

**Wind Turbines and International Biodiversity-Related Agreements:  
Emerging Trends and Recommendations<sup>1</sup>**  
(Final Draft- October 14, 2006)

Maria Socorro Z. Manguiat  
Legal Officer, IUCN Environmental Law Centre  
Bonn, Germany<sup>2</sup>

Linda Siegele  
Staff Lawyer, Foundation for International Environmental Law and Development  
London, England

Debra A. Jacobson  
Professorial Lecturer in Energy Law, The George Washington University Law School  
Washington, D.C.

“. . . the debate over whether wind energy should be promoted is largely a dead issue in many countries, the issue for today and tomorrow is how . . . nations get this development right.”

Carol A. Smoots  
Editor, Oil, Gas & Energy Law Intelligence  
Volume 3, Issue 2 (June 2005)

**I. Introduction**

Discussions on wind energy tend to generate a lot of excitement regardless of whether one supports or opposes its development. Wind energy is the fastest growing source of renewable energy, and it is currently viewed as the most viable renewable energy source because of its cost competitiveness. Wind energy also is gaining greater prominence because of the commitments made by most industrialized countries under the Kyoto Protocol to reduce their greenhouse gas emissions to agreed levels by 2012. In addition, wind energy and other renewable sources serve to reduce imports of natural gas and oil from politically unstable regions of the world, thereby improving energy security and increasing fuel diversity. Thus, the image of wind turbines has come to symbolize the shift to clean and secure energy and to a carbon-free lifestyle.

Wind energy also results in substantial additional environmental benefits compared to traditional fossil fuel fired generation. Wind generation is not only produced with zero emissions of carbon dioxide but it also can eliminate emissions of toxic pollutants (e.g. mercury) and conventional air pollutants (e.g. smog-forming

---

<sup>1</sup> All statements in this paper are personal to the authors and should not be attributed as the official views or positions of the institutions with which they are affiliated. The authors also would like to acknowledge the valuable contributions of the various reviewers who provided comments, particularly Loic Blanchard of the European Wind Energy Association.

<sup>2</sup> Ms. Manguiat is currently working with the Compliance Programme of the UNFCCC Secretariat United Nations. However, her contributions to this paper were made as a Legal Officer to the Environmental Law Center of the World Conservation Union (IUCN).

nitrogen dioxide and acid-rain forming sulphur dioxide), and it avoids serious water pollution. Furthermore, the adverse impacts caused by mountaintop mining and strip mining of coal, including acid mine drainage and land subsidence are avoided, and the negative effects of nuclear power, including radioactive waste disposal, security risks, and nuclear proliferation risks, are not created. Finally, wind power can have a long-term positive impact on biodiversity by reducing the threat of climate change – the greatest threat to biodiversity. At the same time, the construction and operation of both onshore and offshore wind turbines can result in potential negative local environmental impacts on birds, bats and cetaceans, landscapes, sustainable land use (including protected areas), and the marine environment.<sup>4</sup>

The focus of this article is on biodiversity-related international agreements and their relationship to wind energy development. The article seeks to summarize the major biodiversity-related international agreements, to analyze the implications of these agreements on wind energy development, and to recommend actions that seek to harmonize biodiversity, climate protection, and wind development goals.

In most instances, the text of biodiversity-related multilateral agreements and instruments and the decisions, resolutions or recommendations adopted by their decision-making bodies do not pose a *direct* barrier to the development of wind energy. It is generally the implementation of the obligations under these instruments, i.e. the concrete policies and measures adopted by parties carrying out these obligations that can create potential barriers to the development of wind energy. The mixture of policies and measures adopted by a country in implementing an international agreement will depend on that country's particular circumstances. Therefore, it is difficult to generalize about the positive and negative effects of an international agreement at the national level.

There are, however, a few international agreements where direct references to the risks posed to biodiversity by the development of wind farms have given rise to obligations on parties. These agreements are most notably the Convention on Migratory Species and Wild Animals (CMS or the Bonn Convention) and the Agreement on the Conservation of Populations of European Bats (EUROBATS). Section II of this paper will examine the impacts of the direct provisions in the CMS and EUROBATS agreements on the development of wind energy. Section III surveys other international legal instruments which may also impact the development of wind energy. Section IV provides conclusions and recommendations.

---

<sup>4</sup> It should be noted that experts also have identified some local positive impacts of wind turbines, including: new bird species appearing near wind farms because the area is excluded from hiking and hunting; revitalization of fish stocks in some offshore areas because of prohibitions on commercial fishing and because the turbine foundations can serve as natural "reefs."

## II. CMS, EUROBATS and Wind Turbines

While it is acknowledged that the potential impacts of wind energy development on biodiversity<sup>5</sup> need to be examined further, the information that is currently available has been deemed sufficient by at least two of the decision-making bodies of international biodiversity-related agreements to impose specific obligations on parties to the agreements. These are the Convention on Migratory Species and Wild Animals (CMS) and the Agreement on the Conservation of Populations of European Bats (EUROBATS).

CMS Article 3.4(b) requires parties that are Range States of a migratory species “to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species.” The question of whether wind farms could constitute an activity that seriously impedes or prevents the migration of species has clearly been answered in the affirmative, as the recommendations discussed below will show.

The Conference of the Parties (COP) of the CMS recognizes that climate change may significantly affect the behaviour, distribution and abundance of migratory species and may change the ecological character of their habitats.<sup>6</sup> At its fifth meeting, the CMS COP, in Recommendation 5.5 (Climate Change and its Implications for the Bonn Convention), requested the CMS Scientific Council to review the results of past and present scientific work on the ecological and other effects of climate change, assess the relevance and importance of such work for the conservation of migratory species, review existing scientific links between the CMS and other bodies undertaking work in this area, formulate proposals for improving and strengthening such links, and report its conclusions and make recommendations to the next meeting of the Scientific Council.

While climate change can be a major threat to migratory species, the measures taken to mitigate climate change themselves can pose a threat to these species. Thus, as a result of the mandate in CMS Recommendation 5.5, the CMS Scientific Council recommended the adoption of a resolution on wind turbines and migratory species at the seventh meeting of the CMS COP.<sup>7</sup> Resolution 7.5 (Wind Turbines and Migratory Species) acknowledges the environmental benefits of wind energy, ‘especially for addressing climate change’, as well as the significance of reducing climate change for the long-term survival of migratory species.<sup>8</sup> Nevertheless, the resolution notes that wind turbines, especially those in marine areas, represent a new method of large-scale energy production whose actual effects on nature and on the different components of biodiversity cannot be fully assessed or predicted at present.<sup>9</sup> The resolution then goes on to list some of the possible negative impacts of wind turbines on migratory

<sup>5</sup> See, for instance, “Windfarms and bird: an analysis of the effects of wind farms on birds, and guidance on environmental assessment criteria and site selection issues.” (CMS/ScC12/Inf.27) available from the secretariat of the Convention on Migratory Species.

