

### RECONCILING ENERGY DEVELOPMENT WITH THE CONSERVATION OF MIGRATORY SPECIES: AN ANALYSIS OF NATIONAL REPORTS TO CMS COP11 AND COP12

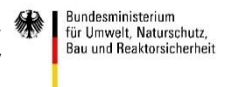
*(Prepared by BirdLife International for the Energy Task Force)*

**Summary:**

This paper provides an overview of the efforts and progress made by Parties to reconcile the deployment of renewable energy and powerlines with the conservation of migratory species of wild animals, in accordance with Resolutions 7.4, 7.5, 10.11 and 11.27. It has been informed by an analysis of the national reports submitted by Parties in 2017, in advance of the 12<sup>th</sup> Meeting of the Conference of the Parties, as well as national reports submitted in 2014.



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## 1. Background

Global energy demand is expected to increase 30% by 2040, largely from growth in developing countries (IEA, 2016).<sup>1</sup> Meeting this demand, while simultaneously curbing climate change, will require a significant increase in renewable energy technologies (RET) and associated infrastructure such as powerlines. While the deployment of RET can have positive impacts on migratory species by mitigating climate change, it can also have negative impacts if poorly planned.<sup>2</sup>

In recognition of the risks to migratory species from the deployment of renewable energy and associated infrastructure, Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) adopted *Resolution 7.4 Electrocutation of Migratory Birds*, *Resolution 7.5 Wind Turbines and Migratory Species*, *Resolution 10.11 Powerlines and Migratory Birds*, *Resolution 11.27 Renewable Energy and Migratory Species*. This Information Paper reviews the efforts taken by Parties to the CMS to implement these Resolutions, as reported by the Parties themselves through their national reports to the CMS Conference of the Parties (COP). It was developed by BirdLife International on behalf of the CMS Task Force on Reconciling Selected Energy Sector Developments with Migratory Species Conservation (the Energy Task Force).

## 2. Scope and outline

The paper is based on an analysis of the national reports<sup>3</sup> submitted in 2017 in preparation for the Twelfth Session of the Conference of the Parties to CMS (CMS COP12), as well as national reports submitted in 2014. At the time of analysis, 90 countries had submitted national reports to CMS in 2017, compared to 59 in 2014.

The analysis focusses on the threat posed by RET and powerline deployment, and efforts taken by countries to address these threats by implementing relevant CMS Resolutions (7.4, 7.5, 10.11, 11.27). While other threats such as poaching and habitat destruction are also important, and compound the threat posed by renewable energy and other infrastructure, they are beyond the scope of this paper. For an overview of these threats, and efforts made by Parties to implement other Resolutions, refer to documents UNEP/CMS/COP12/Doc.19.1 and UNEP/CMS/COP12/Inf.30. The paper considers all taxa and RET, however, some taxa and RET may receive wider coverage in the reports due to the specific focus of the relevant CMS Resolutions and the later adoption of Resolution 11.27.

This paper first examines and discusses the extent to which RET and associated infrastructure has been identified as an obstacle to Appendix 1 species, and proceeds with an analysis of efforts made to address these threats. The paper then discusses the barriers to the implementation of the COP Resolutions, drawing also on inputs from the members of the Energy Task Force during the first meeting, held in Cape Town, South Africa, in December 2016.

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<sup>1</sup> IEA (2016), *World Energy Outlook 2016*, IEA, Paris.

<http://dx.doi.org/10.1787/weo-2016-en>

<sup>2</sup> Van der Winden, J., F. van Vliet, C. Rein, and B. Lane (2014), *Renewable Energy Technology Deployment and Migratory Species: an Overview*, commissioned by: International Renewable Energy Agency, Convention on Migratory Species, African-Eurasian Waterbird Agreement and Birdlife International, UNDP/GEF/Birdlife MSB project

<sup>3</sup> All reports are available online at <http://www.cms.int/en/documents/national-reports>

### 3. Renewable energy and powerlines as obstacles to Appendix I migratory species

The national report framework asks Parties to indicate obstacles to migratory species (section 1.1). Possible responses related to the implementation of Resolutions 7.04, 7.05, 10.11, and 11.27 are ‘electrocution’ and ‘wind turbines’.

Of the ninety reports submitted in 2017, 48% (43 Parties), explicitly indicated that electrocution is an obstacle to Appendix 1 migratory species in their country, while 39% (35 Parties), reported that wind turbines are an obstacle. Thirty-nine percent (35 Parties) did not identify either as obstacles.

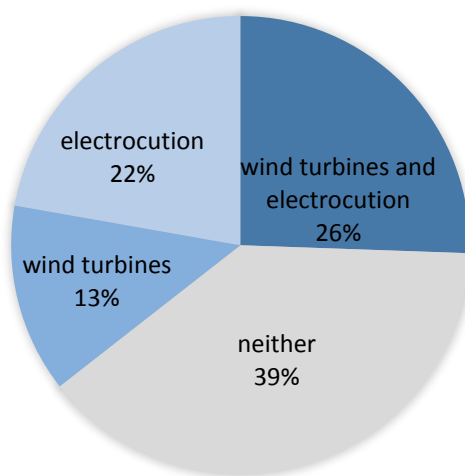


Figure 1: Percentage of Parties identifying wind turbines and electrocution as obstacles to migratory species in 2017 national reports.

