.

Table 1 below describes sustainability aspects in assessing new energy projects.

Table 1 Sustainability Aspects in Assessing New Energy Projects

Sustainability Aspects	Considerations
1. Demonstrated need for the project	Assessments should be carried out by regulatory authorities (preferably as part of a Strategic Assessment process) or the proponent to demonstrate a need for the project. These assessments should include: • Evidence of likely future energy requirements • Evaluation of a range of alternative energy options (including practicable efficiency measures) to meet those requirements, and • Evidence that the project is the best option to meet those requirements.
2. Economic viability and planned monitoring of economic performance	The proponent of a project should have a high level of confidence in the economic viability of a project. The proponent should also have plans in place for ongoing monitoring of economic performance. The economic viability of each option investigated needs to be considered over the projected life of the facility. Issues such as refurbishment and decommissioning need to be considered when comparing options. Wind turbines have relatively low decommissioning/rehabilitation costs when compared with other power generation options.
3. Availability and cost of resources over the projected life of the facility	The availability and cost of fossil fuels may change over the operating life of a power station with availability decreasing and cost increasing. The annual yield of the wind resource is a fundamental consideration for wind power options.
4. Greenhouse gas emissions	In general terms wind power schemes and other renewable energy projects are of low carbon intensity and emit low levels of greenhouse gases. This compares, for example, with coal-fired systems that emit approximately 1000 tonnes of CO_2 per GWh produced. Many such externalities are frequently not accounted for in project comparisons.

5. Waste products (emissions or discharges to air, water and land)	Waste products are a major sustainability issue for fossil fuel and nuclear projects. Air emissions can extend the environmental footprint of some fossil fuel projects across national borders via acid rain. Negative health effects can also result from particulate and other emissions. Disposal of waste to tailings dams and radio-active waste repositories represents an inter-generational transfer of cost and environmental liability.
6. Appropriateness of the technology, levels of efficiency and service required	Projects should use appropriate and proven technology to maximise the benefits to be derived from use of a resource. Comparisons should be made on the efficiency of conversion and the flexibility and reliability of the product provided. The comparison should take account of the level of service required (e.g. some electric systems may require peak load capacity while others may seek stable base load). Wind power projects generally need to be integrated into larger power systems. The intermittent nature of the wind resource often requires support from other types of generation (for both grid and non-grid applications) or the integration in combined local energy supply structures. Technological advances are allowing an increasing contribution by wind power into electricity systems.
7. Energy payback ratio	Energy payback ratio compares the energy produced during the normal lifespan of a power plant with the energy required to build, maintain, and fuel the generating equipment. A high energy payback ratio is preferred over a low one, as is the case for wind power.
8. Distribution and sustainability of economic benefits	The project should provide economic benefits across the local affected community and broader region. Plans should also be in place to monitor the future distribution and sustainability of economic benefits and social consequences thereof.
9. Additional or multiple use benefits	Wind projects can provide benefits to the local community like additional income for farmers, local owner cooperatives and municipalities, upgrading transmission lines and other types of infrastructure to improve reliability of service or increased tourism.