<sup>6</sup> CMS Resolution 8.13, Climate Change and Migratory Species, 4th prefatory statement.

<sup>7</sup> The seventh meeting of the COP of the CMS was held in Bonn, Germany from 18 to 24 September 2002.

<sup>8</sup> 6th prefatory clause, CMS Resolution 7.5, available at [http://www.cms.int/bodies/COP/cop7/proceedings/pdf/en/part\\_1/Res\\_Rec/RES\\_7\\_05\\_Wind\\_Turbine.pdf](http://www.cms.int/bodies/COP/cop7/proceedings/pdf/en/part_1/Res_Rec/RES_7_05_Wind_Turbine.pdf)

<sup>9</sup> *Id.*, 7th prefatory clause.

species of mammals and birds, as well as on their food sources and habitats, including the following:

- Destruction or disturbance of permanent or temporary feeding, resting and breeding habitats;
- Increased collision risk for birds in flight, noting especially the potential risk that several hundred offshore wind turbines with heights of up to 150 meters may present as obstacles in flyways;<sup>10</sup>
- Risks arising from electric and magnetic fields of connecting power cables; and
- Emission of noise and vibrations into water.<sup>11</sup>

In view of these concerns, CMS Resolution 7.5 calls upon parties<sup>12</sup> to take the following specific actions:

- To identify areas where migratory species are vulnerable to wind turbines and where wind turbines should be evaluated to protect migratory species;
- To apply and strengthen, where major developments of wind turbines are planned, comprehensive strategic environmental impact assessment procedures to identify appropriate construction sites;
- To evaluate possible negative ecological impacts of wind turbines on nature, particularly migratory species, prior to deciding upon permission for wind turbines;
- To assess the cumulative environmental impacts of installed wind turbines on migratory species; and
- To take full account of the precautionary principle<sup>13</sup> in the development of wind turbine plants, and to develop wind energy parks taking account of environmental impact data and monitoring information as it emerges and taking account of exchanges of information provided through the spatial planning process.<sup>14</sup>

Relevant intergovernmental organizations as well as the European Community and the private sector also are invited to cooperate with the CMS in efforts to minimize the possible negative impacts of offshore wind turbines on migratory species.<sup>15</sup>

---

<sup>10</sup> *Id.*, 12th prefatory clause.

<sup>11</sup> *Id.*, 9th prefatory clause.

<sup>12</sup> As at 1 December 2005, CMS had 95 Parties.

<sup>13</sup> CMS itself does not have a specific provision on the precautionary principle. Principle 15 of the Rio Declaration on Environment and Development adopted at the United Nations Conference on Environment and Development (UNCED) that took place from 3 to 14 June 1992 in Rio de Janeiro, Brazil, states:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats to serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

<sup>14</sup> *Id.*, paragraph 1.

<sup>15</sup> *Id.*, paragraph 3.

The CMS COP also instructed its Scientific Council to assess existing and potential threats from offshore wind turbines in relation to migratory mammals and birds (including their habitats and food sources), to develop specific guidelines for the establishment of these facilities, and to report to the COP at its next meeting. The Working Group on Threats – Windfarms & Powerlines of the CMS Scientific Council, which met from 16 to 18 November 2005, did not complete the proposed guidelines for submission to COP 8, which took place from 20 to 25 November 2005 in Nairobi, Kenya.<sup>16</sup> Therefore, these guidelines will have to be presented for adoption at the next CMS COP, which is not expected to be convened before 2008.

The issue of migratory species and wind farms, however, did find its way into CMS Resolution 8.18, Integration of Migratory Species into National Biodiversity Strategies and Action Plans and into On-Going and Future Programmes of Work under the Convention on Biological Diversity (CBD). Annex II lists information on measures to regulate or manage processes or activities that represent a significant adverse effect on migratory species and provides details of relevant impact assessment measures designed to avoid or minimize adverse impacts of proposed projects on migratory species. *Potential threats from power transmission lines and wind farms* are listed among the categories of information on migratory species to be considered in the development of a national biodiversity strategy and action plan under the CBD. In addition, CMS Resolution 8.22, Adverse Human Induced Impacts on Cetaceans, acknowledges that human induced impacts on cetaceans are increasing.<sup>17</sup>

EUROBATS, one of the agreements under the CMS, also has devoted a specific resolution to wind turbines. Like CMS Resolution 7.5, EUROBATS Resolution No. 4.7 (Wind Turbines and Bat Populations) adopted by the EUROBATS Meeting of the Parties (MOP) recognizes the environmental benefits of wind energy.<sup>18</sup> It notes, however, that the actual effects on bats of potential large-scale development of wind turbines have not yet fully been assessed or predicted and that there is existing evidence of mortalities of bats from wind turbines.<sup>19</sup>

The possible negative impacts of wind turbines on bat populations, their prey and habitats identified under EUROBATS Resolution 4.7 are as follows:

- Destruction and disturbance of habitats and commuting corridors;
- Destruction and disturbance of roosts;
- Increased collision risk for bats in flight; and
- Risks from emission of ultrasound noise.<sup>20</sup>

In light of the limited data available on bat populations potentially affected by wind turbines and the wish to minimize the possible adverse effects of such

<sup>16</sup> See action no. 2.31.10 and its corresponding indicators and milestones, Draft Strategy Implementation Plan 2006-2011 of the CMS Scientific Council, available at [http://www.cms.int/bodies/ScC/13th\\_scientific\\_council/pdf/en/ScC13\\_Doc\\_03\\_Draft\\_Strategy\\_ImpPlan\\_2006\\_2011\\_E.pdf](http://www.cms.int/bodies/ScC/13th_scientific_council/pdf/en/ScC13_Doc_03_Draft_Strategy_ImpPlan_2006_2011_E.pdf). A copy of said draft guidelines are currently not available online.

<sup>17</sup> 11<sup>th</sup> prefatory clause.

<sup>18</sup> Resolution No. 4.7, Wind Turbines and Bat Populations, Annex 10 to the Record of the 4th Session of the Meeting of Parties Sofia, Bulgaria, 22 – 24 September 2003 available at [http://www.eurobats.org/documents/pdf/MoP4/Record\\_MoP4\\_complete.pdf](http://www.eurobats.org/documents/pdf/MoP4/Record_MoP4_complete.pdf)

<sup>19</sup> *Id.*, 5th and 6th prefatory clauses.