Fifty Parties submitted reports in both 2014 and 2017.<sup>4</sup> Of these, only 5 Parties identified additional obstacles in 2017 compared to 2014, and 4 Parties identified fewer. The remaining Parties reported the same obstacles (electrocution and/or wind turbines, or neither) in both years.

Parties	2014	2017
Armenia	neither	electrocution

<sup>4</sup> Argentina, Armenia, Australia, Austria, Belarus, Belgium, Benin, Bolivia, Burkina Faso, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Ecuador, Eritrea, Estonia, Finland, Gambia, Georgia, Germany, Hungary, India, Israel, Italy, Kenya, Latvia, Liechtenstein, FYR Macedonia, Madagascar, Mali, Moldova, the Netherlands, Norway, Pakistan, Poland, Portugal, Samoa, Saudi Arabia, Serbia, Slovakia, South Africa, Spain, Switzerland, Syria, Uganda, Ukraine, and Uruguay

Belgium	wind turbines and electrocution	wind turbines
Cyprus	wind turbines and electrocution	wind turbines
Finland	neither	wind turbines
Georgia	neither	electrocution
Israel	electrocution	wind turbines and electrocution
Mali	wind turbines and electrocution	electrocution
Pakistan	electrocution	wind turbines and electrocution
Slovakia	wind turbines and electrocution	electrocution

*Figure 2: Details of changes to obstacles identified between 2014 and 2017*

It is important to note that several countries did not indicate that wind turbines or electrocution were an obstacle in section 1.1 of national reports, yet provided information on these issues in later sections of the report. Conversely, several countries flagged these as obstacles but did not report any action to address them. These inconsistencies are addressed in the relevant sections of this paper in relation to each obstacle.

#### **4. Implementation of CMS Resolutions related to renewable energy and powerlines**

All Parties that reported taking action to implement the relevant Resolutions included information on avifauna, for example, large soaring birds in Egypt and Eastern Europe, seabirds in the North Sea and Baltic Sea, and white storks and cranes across Europe and parts of Africa. Nine Parties (10%) reported actions to address impacts on bats: Belgium, Croatia, the Czech Republic, Germany, Macedonia, Malta, Netherlands, Poland and Serbia. Nine Parties (10%) also provided information on fish: Belgium, Estonia, Fiji, Georgia, the Netherlands, Slovakia, Switzerland, Ukraine and the UK. Seven Parties (8%), reported on marine mammals: Brazil, Croatia, Germany, Kenya, Malta, the Netherlands and Poland.

##### **4.1. Resolutions 7.4 and 10.11: Power lines and Electrocution**

In 2017, Resolutions 7.4 and 10.11 were generally reported on together. Of the 90 submitted reports, 57% (50 Parties) stated that the planning of power lines in relation to migratory species conservation is included in national and regional priorities. This included three Parties who did not report this as a priority in 2014: Austria, Benin and Croatia.

Whereas fifty Parties identified planning of power lines in relation to migratory species conservation as a priority, only thirty-one countries (35%) reported taking action to implement Resolution 7.4 Electrocution of Migratory Birds and/or Resolution 10.11 Powerlines and Migratory Birds. Twenty-six Parties reported creation of, or ongoing compliance to, national or

international legislation. While only 7 Parties reported conducting Strategic Environmental Assessments, 33 Parties referred to Environmental Impact Assessments. Mitigation measures, such as material and technical alteration of existing and planned infrastructure, were reported by 26 Parties. Monitoring and evaluation, and multi-stakeholder/sector cooperation were both mentioned by 23 Parties. Finally, 19 Parties cited spatial planning and mapping.