10. Poverty reduction through flow on benefits to local communities via employment, skills development, investment opportunities and technology transfer	Many energy development projects provide new income through local ownership and generate jobs for the local population. These include direct and indirect employment opportunities, both during construction and for the life of the project, as well as expansion of the local skills base, capacity building, investment opportunities and the benefits of technology transfer.
11. Maximise opportunities and benefits for, and not posing significant unsolvable threats to, vulnerable social groups	In general terms, wind projects do not pose significant threats to vulnerable social groups. However, any threats and opportunities need to be identified. Opportunities for local involvement need to be maximised, and projects that present significant threats to vulnerable social groups should be avoided if the threats cannot be mitigated.
12. Community support and/or lack of community opposition	Wind projects with full or partly local ownership will more easily obtain local acceptance; projects that have local community support should be favoured over those that have widespread opposition.
13. Safety issues and hazards	Safety issues and hazards should be identified and the risks (likelihood and consequences) evaluated. Management measures should be planned to reduce or eliminate risks.
14. Environmental impact assessment	An environmental impact assessment needs to be undertaken for the project and it should: • thoroughly identify relevant issues • include appropriate levels of stakeholder consultation, and • recommend effective community and regulator-supported mitigation strategies and/or compensation measures.
15. Extent of land or marine area affected (environmental footprint) and associated aquatic and terrestrial ecological impact	The relatively dilute nature of renewable resources often means that these types of projects can have a large environmental footprint per unit of energy produced. Projects that are spread over large areas often have limited or easily mitigated environmental effects. Wind farms, for example, have limited impact on other land and marine use activities. Some fossil fuel-based power stations have a very large footprint when the area affected by air emissions is considered. The impact of the environmental footprint needs to be assessed in relation to the associated aquatic and terrestrial ecological impacts and the degree to which they can be mitigated and/or compensated.

16. Avoidance of exceptional natural and human heritage sites	Developers should make every effort to avoid, or reduce to a minimum, alterations to ecological, cultural or heritage sites of exceptional national and international value.
17. Level of impacts on rare, vulnerable or threatened species, maximising habitat restoration and protecting high quality habitats	Potential impacts on rare, vulnerable or threatened species should be carefully assessed as part of the decision-making process. Consideration of the creation of alternative habitats or the protection of adjacent areas should be considered as part of any mitigation program. Habitats of varying quality and priority should be given to protecting or restoring higher quality habitats. Significant damage to areas of high conservation value (including critical habitat for endangered species) should be avoided when adequate mitigation or compensation is not feasible.
18. Environmental management plans	For new projects, evidence should be available of effective planning for management of environmental issues during construction, operation and decommissioning.
19. Environmental management system	New projects should have plans in place for the implementation of a comprehensive and effective environmental management system. The plans should preferably include an intention to certify the system to an international standard, (e.g. ISO 14001).
20. Regulatory compliance	All relevant regulatory compliance issues should have been identified. Plans should be in place, as part of overall or specific management systems, to measure and report on compliance with these regulatory requirements.

6.2 Due diligence assessment of on-shore and off-shore wind energy systems

A due diligence review is an instrument to measure risk. It is usually performed as part of a decision on an investment in projects and can cover a broad range of risks. It is recommended that due diligence assessments be carried out on sustainability aspects of new and operating power systems prior to investment decisions.

Risk analysis requires risk to be determined from the combination of its components, likelihood and consequence. Tables 2 and 3 give examples of scales of likelihood and consequence. The relationship between the two components will be a function of the context of the risk and may depend on many factors. It can be illustrated by means of a matrix such as given in Table 4. Where risk ratings are medium or high, measures are required to ensure reduction or effective management of risk.

Table 2 – Likelihood

Level	Descriptor	Description
A	Almost certain	Is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Moderate	Might occur at some time
D	Unlikely	Could occur at some time
E	Rare	May occur only in very exceptional circumstances

Table 3 – Consequence or Impact

Level	Descriptor	Examples
1	Insignificant	Very minor environmental impact, e.g. occasional bird strike of abundant and non-threatened species
2	Minor	Minor environmental impact, e.g. on-site release of materials, contained with moderate clean-up costs
3	Moderate	Medium level environmental impact requiring ongoing management or expensive modification of equipment
4	Major	Major environmental incident, high financial loss, high probability of prosecution
5	Catastrophic	Major environmental incident of national or even global significance, very high and long-term remediation costs

Table 4 – Level of Risk

Likelihood		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
	Level	1	2	3	4	5
A	Almost certain	Low	High	High	High	High
B	Likely	Low	Medium	High	High	High
C	Moderate	Low	Medium	Medium	High	High
D	Unlikely	Low	Low	Medium	High	High
E	Rare	Low	Low	Low	High	High

Modified after Standards Australia Risk Management Guidelines - Companion to AS/NZS 4360:2004

Table 5 details the main risk scenarios for a wind power project. In any due diligence exercise, these scenarios and associated management strategies should be risk assessed in accordance with the process outlined in Tables 2, 3, and 4. This risk assessment should be carried out at the appropriate stage in the project life cycle (* P = Pre-construction, C = Construction, O = Operation, D = Decommissioning).