<sup>20</sup> *Id.*, 7th prefatory clause.

developments on bat populations, the EUROBATS MOP has requested its Advisory Committee to assess the evidence of the impacts of wind turbines on bat populations and, if appropriate, to develop guidelines for assessing the potential impacts on bats and for the erection of wind turbines in accordance with the ecological requirements of bat populations.<sup>21</sup>

The Advisory Committee's Inter-sessional Working Group (IWG) on Wind Turbines and Bat Populations presented draft guidelines for the planning of wind farms, including the assessment of sites where wind turbines can be placed, at the Advisory Committee's 11<sup>th</sup> meeting held in Luxembourg from 8 to 10 May 2006.<sup>22</sup> Comments on the draft guidelines were requested by 15 June 2006,<sup>23</sup> and a final version of the guidelines was presented to the fifth meeting of the EUROBATS MOP held in Slovenia from 4 - 6 September 2006.<sup>24</sup>

The IWG report and guidelines have been annexed to EUROBATS *Draft* Resolution 5.6 – Wind Turbines and Bat Populations.<sup>25</sup> The Preamble of the *Draft* Resolution begins by '[n]oting the importance that wind energy has in the implementation of the Kyoto protocol to reduce CO2 emissions in context of combating climate change'. The substantive provisions of the Draft Resolution urge Parties and Range States to:

1. Raise awareness of the impacts that wind turbines might have on bat populations;
2. Raise awareness of the existence of some unsuitable habitats or sites for the construction of wind turbines at a local, regional and national scale;
3. Make developers of wind energy plants aware of the necessity of supporting research and monitoring;
4. Recognise the necessity to find suitable methods for assessing bat migration corridors;
5. Adopt and implement the document "Wind Turbines and Bats: Guidelines for the planning process and impact assessment" attached as Annex 1.<sup>26</sup>

The primary purpose of these guidelines is to raise awareness among developers and planners of the need to consider bats and their roosts, their migration routes and feeding areas when they are assessing applications for wind turbines.<sup>27</sup> The guidelines are meant to be voluntary and assist in the planning and impact assessment

---

<sup>21</sup> *Id.*, paragraph 1.

<sup>22</sup> Doc.EUROBATS.AC11.15.Rev.1, *available at*,

[http://www.eurobats.org/documents/pdf/AC11/Doc\\_AC11\\_15\\_Rev1\\_ReportWindturbines.pdf](http://www.eurobats.org/documents/pdf/AC11/Doc_AC11_15_Rev1_ReportWindturbines.pdf).

<sup>23</sup> See 11th Meeting of the Advisory Committee City of Luxembourg, Luxembourg, 8 – 10 May 2006

Record of the Meeting (EUROBATS.AC11.Record) p. 12, *available at*,

[http://www.eurobats.org/documents/pdf/AC11/AC11\\_Record.pdf](http://www.eurobats.org/documents/pdf/AC11/AC11_Record.pdf)

<sup>24</sup> See Annex II of the Record of the Meeting of the 10th meeting of the EUROBATS Advisory

Committee (EUROBATS.AC10.Record.Annex2), *available at*,

[http://www.eurobats.org/documents/pdf/AC10/AC10\\_Record\\_Annex2\(IWGreports\).pdf](http://www.eurobats.org/documents/pdf/AC10/AC10_Record_Annex2(IWGreports).pdf)

<sup>25</sup> Doc.EUROBATS.MoP5.12, *available at*,

[http://www.eurobats.org/documents/pdf/MoP5/PDF/Doc\\_MoP5\\_12\\_DraftRes5\\_6\\_Rev\\_1\\_WindTurbines.pdf](http://www.eurobats.org/documents/pdf/MoP5/PDF/Doc_MoP5_12_DraftRes5_6_Rev_1_WindTurbines.pdf).

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

processes to reduce the impact of wind turbines on bats. The publication of Resolution 5.6 in its final form is expected later in 2006.

These guidelines also have been identified by the IWG as a potential contribution by EUROBATS to the CBD/CMS Joint Work Programme (JWP) from 2006 onwards. Thus, the JWP, which was welcomed by the Conference of the Parties to the CBD at its eighth meeting in March 2006, could be the vehicle by which the applicability of whatever guidelines are adopted by EUROBATS could be extended to a significantly larger group of parties.<sup>28</sup>

Until the task of developing guidelines is completed, parties and Range States<sup>29</sup> are asked to take full account of the precautionary principle in the development of wind farms and to take account of bats in planning processes relating to the siting of wind turbines, especially along migration routes and in areas of particular value to bat populations.<sup>30</sup> Parties and non-party Range States are also encouraged to initiate and support further investigations and research on the impacts of wind turbines on bats.<sup>31</sup>

#### Analysis of 'Barriers'

The first question to be asked is whether the provisions of the resolutions described above form barriers to the development of wind energy. If these provisions are considered barriers, then the next question is whether they are *unreasonable* barriers. Finally, we must ask how these barriers can be reconciled with the challenge of fully harnessing the potential of wind energy as an alternative to fossil fuel generation.

In most instances, the text of biodiversity-related multilateral agreements and instruments and the decisions, resolutions or recommendations adopted by their decision-making bodies do not pose a *direct* barrier to the development of wind energy. It is generally the implementation of the obligations under these instruments (i.e. the concrete policies and measures adopted by parties carrying out these obligations) that can create potential barriers to the development of wind energy. The mixture of policies and measures adopted by a country in implementing an international agreement will depend on that country's particular circumstances. Therefore, it is difficult to generalize about the positive and negative effects of an international agreement at the national level.

However, it should be noted that the wording of the wind farm-related provisions in both the CMS and EUROBATS resolutions is very general in nature. Thus, when it comes to implementation, parties will have some latitude in interpreting their obligations under either the CMS or EUROBATS, especially relative to other policy considerations and obligations under other international, regional or bilateral

<sup>28</sup> As at 1 December 2005, EUROBATS had 31 Parties out of its 48 Range States. As at 31 January 2006, the CBD had 188 Parties. It should be noted, however, that COP 8 restricts the collaboration amongst parties of the CMS and CBD. Only those countries party to both conventions are invited to collaborate.

<sup>29</sup> These are defined as "any State (whether or not it is a Party to the Convention [CMS]) that exercises jurisdiction over any part of the range of a species covered by this Agreement." Article 1(c), EUROBATS. Annex I contains the bat species occurring in Europe to which the Agreement applies.

<sup>30</sup> *Id.*, paragraph 2.

<sup>31</sup> *Id.*, paragraph 3.

agreements. Without the benefit of clarifying guidelines, which, in the case of the CMS, may not be available until 2008, the potential for uneven application of the wind farm provisions among parties may give rise to uncertainty. This uncertainty could be minimized by a call for parties to provisionally apply any guidelines developed by the Scientific Council in the period before the next session of the COP.