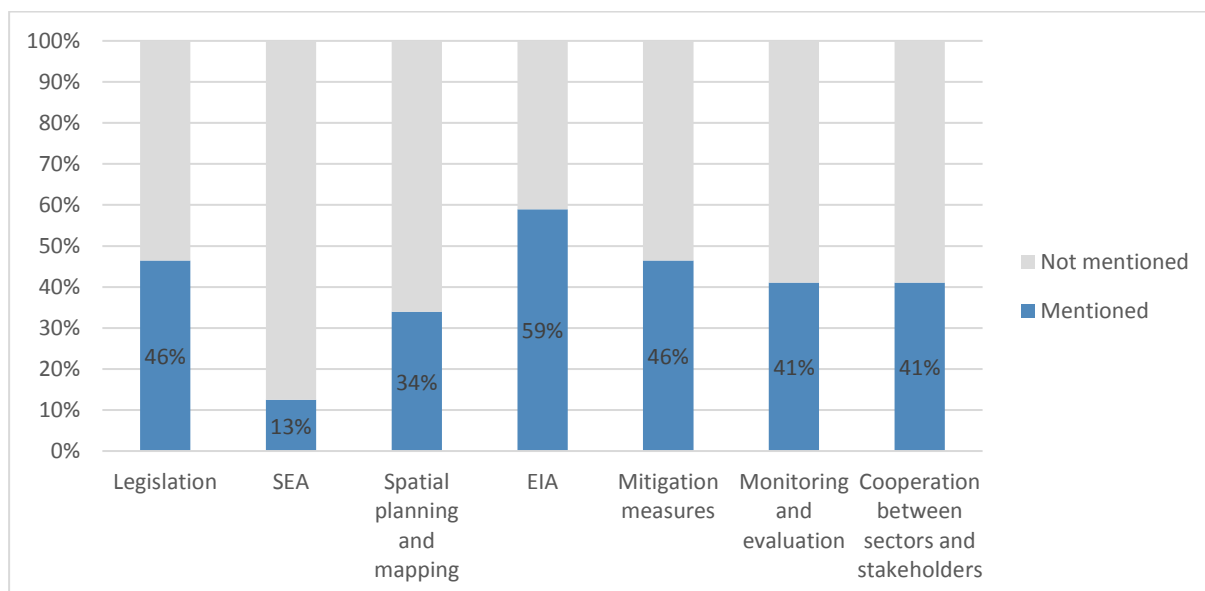


Figure 3: Reported measures taken by Parties to counter powerline-related obstacles to migratory species, as a percentage of the number of Parties that reported taking action on Resolutions 7.4/10.11 in 2017 national reports

Slovakia reported cooperation between non-governmental organisations and energy companies, through a LIFE project, to target 10 Appendix 1 bird species. Artificial nests, barriers, and flight diverters have been installed on power lines in order to avoid collision or electrocution of birds such as the Eastern Imperial Eagle *Aquila heliaca*, and the Great Bustard *Otis tarda*. Portugal,

Hungary and Israel, amongst others, also reported successful alteration and adaptation of power lines in order to avoid electrocution of birds, while Egypt reported progress in the safeguarding of soaring birds, and Morocco highlighted effective legislative measures. Ethiopia stated that attitudes have improved and awareness increased regarding electrocution, and noted reduced incidents of electrocution as a result of EIAs. South Africa reported on longstanding cooperation between Eskom and the Endangered Wildlife Trust (EWT), but identified the need to review monitoring and mitigation measures.

Several countries reported on measures taken to prevent electrocution of bats: Belgium and Macedonia reported national requirements to assess impacts on bats prior to power line construction and all energy projects, respectively, while Serbia reported on efforts to implement the EUROBATS agreement, including through mitigation of electrocution risk.

Of the 59 Parties (67% of total reports) either stating that action is not being taken on Resolutions 7.4/10.11, or not responding to the question, 14 Parties (15%) nevertheless mentioned activities to counter electrocution or powerline collision.

## 4.2. Resolution 7.5/11.27: Renewable Energy

In 2017, Resolutions 7.5 and 11.27 were generally reported on together. Twenty-five Parties (28%) stated that they are taking action on Resolutions 7.5 (Wind Turbines and Migratory Species) and/or 11.27 (Renewable Energy and Migratory Species), which includes wind energy, solar energy, ocean energy, hydro-power and geo-energy. Biomass was also mentioned in reports.

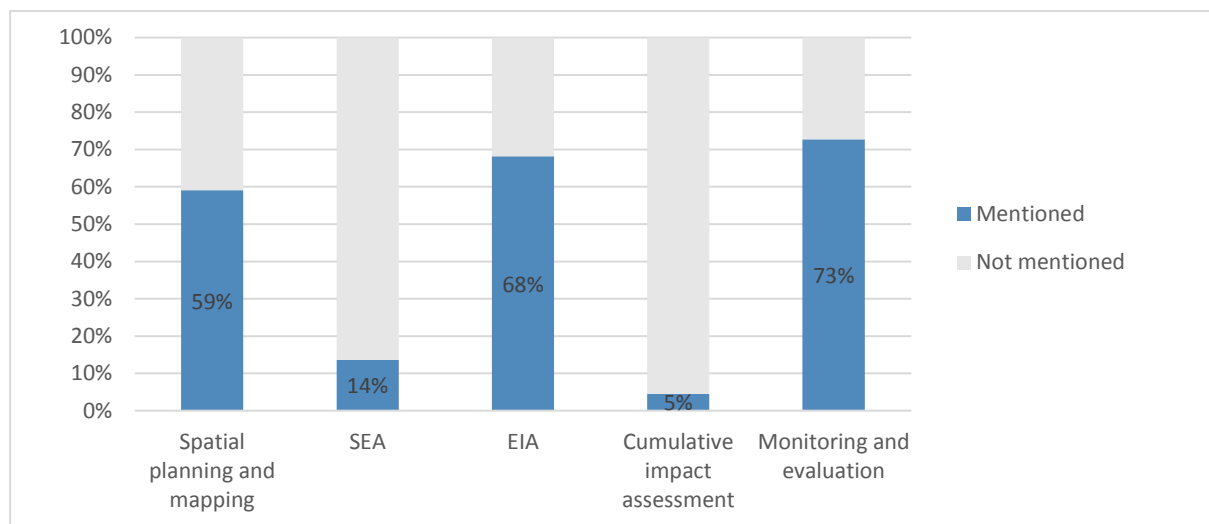


Figure 4: Reported measures taken by Parties to counter renewable energy-related obstacles to migratory species, as a percentage of the number of Parties that reported taking action on Resolutions 7.5/11.27 in 2017 national reports.