Table 5 – Sustainability Due Diligence Checklist

Relevant Issues	Risk Scenarios	Management Strategies	*Stage in Project Lifecycle
1. Regulatory environment	Absence of clear Strategic Assessments	Proponent carries out some level of baseline research.	P
	Seriously deficient or overly complex environmental legislation	Early agreement with regulators on rules that apply to the project.	P/C/O/D
	Lack of understanding of regulatory requirements	Process to identify all relevant regulatory compliance issues. Planning for measurement and reporting on compliance with these regulatory requirements.	P/C/O/D
2. Economic viability of the project	Inadequate or poor business case	Responsibility lies with the proponent to ensure that thorough cost-benefit analysis is undertaken and plans are in place for the ongoing monitoring of economic performance.	P/C/O/D
3. Economic impact on other existing or proposed land or marine uses near the site of the project	Unacceptable detrimental impact on other permitted uses	Identification and understanding of economic impacts on other uses such as fishing, dredging, recreation or agricultural land use. Negotiation and payment of compensation where applicable.	P/C/O/D
4. Community and stakeholder support for the project	Community opposition or loss of support for the project	Comprehensive stakeholder consultation and participation process.	P/C/O/D
5. Safety issues and hazards	Unacceptable levels of worker or community safety	Thorough analysis of safety and hazard issues. Appropriate management and mitigation strategies planned or in place.	P/C/O/D
	Non-compliance with air or marine traffic safety regulations	Compliance with statutory, administrative, or contractual obligations concerning air or marine traffic safety issues.	C/O/D

Relevant Issues	Risk Scenarios	Management Strategies	*Stage in Project Lifecycle
6. Environmental impact assessment	Inadequate environmental impact assessment	Assessment should • identify relevant issues at an early stage • include appropriate levels of stakeholder consultation, and • recommend effective and community and regulator-supported mitigation strategies and/or compensation measures.	P/D
7. Degree of environmental and social impacts	Unacceptable impacts to exceptional natural and/or human heritage sites	Avoidance or reduction to a minimum, of alterations to ecological, cultural or heritage sites of exceptional national and international value.	P/C
	Limited opportunities and/or unacceptable threats to vulnerable social groups	Where projects pose threats to vulnerable social groups, plans are in place for appropriate social and cultural enhancement programs that will result in improved conditions for those groups.	P/C/O
	Broad environmental footprint with significant aquatic and/or terrestrial ecological impacts	Adequate assessment of potential impacts and appropriate use of avoidance, mitigation, or compensation strategies. Wind farms can be spread over large areas, but usually have limited impact on other land and marine use.	P/C/O
	Project threatens rare, endangered, or migratory species, e.g. bird species, rare plants, marine mammals, fish or seagrass beds	Location away from critical habitat areas, and/or adequate risk modelling to identify level of potential threat to rare or endangered bird species. Targeted management plans need to be developed for species of conservation significance. Translocations or habitat rehabilitation may be options, along with identification of suitable habitat for 'reserve' management. Monitoring should be conducted at regular intervals and form part of permit/ licence conditions.	P/C/O/D