Careful review and involvement by all stakeholders is particularly necessary during the development of the specific language of the guidelines implementing the CMS and EUROBATS agreements. Unduly burdensome guidelines may create barriers to wind energy development if they are adopted in national policies by Member nations.

Based on arguments raised by opponents to wind farms in several national siting controversies, it can be expected that certain language that seems balanced on its face could be construed by such opponents to impede wind energy development. Therefore, the wording of guidelines developed under CMS Resolution 7.5 and EUROBATS Resolution 4.5 should be carefully crafted with the full recognition of this fact.

In order to avoid unreasonable barriers to wind energy, development of concrete implementing guidelines for CMS Resolution 7.5 should involve input from all relevant stakeholders, including not only environmental groups and wildlife experts from academia and government but also the wind industry. The specific language included in guidelines to implement the following provisions of the two resolutions is particularly important:

- “evaluation of possible negative ecological impacts of wind turbines on nature, particularly migratory species, prior to deciding upon permission for wind turbines” (emphasis added);
- “assessment of the cumulative environmental impact of installed wind turbines on migratory species;” and
- “taking full account of the precautionary principle in the development of wind turbine plants.”

In addition, if vague or ambiguous language, such as that contained in the actual resolutions, is contained in the final guidelines, such language can expose wind developers to substantial delays and uncertainties and increased costs in permitting projects. For example, wind developers can be expected to argue that the precautionary principle favors the adoption of wind generation because it safeguards the global environment from greenhouse gas emissions even though the complete local environmental consequences of such wind generation are not fully known. However, opponents of wind energy have cited the same language of the precautionary principle to argue for regional moratoriums on the construction of any individual wind farms until comprehensive regional studies and comprehensive studies of the cumulative environmental impact of multiple wind farms can be completed.

In other words, some wind farm opponents have urged national and state governments to reject permit approvals for any and all wind farms until extensive additional study is completed on avian and wildlife impacts. Some have asserted that

site-specific pre-construction and post-construction monitoring is not adequate, and others have argued for an assessment of the cumulative negative impacts of wind generation without a balanced assessment of cumulative positive benefits, including reduced greenhouse gas emissions from multiple wind farms.

The implications of a broad interpretation of cumulative impacts are highlighted by a June 30, 2006 letter from the Virginia Department of Environmental Quality (DEQ). In this letter, DEQ provides recommendations to the permitting agency on the Highland New Wind Development project -- a proposed 39 MW wind farm consisting of up to 20 turbines in the Allegheny Highlands. In the letter, the DEQ recommends the conduct of a cumulative impact analysis as a prerequisite to the approval of the individual project. According to the environmental agency, such a cumulative impact would consider "the cumulative impact of "wind turbines proposed or planned at 34 facilities within the Allegheny Highlands of Virginia, West Virginia, Maryland, and Pennsylvania."<sup>32</sup> This impact analysis would need to encompass not only the applicant's own project but also 88 currently operating wind turbines, 457 permitted wind turbines, and 480 utility-scale wind turbines proposed or planned at these 34 facilities.<sup>33</sup>

According to one of the comments filed in this permitting proceeding, "this cumulative impact assessment would require the public utility commission to consider, among other things, *what might occur in the future* at nearly three dozen wind power projects in three jurisdictions (West Virginia, Maryland, and Pennsylvania) before issuing a CPCN [Certificate of Public Convenience and Necessity] for a single proposed project... in the Commission's jurisdiction."<sup>34</sup> This commenter further points out that the applicant would face the task of obtaining "permission from the dozens, if not hundreds, of property owners involved (including competitors in the wind industry) to adequately sample even a very small number of the presumably thousands of acres of property involved" for an untold number of species impacts. He concludes that such a cumulative impact assessment would be "neither legally nor commercially feasible" to perform.<sup>35</sup>

Another important question relates to the issue of the acceptable threshold. There is a critical difference between the goal of "zero mortality" of birds, bats and other wildlife affected by wind turbines (e.g., "prevention" of any adverse impacts) and a goal of assuring the "mitigation" of adverse impacts on wildlife through the implementation of "best practices." Of course, the latter option would involve tolerance of a certain level of mortality.

The authors urge that the "mitigation"/"best practices" approach should be adopted rather than an approach based on "zero-tolerance" or the prevention of any and all adverse impacts. In many circumstances, known measures are available to mitigate the impact of wind farms on migratory species. These "best practices"

---

<sup>32</sup> Letter from Michael Murphy, Director, Division of Environmental Enhancement, Virginia Department of Environmental Quality, to Joel H. Peck, Virginia State Corporation Commission, June 30, 2006 (Case No. PUE-2005-00101). See <http://docket.scc.virginia.gov:8080/vaprod/main.asp>

<sup>33</sup> *Ibid.*

<sup>34</sup> Letter from Michel King to Joel H. Peck, Virginia State Corporation Commission, July 13, 2006. (Case No. PUE-2005000101). See <http://docket.scc.virginia.gov:8080/vaprod/main.asp>

<sup>35</sup> *Ibid.*

involve approaches that seek to minimize adverse impacts on avian species and wildlife through actions, such as careful siting based on pre-construction studies, retrofitting of power poles to prevent electrocution of birds, construction of turbines on taller towers (above flight paths), re-powering of older sites to use fewer (but more efficient) turbines, and the emission of audible signals to birds and other species.

### III. Potential Impact of Other International Instruments on Wind Energy Development

While the CMS and the EUROBATS agreements are the only two biodiversity-related agreements which specifically consider wind farms in relation to the protection and conservation of species, a number of more general provisions in other international legal instruments also may directly impact the development of wind energy resources. This section surveys these instruments, which are organised under three broad headings:

- (1) protection and conservation of species;
- (2) protection and conservation of habitats; and
- (3) assessment of impacts.

It should be noted that this analysis will not consider those international agreements which may impact offshore wind installations outside of the three instruments agreed under the auspices of the CMS.<sup>36</sup>

#### Protection and Conservation of Species

The following biodiversity-related agreements, including three concluded under the auspices of the CMS, have provisions that could significantly impact the development of wind energy.

#### *Convention on Biological Diversity (CBD, 1992)*

The CBD is the central biodiversity-related agreement in the international arena. It was signed in 1992 at the United Nations Convention on Environment and Development in Rio de Janeiro along with the conventions on climate change and desertification. One of the CBD's primary objectives is the conservation of biological diversity,<sup>37</sup> which is accomplished either through in-situ<sup>38</sup> or ex-situ<sup>39</sup> means. One of

---

<sup>36</sup> For a comprehensive analysis of international instruments relevant to offshore wind installations, see S. Shaw, M.J. Cremers, G. Palmers, 'Enabling Offshore Wind Developments' (European Wind Energy Association - Brussels 2002). This report is often called the 'Sealegal' Report. In addition, work on marine and renewable energy issues is being completed separately under the auspices of the Renewable Energy and International (REIL) Project.