Twenty-six Parties mentioned spatial planning and mapping, 6 mentioned Strategic Environmental Assessments, and 30 reported conducting Environmental Impact Assessments. Only 2 mentioned Cumulative Impact Assessments, and 2 Parties stated adherence to the precautionary principle.

A similar percentage of Parties reported on EIA (roughly 70%) and SEA (just over 10%) for both Resolutions 7.5/11.27 (renewable energy), and 7.4/10.11 (power lines). As in 2014, Environmental Impact Assessments were the most frequently taken measure across all Resolutions in response to obstacles to migratory species.

Several European countries mentioned the Natura 2000 scheme in relation to RET, noting that these areas require stringent EIAs, in some cases restrict the building of new developments, and provide corridors for bird and sea turtle migration. Finland, France and Portugal reported that Natura 2000 sites are instrumental in the monitoring and assessment of the impacts of power lines and other infrastructure. Poland highlighted that the creation of its network of Natura 2000 sites is nearing completion, and will protect the habitats of harbour porpoises (*Phocoena phocoena*) and bats, in addition to migratory birds. Hungary commented on a 2005 Government Decree which necessitates thorough environmental impact assessments of proposed wind turbines, especially when these may affect Natura 2000 sites.

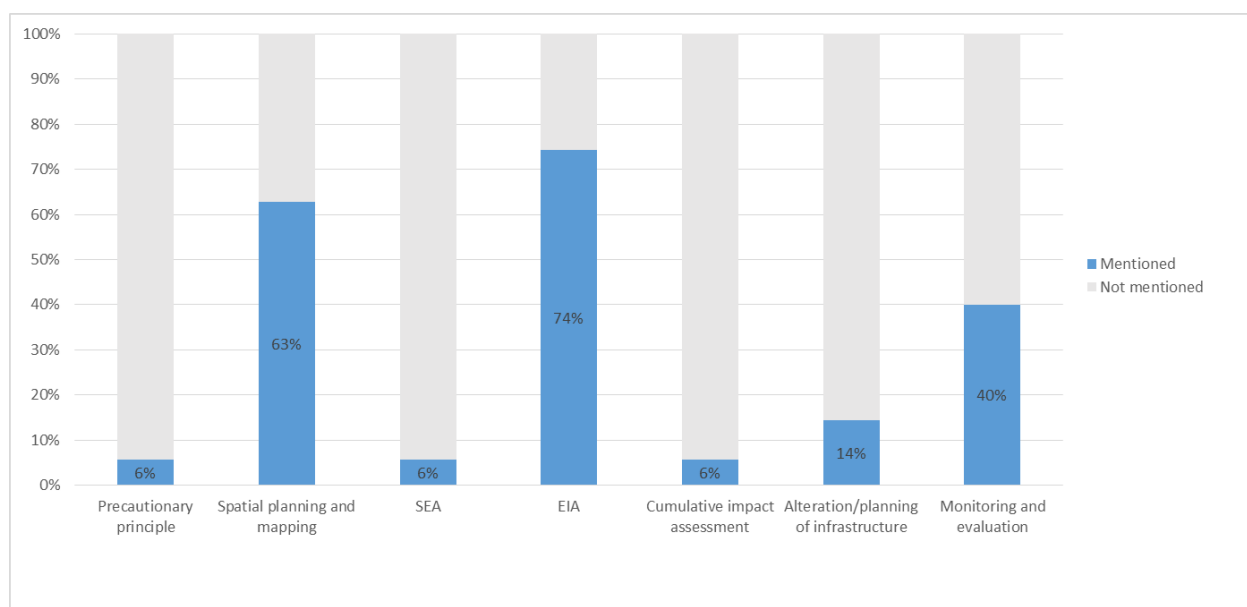
Of the 65 countries either stating that action is not being taken on Resolutions 7.5/11.27, or not responding to the question, 10 nevertheless reported elsewhere in their reports on actions being taken to counter obstacles to migratory species created by renewable energy

installations. This leaves 55 countries (61% of reporting Parties), that either have not provided any information on taking action relating to renewable energy, or that state that no action is being taken.

#### 4.2.1. Wind turbines

Of the RETs, wind is reported on the most. Thirty-five Parties (39% of reports) reported wind turbines as an obstacle, and 35 Parties (39%) reported taking action. These two figures do not correspond to the same selection of Parties. Of the 35 that indicated that wind turbines are an obstacle, 6 (Brazil, Liberia, Panama, Tunisia, Ukraine and Uruguay) did not report on taking any action. Six Parties reported on taking action relating to wind turbines despite not having flagged them as an obstacle.

Of the Parties who reported taking actions relating to wind turbines: 63% (22 Parties) reported conducting spatial planning and mapping in order to implement the Resolutions and counter the impact of wind turbines on migratory species; Strategic Environmental Assessment, cumulative impact assessment and precautionary principle were each reported on by 6% (2 Parties); 74% (26 Parties) reported carrying out Environmental Impact Assessments; 14% (5 Parties) reported on planning or alteration of infrastructure; 40% (14 Parties) reported on monitoring and evaluation.