Relevant Issues	Risk Scenarios	Management Strategies	*Stage in Project Lifecycle
	Community complaints or regulatory opposition to project because of noise from power project infrastructure or construction activities. These complaints may relate to noise characteristics, (e.g. volume and intensity), as well as duration, time, and place	An issue that needs to be thoroughly addressed, particularly when wind farm projects are sited near populated areas. Ensure the project complies with relevant regulatory standards. Other mitigation strategies could include review of siting options and choice of turbines. Prior to construction a noise impact assessment can be conducted to model noise output from the wind farm based on a nominal turbine layout and information about prevailing background sound. This data can be used to generate an acceptable attenuation distance from noise generating infrastructure and dwellings. A noise buffer zone can protect potentially affected property and can be designed to conform to relevant national and international standards. Mechanical tonal noise from modern wind turbines has been reduced to low levels. Community complaints should be dealt with in an open and systematic manner. One possible process would be the development of a query and complaints protocol and register.	P/C/O/D

Relevant Issues	Risk Scenarios	Management Strategies	*Stage in Project Lifecycle
	Unacceptable visual impacts in sensitive landscapes/ seascapes	A significant issue when a project is close to populated areas or sited in areas with high scenic or recreational value. Mitigation measures are limited, but can include wind farm layout, and colour and structure of turbines. Sound community consultation and participation, with appropriate representations of the future appearance of the wind farm, is often effective. Avoidance of areas with high scenic or recreational value is generally required. Construction of visitor interpretation facilities may add to public acceptance in locations where there are opportunities to build on the visitor experience through local tourism.	P/C
	Communications interference from wind farms may be a concern for defence, aircraft, telecommunications and radar installations, and can take several forms. Interference may also extend to impacts on television services	Communications interference is more likely to be a problem if metallic wind turbine blades are used. The appropriate management strategies are stakeholder consultation and compliance with relevant guidelines.	P/C/O
8. Associated infrastructure	Inadequate assessment of or unacceptable economic, social and/or environmental impacts resulting from associated infrastructure, such as powerlines or roads.	Adequate social and environmental impact assessment and appropriate construction and environmental management plans for associated infrastructure. Effective avoidance, mitigation, or compensation.	P/C/O/D

Relevant Issues	Risk Scenarios	Management Strategies	*Stage in Project Lifecycle
9. Environmental management plans	Inadequate environmental management plans	Planning for or implementation of, effective environmental management plans during the construction and operational phases of the project. Management plans should include procedures for dealing with all relevant issues. Procedures should be in place for hazardous materials and waste. Storage handling, use and disposal of all materials should conform to relevant industry standards. An emergency response plan should be developed, and staff training undertaken. Management plans need to deal with marine construction issues. These should address sediment dispersion and noise/vibration, which can impact on fish and mammal species. Bubble walls and other strategies may need to be implemented to minimise dispersion of acoustic vibrations through the water column.	C/O/D
10. Environmental management system	Inadequate environmental management system	Planning for, or implementation of, an effective environmental management system. Ideally, the system should be certified to a relevant international standard, e.g. ISO 14001.	P/C/O/D

6.2.1 Legal and institutional arrangements

A fundamental aspect of managing risk associated with a wind power scheme is to have processes in place that ensure compliance with all relevant laws, policies, permits, agreements and codes of practice.

These may include, but are not limited to:

- Electricity supply industry legislation;
- Environment protection legislation and associated regulatory standards and permits;
- Conservation and threatened species legislation;
- Cultural heritage and indigenous rights legislation;
- Coastal protection legislation;
- Occupational health and safety legislation;
- National, regional and local government policies;
- Corporate law requiring financial and environmental reporting;
- Relevant international laws, conventions and protocols; and
- Voluntary commitments and signed agreements.

Wind power operators should undertake an analysis of legal risks with the aim of developing appropriate response strategies, identifying activities that need to be managed, and determining priorities.

Investors in major long-term projects such as wind power developments need a reasonable degree of certainty regarding the on-going viability of their investments. Adjustments to operations may be required as new information becomes available and the results of monitoring programs are assessed. If governments introduce new environmental or resource usage objectives they should consider the impacts on the economic viability of wind power schemes, as well as other economic and social implications, and compensate accordingly.