<sup>37</sup> CBD, art 1, available at [www.biodiv.org](http://www.biodiv.org).

<sup>38</sup> 'In-situ conservation' is defined as the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties. CBD, art 2. The obligations of parties in respect of in-situ conservation are set out in CBD, art 8.

<sup>39</sup> 'Ex-situ conservation' the conservation of components of biological diversity outside their natural habitats. CBD, art 2. The obligations of parties in respect of ex-situ conservation are set out in CBD,

the tools for achieving in-situ conservation is the establishment of protected areas. These will be discussed further in the subsection that follows. The CBD has impact assessment requirements<sup>40</sup> as well, which also are discussed below.

Parties to the CBD are required to integrate the conservation and sustainable use of biodiversity into relevant sectoral or cross-sectoral plans, programmes and policies.<sup>41</sup> Parties also are required to integrate the conservation and sustainable use of biological diversity into national decision-making processes.<sup>42</sup> Such decision-making processes would include the energy sector, and this is one way that the CBD could directly impact wind energy decisions.

The CBD has 'joined forces' with four other biodiversity-related conventions to explore the inter-linkages between the issues each addresses, and the potential complementary aspects of their monitoring and implementation processes.<sup>43</sup> At COP 8 in March 2006 in Brazil, the CBD welcomed the revised joint work programme with the CMS (2006-2008). To the extent that the joint work programme results in the incorporation of CMS initiatives into national biodiversity strategies and action plans, it could provide an entry point for CMS guidelines on migratory species and wind farms.

#### ***Ramsar Convention on Wetlands*** (Ramsar Convention, 1971)

The Ramsar Convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It is the only global environmental treaty that deals with a particular ecosystem. Parties to the Convention are spread geographically across the globe.<sup>44</sup> This global coverage is available because the definition of wetlands used by the Ramsar Convention is very broad, and this definition includes swamps and marshes, lakes and rivers, wet grasslands and peat lands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites, such as fish ponds, rice paddies, reservoirs, and salt pans.<sup>45</sup>

Although the Ramsar Convention may be viewed primarily as a habitat conservation treaty, the fundamental importance of wetlands as habitats for waterfowl is considered in the Preamble, and the international importance of wetlands to waterfowl is one of the key criteria for designating wetlands for protection.<sup>46</sup> According to the treaty, if a listed wetland is deleted or restricted in the national

---

art 9, which states explicitly in the chapeau that ex-situ measures serve to complement in-situ measures.

<sup>40</sup> CBD, art 14: Impact Assessment and Minimizing Adverse Impacts.

<sup>41</sup> CBD, art 6(b).

<sup>42</sup> CBD, art 10(a).

<sup>43</sup> See Joint Web Site of the Biodiversity Related Conventions, available at, <http://www.biodiv.org/cooperation/joint.shtml>. The five biodiversity-related conventions are the Convention on Biological Diversity (CBD), the Convention on Conservation of Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention on Wetlands (Ramsar Convention) and the World Heritage Convention (WHC).

<sup>44</sup> See Ramsar Convention website, available at, <http://www.ramsar.org/>.

<sup>45</sup> Ramsar Convention, art 1.1, available at, [http://www.ramsar.org/key\\_conv\\_e.htm](http://www.ramsar.org/key_conv_e.htm). See also id.

<sup>46</sup> Ramsar Convention, art 2.1.

interest, compensation for any loss to wetland resources should be made, in particular for the protection of waterfowl.<sup>47</sup> Parties to Ramsar must endeavour to increase the population of waterfowl on appropriate wetlands.<sup>48</sup>

***Bern Convention on the Conservation of European Wildlife and Natural Habitats***  
(Bern Convention, 1979)

The aim of the Bern Convention is to ensure the conservation of wild flora and fauna and their natural habitats and to protect endangered migratory species through cooperation between contracting parties. Although the Bern Convention is primarily an instrument for the conservation of European biodiversity, it counts as parties four African nations,<sup>49</sup> and this agreement considers the protection of migratory species.<sup>50</sup>

In 2004 the Standing Committee of the Bern Convention adopted a recommendation,<sup>51</sup> which recalls both CMS Resolution 7.5 and EUROBATS Resolution 4.7, and recommends that parties take appropriate measures to minimize the potential adverse effects of wind turbines on wildlife.<sup>52</sup> The recommendation also asks parties to improve their understanding of the impact of wind farms on wildlife by involving the wind energy sector.<sup>53</sup> Observer states also are invited to take note of and implement the recommendation.<sup>54</sup>

***Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas Convention for Cetaceans*** (ASCOBANS, 1992)

ASCOBANS was concluded under the auspices of the CMS, but it is a free-standing international agreement. The agreement covers all species, subspecies or populations of small cetaceans in the Baltic Sea and North Sea, with the exception of the sperm whale. The area covered by the agreement consists of the marine environment of fifteen Range States, including the European Community, around the shores of the Baltic and North Seas. The parties to the agreement have agreed to extend the coverage area to cover parts of the North Atlantic and to incorporate waters adjacent to Ireland, Portugal, and Spain. The extension will close the gap for some species of small cetaceans between the ASCOBANS and its sister agreement, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS).<sup>55</sup>

---

<sup>47</sup> Ramsar Convention, art 4.2.

<sup>48</sup> Ramsar Convention, art 4.4.

<sup>49</sup> Burkina Faso, Morocco, Senegal and Tunisia.

<sup>50</sup> See information on the Bern Convention on the Council of Europe's website, available at, <http://www.coe.int/DefaultEN.asp>.

<sup>51</sup> Recommendation No. 109 (2004) on minimising adverse effects of wind power generation on wildlife: advises contracting parties to take appropriate measures to minimise the negative impact of wind turbines in wildlife, available at, <http://www.coe.int/>.

<sup>52</sup> *Id.*

<sup>53</sup> *Id.*

<sup>54</sup> Observer states include Algeria, Belarus, Cape Verde, the Holy See, Kazakhstan, Kyrgyzstan, Mauritania, Tajikistan, Turkmenistan and Uzbekistan. See Documents of the Bern Convention, available at, <http://www.coe.int/>.

<sup>55</sup> See the ASCOBANS webpage, available at, [http://www.cms.int/species/ascobans/asc\\_bkrd.htm](http://www.cms.int/species/ascobans/asc_bkrd.htm). For a discussion of ACCOBAMS, see the following section of this paper.