*Figure 5: Reported measures taken by Parties to counter obstacles to migratory species relating to wind turbines, as a percentage of the number of Parties that reported in 2017 to have taken some form of action to implement Resolutions 7.5/11.27.*

Poland reported that a law on wind investments has restricted establishment of new wind farms in some locations, reducing threats to migratory birds and bats. Germany reported, among other things, successful studies and programmes to reduce bat collisions with wind turbines (RENEBAT), efforts to reduce bird and bat collisions with offshore wind farms, and the implementation by most German federal states of guidelines to mitigate against bird and bat collisions. The Netherlands reported undertaking monitoring, as part of an ASCOBANS National Report, to assess the impact of wind farms and their construction on marine mammals



and fish. Kenya reported increased awareness of the impact of wind turbine noise disturbance on migratory turtles.

The United Kingdom highlighted concerns regarding the impact of offshore wind turbines on fish species, and reported taking action to address this, off the coast of Gibraltar. Belgium referenced flyway and migratory bird mapping carried out by the Research Institute for Nature and Forest, which is being used in the planning of all proposed wind projects in Flanders. India indicated improved results from mitigation measures; Jordan reported positive outcomes from working with energy developers and implementing special guidelines relating to migratory species; and Pakistan stated that significant positive results are yet to be achieved, but are expected in the future as a result of ongoing measures.

#### **4.2.2. Biomass**

Two countries mentioned biomass in their 2017 reports; the same number as in 2014. Belarus reported in both years, stating in 2017 that 49 hectares of open fen mire, the main breeding habitat of the Aquatic Warbler, has been restored in Sporaški through large scale vegetation management, including biomass processing. Slovakia was the second country reporting on biomass in 2017. Information was provided on the production of biomass from Gedrianske lúky Meadows, which was reported to be beneficial for some migratory species. Poland reported in 2014 on the LIFE+ project "Facilitating Aquatic Warbler (*Acrocephalus paludicola*) habitat management through sustainable systems of biomass use" conducted by Polish Society for Protection of Birds (OTOP) between 2010 and 2014.

#### **4.2.3. Hydro and dams**

In 2017, 12 countries (13% of reporting Parties) – Belgium, Costa Rica, Cuba, Côte d'Ivoire, Estonia, Ethiopia, Georgia, FYR Macedonia, Switzerland, Slovakia, Ukraine and Zimbabwe – reported on hydropower and dams as obstacles to migratory species. This compares to just 3 in 2014 (5% of reporting Parties), although it should be noted that Resolution 11.27 was adopted after the 2014 reporting period.

Four key measures were reported against in relation to this issue: spatial planning and mapping, alteration or planning of infrastructure, monitoring and evaluation, and EIA. Spatial planning and mapping to reduce or avoid issues caused by dams and hydropower plants was reported upon by the largest number of countries (7 Parties). Belgium reported developing inventories and mapping obstacles to fish migration, as well as transboundary cooperation with Luxembourg and the Netherlands, while Georgia reported incorporating considerations of migratory routes into project planning. The alteration and planning of infrastructure was reported on by several countries: Belgium reported using protection netting in hydropower plants; Switzerland reported on the construction of upstream and downstream fish passes as recommended by The Federal Office for Environment (FOEN); and Slovakia reported planning fish passes dependent on local geography and water course characteristics. Slovakia reported on monitoring of fish passage through barriers.