7 MANAGING ENVIRONMENTAL OUTCOMES

7.1 Optimising environmental outcomes for wind power schemes

Wind farms can have a number of environmental impacts that need to be identified early and avoided, mitigated, or compensated. Effective environmental management over the life of the wind farm should ensure sustainable operation of the facility. Crucial in this process is the effectiveness of the initial environmental impact assessment.

7.1.1 Environmental assessment (EA) principles

Environmental assessments (also known as environmental impact assessments or environmental impact statements – EIAs and EISs) are conducted to inform decision makers of positive and negative effects of a project and associated mitigation measures.

WWEA's policy position is that Environmental Assessments (EAs) should be applied at the project level.

EAs should take account of relevant higher-level national and/or regional policies and strategic assessments, including assessments already completed for potential wind farm sites. Initial screening should be conducted to determine if a project is likely to have significant effects on the environment by virtue of its nature, size or location.

EAs should be conducted for all on or offshore wind power projects that have the potential for significant impacts on the environment. EAs should be based on good science and factual information. They should be relevant to the scale and nature of the project in question and factor in existing information.

WWEA members should apply appropriate procedures or codes of practice regarding stakeholder participation and environmental protection.

Stakeholders should be given opportunities to participate in decision-making processes. Their roles, and rights to access information, should be documented in language relevant to their needs.

WWEA supports transparency of process and co-ordination between the different sectors involved - government, developer and community interests. It recommends developers consult with local and national resource agencies, defence, telecommunications and coastal management authorities at the earliest opportunity to assist in the determination of the environmental issues to be addressed, the studies required, and to clarify the timelines that apply.

Regulatory authorities should have specified and reasonable timelines for their assessment and approval processes.

WWEA acknowledges that an EA for a large infrastructure project, such as a wind power scheme, takes place in a broad political, social and economic context. It is one step in a wider decision making process, and is generally written to provide authorities with the following information.

- A full description of the project;
- A statement of objectives, including clear targets and proposed indicators of success;
- A description of the existing environment in the area where the project is to be developed;
- Project justification, including evaluation of project alternatives;
- Economic, social and environmental considerations, including the consequences of not undertaking the project;
- Any mitigation measures that will or could be implemented to minimise environmental harm and/or enhance the environment; and
- A description of the stakeholder communication/consultation process undertaken.

WWEA supports post-construction auditing to measure performance against objectives, targets and proposed indicators of success. This should be detailed in the project EA.

A key element for public acceptance can be the negotiation of an agreement between the proponent and the local community on the nature and scope of the collaboration required to conduct the EA.

7.1.2 Environmental management systems (EMS)

WWEA believes that wind power operators, as well as manufacturers of associated equipment, should adopt internationally recognised environmental management systems (such as ISO 14001).

The components of an EMS can be summarised as follows:

- Management Commitment;
- Environmental Policy;
- Environmental Aspects and Impacts;
- Objectives and Targets;
- Roles and Responsibilities;
- Planning and Programs;
- Regulatory Compliance;
- Document Control;
- Operational and Emergency Procedures;
- Training;
- Monitoring and Measuring; and
- Review (including environmental audits) and Improvement.

Wind power operators should also consider incorporating their EMS as part of a broader sustainability management and public reporting program. Open and continuous stakeholder consultation enhances longer-term relationships with the local community, regulators, and shareholders.

8 MANAGING SOCIAL OUTCOMES

Communities generally benefit from efforts that will help to reduce greenhouse gas emissions from renewable energy developments such as wind farms. In addition, wind energy projects can contribute to employment, often in regional communities. Linked to this are investment attraction, infrastructure development and local tourism opportunities. These in turn benefit local industry, support the social fabric of communities and promote economic activity. With a reliable power supply, industry is encouraged and social capital increases.

Managing social outcomes needs to include the resolution of differences between the goals of the developer and those of the local community. Gaining community acceptance requires that issues of concern are identified and resolved in an open and transparent manner.