ASCOBANS includes a Conservation and Management Plan that describes the conservation, research, and management measures that should be applied by the parties to the agreement. Paragraph 1 of the Plan requires parties to work towards the reduction of activities which may affect the food resources of the cetaceans covered by the agreement, and to prevent other significant disturbances, especially those of an acoustic nature.<sup>56</sup> While no formal text has been adopted yet by the parties, concerns over the effects of noise on cetaceans have been expressed.<sup>57</sup> Wind farms operate in marine areas covered by a number of the parties to the ASCOBANS agreement, and further elaboration of the Plan could affect future offshore wind farm development.

***Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area*** (ACCOBAMS, 1996)

ACCOBAMS, another of the agreements concluded under the auspices of the CMS, applies to all cetaceans that have a range that lies entirely or partly within the area covered by the agreement or that accidentally or occasionally frequent that area. Unlike ASCOBANS, ACCOBAMS protects both large and small cetaceans, including the sperm whale, the fin whale, and the long-finned pilot whale.

The area covered by the agreement encompasses the Black Sea, the Mediterranean Sea, and the Atlantic coasts of Morocco and Portugal. There are twenty-eight Range States included in this area. It is important to note that membership in the agreement is also open to non-coastal or 'third party' States whose vessels are engaged in activities that may affect cetaceans within the area covered by the agreement.<sup>58</sup>

While the primary focus of ACCOBAMS is the deliberate and incidental taking of cetaceans in the area by fishing vessels, its overall aim is to conserve all cetaceans in the area's waters by reducing threats to their existence. To this end, parties to ACCOBAMS are obligated to cooperate in the creation and maintenance of a network of cetacean conservation areas.<sup>59</sup> These protected areas are to be established within the framework of the Convention for the Protection of the Mediterranean Sea against Pollution<sup>60</sup> or within the framework of other appropriate instruments.<sup>61</sup>

***African-Eurasian Waterbird Agreement*** (AEWA, 1995)

Developed under the auspices of the CMS, like ASCOBANS and ACCOBAMS, AEWA is an independent international treaty. AEWA covers 235 species of birds ecologically dependent on wetlands for at least part of their annual

<sup>56</sup> ASCOBANS, Annex, ¶1, available at, [http://www.cms.int/species/ascobans/asc\\_text.htm](http://www.cms.int/species/ascobans/asc_text.htm).

<sup>57</sup> Resolution n. 5: Effects of noise and of vessels, Meeting of the Parties at Esbjerg, Denmark, Aug 2003

<sup>58</sup> See websites for both ACCOBAMS, available at, <http://www.accobams.org/> and the overarching CMS agreement, available at, [http://www.cms.int/species/accobams/acc\\_bkrd.htm](http://www.cms.int/species/accobams/acc_bkrd.htm).

<sup>59</sup> ACCOBAMS, art II.1, available at, [http://www.cms.int/species/accobams/acc\\_text.htm](http://www.cms.int/species/accobams/acc_text.htm).

<sup>60</sup> Otherwise known as the UNEP Barcelona Convention. The relevant protocol to this Convention is called Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean which was adopted on 10 June 1995. The protocol is available at, [http://www.unepmap.org/Archivio/All\\_Languages/WebDocs/BC&Protocols/SPA95\\_eng.pdf](http://www.unepmap.org/Archivio/All_Languages/WebDocs/BC&Protocols/SPA95_eng.pdf).

<sup>61</sup> ACCOBAMS, Annex II ¶3, available at, [http://www.cms.int/species/accobams/acc\\_cp.htm](http://www.cms.int/species/accobams/acc_cp.htm)

cycle over an area of 117 countries from Europe, parts of Asia and Canada, the Middle East, and Africa. It provides for coordinated and concerted action to be taken by the Range States throughout the migration system of the waterbirds to which it applies.<sup>62</sup>

The fundamental principles of the agreement require parties to take coordinated measures to maintain migratory waterbird species in a favourable conservation status or to restore them to such a status on the basis of the precautionary principle.<sup>63</sup> The Action Plan accompanying the agreement<sup>64</sup> specifically requires parties to 'promote high environmental standards in the planning and construction of structures' and to 'consider steps to minimize the impact of structures already in existence.'<sup>65</sup> Parties also should 'endeavour to take measures to limit the level of threat' caused by human disturbances. 'Appropriate measures might include...the establishment of disturbance-free zones in protected areas where public access is not permitted.'<sup>67</sup>

### **Protection and Conservation of Habitats**

Most biodiversity-related agreements or provisions consider the protection and conservation of habitats as critical to ensuring against biodiversity loss. Even where the preservation of habitats is not the primary aim of an agreement, it is used as a tool for the protection and conservation of species.

### ***Convention on Biological Diversity (CBD, 1992)***

The conservation of habitats is provided for in article 8 (In-situ Conservation) of the CBD. One of the key tools for achieving the in-situ conservation of biodiversity is the establishment of a system of protected areas.<sup>68</sup> Where necessary, parties are to develop guidelines for the selection, establishment, and management of protected areas,<sup>69</sup> and they must regulate the conservation and sustainable use of biological diversity whether inside or outside the protected area.<sup>70</sup> Parties have a duty to promote sustainable practices in areas adjacent to protected areas to guard against spillover effects.<sup>71</sup>

CBD COP decision VII/28<sup>72</sup> on protected areas (in tandem with decision VII/5<sup>73</sup> on marine and coastal biodiversity) reaffirms the importance of protected areas to attaining the objectives of the convention. At its eighth meeting in Curitiba,

<sup>62</sup> See AEWa website, available at, <http://www.unep-awea.org/>.

<sup>63</sup> AEWa, art II, available at, [http://www.unep-awea.org/documents/agreement\\_text/eng/agree/agree\\_text.htm](http://www.unep-awea.org/documents/agreement_text/eng/agree/agree_text.htm).

<sup>64</sup> AEWa, Annex 3, available at, [http://www.unep-awea.org/documents/agreement\\_text/eng/agree/ag\\_a3.htm](http://www.unep-awea.org/documents/agreement_text/eng/agree/ag_a3.htm).

<sup>65</sup> AEWa, Annex 3, item 4.3.5.

<sup>67</sup> *Id.*

<sup>68</sup> CBD, art 8(a).

<sup>69</sup> *Id.* at 8(b).

<sup>70</sup> *Id.* at 8(c).

<sup>71</sup> *Id.* at 8(e).

<sup>72</sup> CBD COP 7 decision VII/28: Protected areas (articles 8(a) to (e)), available at, <http://www.biodiv.org/decisions/default.asp>.