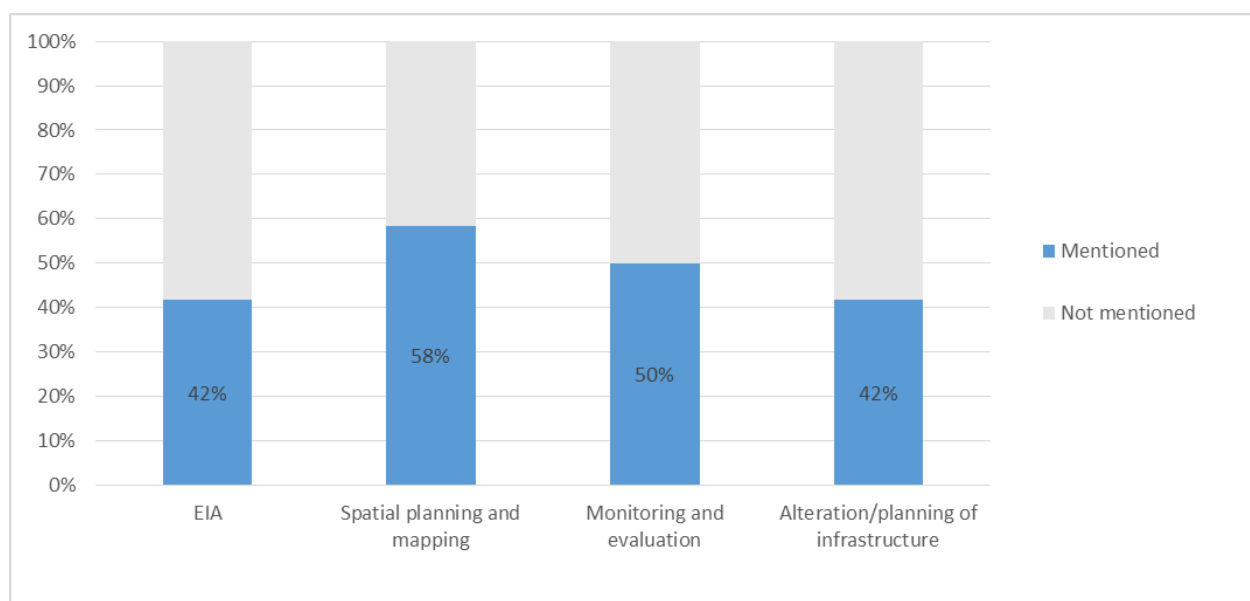


Figure 6: Reported measures taken by Parties to counter obstacles to migratory species relating to hydroelectric plants and dams, taken as a percentage of the number of Parties that reported in 2017 to have taken some form of action to implement Resolution 11.27.

#### 4.2.4. Solar

Two countries reported in 2017 on solar energy in relation to migratory species. This compares to no mention of solar energy in the 2014 reporting cycle, although it should be reiterated that there was no relevant Resolution at the time of the 2014 reports.

Ethiopia stated that “Renewable Energy Technologies and Migratory Species: Guidelines for Sustainable Deployment” was taken into account in implementing environmentally friendly energy resources, including solar energy. Jordan reported work with solar energy developers in order to implement international safeguards and national guidelines to mitigate threats to migratory and resident birds.

### 5. Assistance

Of countries which indicated energy-related obstacles, 33 of those requested assistance with implementation (37% of total reports). In 2014, 26 countries (44% of total reports) asked for assistance with similar obstacles.

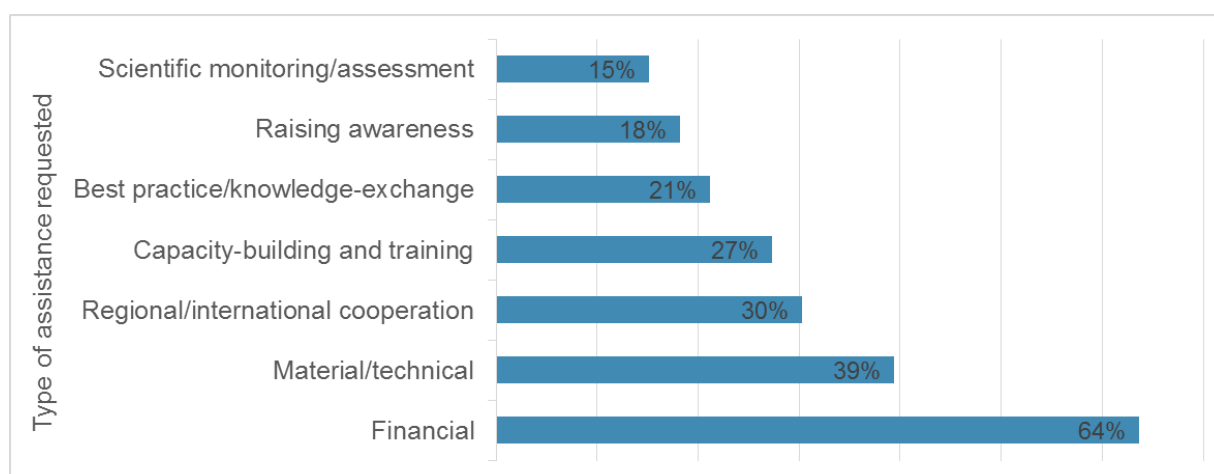
Type of assistance required	Number of Parties	Parties
Financial	21	Armenia, Belgium, Benin, Bolivia, Costa Rica, Côte d'Ivoire, Egypt, Ecuador, Eritrea, Guinea, Iran, Jordan, Kenya, FYR Macedonia, Morocco, Pakistan, Panama, Senegal, Serbia, Spain, Uganda.
Material/technical	13	Algeria, Belgium, Egypt, Eritrea, Ethiopia, Hungary, Iran, Israel, Morocco, Pakistan, Senegal, Serbia, Uganda.

Regional/international cooperation	10	Bolivia, Estonia, Georgia, India, Iran, FYR Macedonia, Pakistan, Serbia, Ukraine, United Kingdom.
Capacity-building/training/human resources	9	Benin, Costa Rica, Côte d'Ivoire, Guinea, Jordan, Morocco, Pakistan, Saudi Arabia, Senegal.
Sharing of best-practice/knowledge-exchange	7	Eritrea, Georgia, India, Pakistan, Serbia, Ukraine, United Kingdom.
Raising awareness amongst stakeholders and civil society	6	Costa Rica, Guinea, Iran, Kenya, Uganda, Zimbabwe.
Scientific monitoring and assessment	5	France, Jordan, Kenya, FYR Macedonia, Saudi Arabia.

*Figure 7: Assistance required by Parties to overcome energy-related obstacles to migration of Appendix 1 species*

In 2017 national reports, financial assistance featured most frequently, with 21 countries requesting financial/economic assistance. This equates to 23% of total reports and 64% of reports requesting some form of assistance.