8.1 The role for stakeholder and community consultation

The WWEA believes that social sustainability goals can be achieved if adequate consultation is undertaken with stakeholders. This needs to include residents in directly affected communities. Stakeholder consultation is effective if local community views are carefully considered and, where appropriate, incorporated in the project's assessment, design and implementation.

The following considerations should be taken into account when determining social aspects of sustainability:

- Impacts on the community, stakeholders and the environment are identified;
- Stakeholders are informed about the project and its likely implications for them;
- Negative social impacts are avoided, minimized, or adequately compensated.
- The proposed project is shown to be the best alternative, following demonstrated consideration of relevant stakeholders concerns and other social issues;
- A negotiated and agreed outcome is achieved between the developer and local community wherever possible; and
- The community and environmental resources are managed in a sustainable way, and on-going monitoring and liaison with local community groups continues through the life of the project.

8.2 Gaining community acceptance – managing social impacts

Various issues affecting communities and individuals need to be managed during the planning, construction and operation of wind power facilities. Possible social impacts that require consideration are identified below:

- Changes to resource use and biodiversity in the area of the proposed project and the impacts this may have on the local community;
- Changes to visual amenity, noise levels and other impacts such as shadow flicker, dust levels and traffic congestion, during construction and operation;
- Distribution of benefits among affected parties; and
- Effectiveness and on-going performance of compensatory and benefits programmes.

8.3 Gaining community acceptance – proposed strategies

Broad community acceptance of a project, particularly in its early phases, will greatly assist in its successful implementation. To achieve community acceptance the following should be undertaken by the proponent and/or regulatory authorities:

- Adequate consultation should be undertaken, with relevant local, regional and national agencies and any legislation, regulations, codes of practice or guidelines of government agencies should be complied with;
- Providing affected communities with identifiable benefits, such as local co-operative ownership, self funding solutions and other types of investment opportunities;
- Stakeholders and impacted communities should be identified and provided with the opportunity to have informed input into the decision making process. The community must view the process as being open, fair and inclusive;
- Minority and/or vulnerable groups should be specifically identified and steps taken to ensure that they are adequately represented in any consultation process;
- The local knowledge of communities and stakeholders should be utilized and actively involved in project planning to minimise adverse impacts and maximize benefit outcomes;
- The exchange of information provides an educative function for stakeholders and the developer alike and can lead to subsequent training opportunities;
- Affected stakeholders should participate in the development and implementation of mitigation measures;
- A process for addressing future concerns or risks from the project needs to be outlined to stakeholders at the start of the project;
- Communities and/or groups that are impacted by a project should be the first to benefit. These groups should also participate in the identification, planning and distribution of benefits;
- Support additional community infrastructure associated with the project, for example electricity connection, where positive benefits to the community will result;
- Local and regional resources (particularly labour) should be utilised in the development and operation of the project. Local communities will then experience first-hand the benefits of the scheme to their community;
- Communities that will be affected should be compensated for their loss. This will include those persons or groups displaced by associated infrastructure developments such as roads, those communities who experience loss of livelihood, and those who depend on common resources such as fisheries and agricultural land that might be altered by the project; and
- Social compensation projects (such as new roads) should undergo appropriate environmental assessment;
- Developers should be open and transparent with stakeholders and be respectful of local values and, cultural norms;
- A process should be developed to effectively deal with community queries and complaints;
- Provide information to stakeholders in language and concepts appropriate to the stakeholder needs and requirements.
- Promote conditions where community ownership, pride and stewardship can flourish. eg. opening should be celebrated with local community involvement.

9 MANAGING ECONOMIC OUTCOMES

Economic sustainability, from a project perspective, depends on the ability to generate profit, but not at the expense of the local community or the environment. Sound economic practice relating to wind power projects must consider the triple bottom line – economic, social and environmental sustainability. The efficient use of economic resources requires that alternatives have been carefully evaluated, that the best options are selected, and that hidden and unforeseen costs do not emerge in the future. This is the basis for sound economic practice.