<sup>73</sup> CBD COP 7 decision VII/5: Marine and coastal biological diversity, *id.*

Brazil in March 2006, the COP re-affirmed the importance of the protected areas programme of work and recognised the need for adequate technical, institutional and financial capacities for the implementation of the programme.<sup>74</sup>

***Ramsar Convention on Wetlands*** (Ramsar Convention, 1971)

The main aim of the Ramsar Convention is habitat protection, and more specifically, the conservation and wise use of wetland habitats.<sup>75</sup> Wise use is defined as 'sustainable utilization for the benefit of mankind in a way compatible with the maintenance of the natural properties of the ecosystem.'<sup>76</sup> 'Sustainable utilization' is understood to mean 'human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations'.<sup>77</sup>

Wetlands are protected through a listing process. Parties designate wetlands to be listed on the basis of their international significance. International significance is determined using the following criteria: ecology, botany, zoology, limnology, or hydrology.<sup>78</sup> Changes to listed wetlands must be reported, including those resulting from technological developments, pollution, or other human interference.<sup>79</sup> Where possible, parties must compensate for losses to wetland resources.<sup>80</sup>

***Bern Convention on the Conservation of European Wildlife and Natural Habitats*** (Bern Convention, 1979)

The Bern Convention, is essentially a European treaty, and it is implemented through the European Community's (EC) Birds<sup>81</sup> and Habitats<sup>82</sup> Directives. The Birds Directive provides for habitat protection by establishing the requirement for EC Member States to designate special protection areas (SPAs).<sup>83</sup> The corresponding areas in the Habitats Directive are known as special areas of conservation (SACs).<sup>84</sup> The combination of SPAs and SACs across Europe make up the Natura 2000 network, which is considered the cornerstone of EU nature protection policy.<sup>85</sup> Exceptions exist in both directives which allow for development to occur within the Natura 2000 protection network.<sup>86</sup>

<sup>74</sup> See CBD COP 8 decision VIII/24: Protected areas, available at, <http://www.biodiv.org/decisions/default.asp?m=cop-08>.

<sup>75</sup> Ramsar, art 3.1, available at, [http://www.ramsar.org/key\\_conv\\_e.htm](http://www.ramsar.org/key_conv_e.htm).

<sup>76</sup> See 'Guidelines for the Implementation of the Wise Use Concept', first adopted as an annex to Recommendation 4.10 of the 4th Meeting of the Conference of the Contracting Parties (Montreux, Switzerland, 1990), available at, [http://www.ramsar.org/key\\_guide\\_wiseuse\\_e.htm](http://www.ramsar.org/key_guide_wiseuse_e.htm).

<sup>77</sup> *Id.*

<sup>78</sup> Ramsar, art 2.2.

<sup>79</sup> *Id.* at art 3.2.

<sup>80</sup> *Id.* at art. 4.2.

<sup>81</sup> Directive 79/409/EEC, available at, <http://europa.eu.int/comm/environment/nature/home.htm>.

<sup>82</sup> Directive 92/43/EEC, *id.*

<sup>83</sup> Birds Directive, art 4.

<sup>84</sup> Habitats Directive, art 4.4.

<sup>85</sup> See European Commission DG Environment website, available at, [http://europa.eu.int/comm/environment/nature/mission\\_statement/index\\_en.htm](http://europa.eu.int/comm/environment/nature/mission_statement/index_en.htm).

<sup>86</sup> Habitats Directive, arts 6 and 7.

***African-Eurasian Waterbird Agreement*** (AEWA, 1995)

AEWA allows parties to take the same actions as those allowed by the CMS in protecting listed endangered species.<sup>87</sup> This action includes the conservation and restoration of critical habitats.<sup>88</sup> It also includes the prevention and removal of obstacles to migration of these species.<sup>89</sup> Given AEWA's direct tie to the conservation provisions of the CMS, it may not be unreasonable to presume that CMS guidelines regarding wind farms would be paid serious attention.

The AEWA Action Plan requires parties to endeavour to establish protected areas to conserve habitats important for listed populations and to develop and implement management plans for these areas.<sup>90</sup>

***Assessment of Impacts***

Pre-project assessment requirements may impact the ability of wind farm developers to receive planning permission.

***Convention on Biological Diversity*** (CBD, 1992)

The CBD requires parties to introduce environmental assessment procedures for proposed projects that may have adverse impacts on biodiversity, to the extent possible and where appropriate.<sup>91</sup> The convention also requires that the potential negative impacts of programmes and policies should be considered.<sup>92</sup> Activities taken by one party that may adversely affect the biodiversity of another party are subject to notification, information exchange, and consultation as agreed by the parties,<sup>93</sup> and where the actions of one party put the biodiversity of another party in imminent harm or danger, a system for immediate notification and mitigation must be in place.<sup>94</sup> Measures for dealing with national emergencies also should be in place, and parties should encourage international cooperation as a supplement to national efforts.<sup>95</sup> Parties to the CBD are required to examine the issue of redress and liability.<sup>96</sup>

***Espoo Convention on Environmental Impact Assessment in a Transboundary Context*** (Espoo Convention, 1991)

Parties to the Espoo Convention have a duty to assess the environmental impact of certain activities at an early stage of planning. The convention also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.<sup>97</sup>

<sup>87</sup> AEWA, art 3.2(a), available at, [http://www.cms.int/species/aewa/aew\\_text.htm](http://www.cms.int/species/aewa/aew_text.htm).

<sup>88</sup> CMS, art 3.4(a), available at, [http://www.cms.int/documents/convtxt/cms\\_convtxt.htm](http://www.cms.int/documents/convtxt/cms_convtxt.htm).

<sup>89</sup> *Id.* at art 3.4.(b).

<sup>90</sup> AEWA, Annex 3, item 3.2.1, available at, [http://www.cms.int/species/aewa/aew\\_ap.htm](http://www.cms.int/species/aewa/aew_ap.htm).

<sup>91</sup> CBD, art 14.1(a), available at, <http://www.biodiv.org/convention/articles.asp?lg=0&a=cbd-14>.

<sup>92</sup> *Id.* at art 14.1(b).

<sup>93</sup> *Id.* at art 14.1(c).

<sup>94</sup> *Id.* at art 14.1(d).

<sup>95</sup> *Id.* at art 14.1(e).

<sup>96</sup> *Id.* at art 14.2.

<sup>97</sup> See Espoo Convention website, available at, <http://www.unece.org/env/eia/eia.htm>.