Across reports asking for assistance, financial assistance is followed by material and technical support (40%); regional and international cooperation (30%); capacity-building and training (27%); sharing of best practice and knowledge-exchange (21%); raising awareness (18%); and help with scientific monitoring and assessment (15%).



*Figure 8: Types of assistance requested by Parties who identified wind turbines and electrocution as obstacles to migratory species in Appendix 1, taken as a percentage of the total number of Parties requesting assistance.*

In some cases, a country has identified numerous obstacles, but has not clarified for which obstacle(s) they require the most assistance. The analysis above includes reports where wind

turbines and/or electrocution has been identified as an obstacle, and the obstacle for which assistance is required is either unspecified or explicitly refers to wind turbines or electrocution.

## **6. Barriers to Implementation**

Barriers to the implementation of Resolution 11.27 were identified during the first meeting of the Energy Task Force. Workshop participants identified barriers under four key groupings. These are discussed below.

### **i. Inadequate legislation and monitoring**

Participants stressed that a key problem is the inadequate enforcement of policy and legislation, and the lack of monitoring of tool and guideline implementation. Participants recommended standardising frameworks on EIA, monitoring protocols, and cumulative impact assessments, and creating codes of practice for data collection, planning, mitigation and operational guidelines.

### **ii. Technical barriers**

Participants reported technical barriers that restrict the effective implementation of Resolutions, for instance, a lack of precise species-site data for mapping migratory species pathways, and a lack of knowledgeable, qualified and/or skilled personnel on the ground. It was suggested that species specific information, where it exists, should be made available to project developers, alongside information on best practice. Workshop participants concurred that where there is a need for more data, targeted studies should be carried out, and training should be carried out where appropriate.

### **iii. Information and communication issues**

Another key issue which was raised is the lack of awareness within the private sector of the impact of energy development on migratory species. It was suggested that more ornithological knowledge must be disseminated, so that actors are fully informed and understand the win-win opportunities to save both wildlife and money in the development of energy projects. A strong economic argument is essential. To this end, the Energy Task Force members further stressed that communication and training materials should speak in 'their' language, whilst conveying important details about species protection. Key audiences such as utilities, project developers and investors must be carefully targeted. Participants agreed that technological solutions need to be shared between groups. Further to this, mechanisms must be put in place to ensure compliance to national and international standards.

Participants raised that migratory species conservation is considered by some as an obstacle to RET development. It was explained that action on migratory species sparks fears that climate and economic action could be inhibited, and there is apathy and resistance from the energy and environment sector due to a lack of awareness. In this light, it was agreed that more effort must be made to engage with the energy sector and environmental organisations on national and international levels: the opportunities associated with developing energy infrastructure which is both climate- and species-friendly must be emphasized: you cannot solve one environmental problem by creating another environmental problem.

The Energy Task Force members noted that there is a lack of dialogue between stakeholders as a whole, and a lack of knowledge about best practice. Training and skills transfer must therefore be strengthened between Task Force members and other stakeholders. It was

specified that tools and brochures for informing and training must be developed, and guidelines promoted. Some members indicated that more must be done to dispel fears about the reputational risk of data sharing, whilst respecting (or altering as appropriate) agreements on non-disclosure. Political will must be engaged to work towards legislative change. The participants raised the need for governments to provide oversight throughout the lifecycle of a project decision-making does not end with the EIA. It was stated that developing a Memorandum of Understanding amongst governments, civil society, and the private sector would help to cement objectives. These actions must amount to a change in attitude: the idea that we are all in this together is vital to the work of the ETF.

#### **iv. Lack of resources and capacity**

Inadequate financial support for projects was a recurring theme. It was suggested that priority projects and species must be identified, and made the focus of fundraising and of existing funding and resources. It was also stated that capacity-building is key in order to ensure that new and ongoing projects can be supported, and so that they fit in a sustainable manner with other projects.

## **7. Summary and discussion**

More than 60% of reporting Parties identified RETs and/or associated infrastructure as a threat to migratory species of wild animals. The majority of these Parties also reported taking some form of action to address this threat, with some Parties already reporting successful outcomes.

Effectively reconciling the development of RETs and associated infrastructure will require interventions across the entire planning cycle, from spatial planning through to mitigation measures and monitoring and evaluation. However, few countries are comprehensively implementing the Resolutions. For example, while Environmental Impact Assessments are commonly reported on across the different Resolutions, only a handful of countries report on conducting Strategic Environmental Assessments or Cumulative Impact Assessments.

There are several barriers to implementing the Resolutions that need to be addressed. There was a degree of consistency between the information provided in the national reports and the outputs of the first meeting of the Energy Task Force, which identified four major barriers: inadequate legislation and monitoring, technical barriers, information and communication issues, and lack of capacity and resources.

There are inconsistencies and gaps within countries' reporting. This relates to the identification of obstacles, and to the reporting of action being taken. More comprehensive and consistent reporting would provide a more accurate assessment of progress made globally and by individual Parties to reconcile the impacts of renewable energy and powerline deployment with migratory species conservation, and to inform strategic planning for the future.