With new developments, capital and operating costs should be taken into account over the lifetime of a project. Direct and indirect costs and benefits should be identified and, where possible, quantified in monetary terms. Nevertheless, putting money values on externalities such as environmental or social attributes is not a simple task. For example, rarely are environmental goods traded in the market place, and consequently the decision as to what price should be placed on a particular environmental or indeed social, attribute is not necessarily easy.

Most significant wind farm financial costs are incurred at the construction stage. Once built, a wind project is virtually immune from further inflationary pressures for its planned economic life. There are no fuel costs that may escalate through time. Older wind power turbines can be replaced or decommissioned relatively cheaply. Wind power projects have favourable energy payback periods (the amount of energy derived from the generating station compared with the amount of energy used in its construction and operation). These projects can often be constructed in months, not years, and can be incrementally added to an electricity grid.

9.1 Institutional framework

Governments need to establish a suitable investment climate and communicate this widely. They should also make known their priorities. In particular, governments should ensure that:

- The legislative framework for decision making is one in which an investor can have confidence in terms of clarity, the impartiality of the legal process, and the ability to resolve disputes without undue costs or delay.
- An efficient institutional framework is in place to ensure that all stakeholders are aware of factors that could affect them and unnecessary delay or conflicts of interest are avoided.
- The long-term interests of the state should be taken into account in determining project priorities.

9.2 Identifying costs and benefits

Economic sustainability decisions should be based on a comprehensive evaluation of affected resources, and project costs and benefits. Some of these may be difficult to precisely quantify and could be unevenly distributed throughout local and wider communities. The following elements should be taken into account:

Costs

- Construction, operations and maintenance costs should be fully detailed, recognising the split between foreign and local currency, financing options, and the anticipated exposure that these might give in terms of exchange rate variation.
- The full environmental and social costs of the project need to be recognised, quantified where possible and included in feasibility assessments of the project.
- The full capital and recurrent costs of environmental and social mitigation plans should be included.

Benefits

- Allowance should be made of the accrued benefits at a national or regional level, including any additional taxes, industrial development and improved infrastructure or multiple use benefits that could be attributed to the project.
- Recognition of savings on greenhouse gas emissions, and improved local air quality, to the extent that this can be quantified.
- Where feasible, allowance should be made for benefits that accrue to local communities including integrated local renewable energy supply systems and ownership, job creation, local industry, investment opportunities and tourism.

9.3 Allocation of benefits

The principal stakeholders in any project are future owners, the developer, the electricity user/supplier (if different), governments, financing agencies, local communities, investors and individuals directly affected by the scheme. These stakeholders should be identified early in the planning and development approval process and their legitimate interests acknowledged and taken into account in the financial and economic evaluation processes.

The above objectives imply the need for the following:

- Balanced commercial agreements in the case of privately funded projects;
- Reasonable returns on equity, consistent with the risk profile and international norms;
- Transparency in procurement processes;
- Directly negotiated contracts to be subject to independent audit; and
- Ongoing auditing/monitoring of economic performance against projected benefits.

10 WWEA Member Commitment to Sustainability

Wind power, provided that it is developed and operated in a sustainable manner, will play an important role in helping to address some of the major global challenges of the 21st century. One of these challenges is to alleviate poverty and increase living standards through the provision of affordable access to electricity and basic services. This is a necessary step towards achieving more equity between different socio-economic groups within nations, and between developed and developing nations.

Another major challenge is global warming. This is one of the world's most pressing environmental issues and requires the increasing development of less carbon intensive methods of energy production. A third challenge is the security of energy supply in all parts of the world, having in mind that fossil as well as nuclear resources are facing significant constraints and even depletion. On all of the three counts outlined above, wind power, especially in combination with other renewable energy forms and appropriate storage facilities, is making, and will continue to make, a significant contribution.

WWEA members are owners, operators and developers of wind power projects. They are committed, through their membership of WWEA, to the underlying principles of sustainability outlined in this document.

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13 FEEDBACK

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