For those activities listed in Appendix I to the convention, parties must establish environmental impact assessment procedures that permit public participation.<sup>98</sup> The assessment documentation must be prepared as set out in Appendix II to the convention.<sup>99</sup> The list of activities in Appendix I includes 'major installations for the harnessing of wind power for energy production (wind farms).'<sup>100</sup> The assessment documentation must include at a minimum the following information:

- (a) A description of the proposed activity and its purpose;
- (b) A description, where appropriate, of reasonable alternatives (for example, locational or technological) to the proposed activity and also the no-action alternative;
- (c) A description of the environment likely to be significantly affected by the proposed activity and its alternatives;
- (d) A description of the potential environmental impact of the proposed activity and its alternatives and an estimation of its significance;
- (e) A description of mitigation measures to keep adverse environmental impact to a minimum;
- (f) An explicit indication of predictive methods and underlying assumptions as well as the relevant environmental data used;
- (g) An identification of gaps in knowledge and uncertainties encountered in compiling the required information;
- (h) Where appropriate, an outline for monitoring and management programmes and any plans for post-project analysis; and
- (i) A non-technical summary including a visual presentation as appropriate (e.g., maps, graphs).<sup>101</sup>

Even where wind farm development is not deemed a 'major installation,' it still may be subject to an environmental impact assessment by virtue of its size, location, or effect.<sup>102</sup> For the purposes of this analysis, the proximity of a project to an international border should be taken into consideration.<sup>103</sup> While environmental impact assessments are to be applied at the project level, parties should endeavour to apply the same measures to policies, plans, and programmes.<sup>104</sup>

---

<sup>98</sup> Espoo Convention, art 2.2, available at, <http://www.unece.org/env/eia/eia.htm#appendixI>.

<sup>99</sup> *Id.*

<sup>100</sup> *Id.* at Appendix I, item 22.

<sup>101</sup> *Id.* at Appendix II.

<sup>102</sup> *Id.* at art 2.5 and Appendix III.

<sup>103</sup> *Id.* at Appendix III.

<sup>104</sup> *Id.* at art 2.7.

#### IV. Conclusions and Recommendations

International agreements to protect biodiversity and to reduce greenhouse gas emissions all pursue similar objectives – securing a sustainable future and reducing the impact of humans on natural values. However, the interpretations of these agreements can lead to contradictory results, particularly in the case of wind energy development. In some instances, there has been a disproportionate focus on the short-term negative impacts of wind development on biodiversity and an inadequate focus on the long-term benefits of wind energy in reducing the effects of climate change – one of the largest threats to biodiversity. In addition, in some cases, the impacts of wind energy – both positive and negative – have been viewed in isolation and have not been compared to the far more serious environmental impacts of producing electricity from other energy sources, particularly fossil fuel sources, including coal, oil, and natural gas, as well as nuclear power and large-scale hydropower plants.

Increased efforts should be focused on assuring a balanced approach that seeks to harmonize the goals of protecting biodiversity and reducing greenhouse gas emissions. This approach should seek to mitigate the negative, local impacts of wind turbines on biodiversity while avoiding policies that create serious impediments to well-designed and carefully sited wind farms. Without such a balanced approach, policies designed to protect biodiversity may actually contribute to continued reliance on conventional electric generating technology and the consequent aggravation of global climate change and pollution on wildlife and habitats on a large scale.

In pursuit of these objectives, wildlife experts, environmental organizations, and wind developers should collaborate in evaluating the issues raised by biodiversity agreements for the development of wind energy resources<sup>105</sup> and in developing guidelines to govern development. The following specific actions should be considered:

##### ***Planning:***

- National and regional authorities should develop and use Geographic Information System (GIS) tools to map environmentally sensitive areas as well as areas suitable for wind farm development and should make the maps readily accessible to the wind industry;
  - The planning process should be used to pinpoint specific locations of ecological concern and to demonstrate the sensitivities of particular locations to development;
  - Based on this mapping, national and regional authorities, following public consultation, should designate areas suitable for wind farm development (“go-areas) in their planning (as implemented in Denmark) rather than focusing solely on “no-go areas”;

---

<sup>105</sup> In 2005 the transportation and energy (DG TREN) and environment (DG ENV) directorates at the European Commission created an ad hoc working group on wind energy and biodiversity. The group is comprised of industry, governmental and non-governmental representatives. In August 2005, the European Wind Energy Association (EWEA), the group’s wind industry representative, issued a memorandum on findings, recommendations and conclusions. Copy on file with authors.

- The absence of such maps in the near-term should not be used as a barrier to development given the substantial time and effort requiring to conduct such mapping work.

**Research:**

- Research priorities relating to the environmental impacts of wind turbines and successful mitigation measures should be established on a collaborative basis by international agencies, National and State governments, academic experts, environmental organizations, and the wind industry, and this cooperative effort should result in a prioritized research “roadmap.”
- Increased funding should be made available to pursue the proposed research “roadmap,” and the results of such research should be peer-reviewed and made publicly available.

**Development of Guidelines:**

- The development of new environmental assessment guidelines for wind farms, including the guidelines under development pursuant to Resolution 7.5 of the Convention on Migratory Species and Wild Animals (CMS) and Resolution 4.7 of the Agreement on the conservation of Populations of European Bats, should:
  - Involve early and continuing input from all relevant stakeholders, including state regulatory experts, knowledgeable members of the environmental community, independent consulting biologists with expertise in the field, and the wind industry;
  - Avoid vague wording and general considerations based on limited site data;
  - Take advantage of the most up-to-date information about wind power development and its impact on wildlife and avoid reliance on studies based on outdated wind technology;
  - Rely on an evidence-based approach that focuses on what is known and clarifies the issues requiring further study;
  - Incorporate a mitigation/best practices approach rather than a zero-tolerance approach for reducing potential adverse impacts of wind farms, except where endangered or threatened species are involved. A mitigation/best practices approach is appropriate in recognition of the comparative benefits of wind farms compared to fossil fuel generation in reducing greenhouse gas emissions and the related adverse climate change impacts on the ecosystem;
  - Implement reasonable requirements for pre-construction and post-construction monitoring that:
    - Avoid requirements for pre-construction monitoring at comparative reference sites in view of the limited benefits and high costs of such requirements;
    - Recognize that excessive site-specific studies can render a particular project as infeasible and that certain studies are more appropriately directed as part of a broad-scale research agenda (rather than as part of a project -specific permit process) and pursued through a government-industry collaboration.

- Eliminate requirements for assessment of impacts on certain species if generic research has demonstrated no (or minimal) adverse impacts and the impacts are not site-specific; and
  - Seek to limit the adverse impact on projects already approved by national authorities;
- Any guidelines should contain provisions for periodic updating on the basis of new research and monitoring results.

The development of biodiversity guidelines affecting wind power development must be viewed in the context of multiple national, regional, and international commitments to preserve biodiversity, combat climate change, and to increase renewable energy use. With a balanced approach, States can ensure that they comply with their international obligations to preserve biodiversity, while developing clean, efficient and renewable sources of energy and reducing greenhouse gas emissions.