Important progress has been made to implement Resolutions on RET and related infrastructure. Parties are encouraged to ramp up their work to implement the CMS Resolutions 7.4, 7.5, 10.11, and 11.27 in a comprehensive and ambitious manner. The Energy Task Force will continue to work to support the implementation of these Resolutions, and, ultimately, to ensure that all energy sector developments are undertaken in such a way that negative impacts on migratory species are avoided.

## 8. Appendix

### 8.1. List of country name abbreviations

<b>Full name</b>	<b>Abbreviated name</b>
Plurinational State of Bolivia	Bolivia
Republic of the Congo	Congo
Republic of Moldova	Moldova
Republic of Serbia	Serbia
Syrian Arab Republic	Syria
The Former Yugoslav Republic of Macedonia	FYR Macedonia
United Kingdom of Great Britain and Northern Ireland	United Kingdom
United States of America	United States

### 8.2. Overview table of 2017 national reports

	Obstacles to migration that exist in relation to Appendix I bird species	Report implementing Resolutions 7.4 (electrocution) /10.11 (power lines)	Report implementing Resolutions 7.5 (wind turbines) /11.27 (renewable energy)	Mention wind turbines	Mention hydro/dams	Mention biomass	Mention solar
Afghanistan	neither	*	*	*	*	*	*
Albania	neither	*	*	*	*	*	*
Algeria	electrocution	*	*	*	*	*	*
Angola	neither	*	*	*	*	*	*
Argentina	neither	*	*	*	*	*	*
Armenia	electrocution	*	*	*	*	*	*
Australia	wind turbines	*	*	*	*	*	*
Austria	wind turbines and electrocution	*	✓	✓	*	*	*
Belarus	electrocution	*	*	*	*	✓	*
Belgium	wind turbines	*	✓	✓	✓	*	*
Benin	electrocution	*	*	*	*	*	*
Bolivia	electrocution	*	*	*	*	*	*
Brazil	wind turbines	*	*	*	*	*	*
Burkina Faso	electrocution	*	*	*	*	*	*

Burundi	neither	*	*	*	*	*	*
Cabo Verde	neither	*	*	*	*	*	*
Chile	neither	*	*	*	*	*	*
Congo	electrocutio n	*	*	*	*	*	*
Cook Islands	neither	*	*	*	*	*	*
Costa Rica	electrocutio n	✓	*	*	✓	*	*
Cote d'Ivoire	electrocutio n	*	*	*	✓	*	*
Croatia	wind turbines and electrocutio n	✓	*	✓	*	*	*
Cuba	neither	*	*	*	✓	*	*
Cyprus	wind turbines	✓	✓	*	*	*	*
Czech Republic	wind turbines and electrocutio n	*	*	✓	*	*	*
Denmark	neither	*	*	*	*	*	*
Egypt	wind turbines	*	✓	✓	*	*	*
Ecuador	wind turbines	*	*	*	*	*	*
Eritrea	electrocutio n	*	*	*	*	*	*
Estonia	wind turbines and electrocutio n	✓	*	✓	✓	*	*
Ethiopia	wind turbines and electrocutio n	✓	✓	✓	✓	*	✓
Equatorial Guinea	neither	*	*	*	*	*	*
Fiji	neither	*	*	*	*	*	*
Finland	wind turbines	✓	✓	✓	*	*	*
France	wind turbines and electrocutio n	✓	✓	✓	*	*	*
Gambia	neither	*	*	*	*	*	*
Georgia	electrocutio n	✓	*	*	✓	*	*
Germany	wind turbines and electrocutio n	✓	✓	✓	*	*	*
Guinea	electrocutio n	✓	✓	*	*	*	*

Hungary	electrocutio n	✓	✓	✓	.	.	.
India	wind turbines and electrocutio n	✓	.	.	.	.	.
Iran	electrocutio n	.	.	.	.	.	.
Israel	wind turbines and electrocutio n	.	.	✓	.	.	.
Italy	wind turbines and electrocutio n	.	.	.	.	.	.
Jordan	wind turbines and electrocutio n	.	✓	✓	.	.	✓
Kenya	electrocutio n	✓	✓	✓	.	.	.
Kyrgyzstan	neither	.	.	.	.	.	.
Latvia	neither	✓	✓	✓	.	.	.
Liberia	wind turbines and electrocutio n	.	.	.	.	.	.
Liechtenstei n	neither	.	.	.	.	.	.
Luxembourg	wind turbines and electrocutio n	.	✓	✓	.	.	.
Macedonia	wind turbines and electrocutio n	✓	✓	✓	✓	.	.
Madagascar	neither	✓	.	.	.	.	.
Mali	electrocutio n	.	.	✓	.	.	.
Malta	neither	.	.	.	.	.	.
Mauritius	neither	.	.	.	.	.	.
Moldova	neither	✓	✓	✓	.	.	.
Monaco	neither	.	.	.	.	.	.
Montenegro	neither	.	.	.	.	.	.
Morocco	wind turbines and electrocutio n	✓	✓	✓	.	.	.
Netherlands	neither	✓	✓	✓	.	.	.
Nigeria	neither	.	.	.	.	.	.
Norway	wind turbines	✓	✓	✓	.	.	.



Pakistan	wind turbines and electrocution	✓	✓	✓	.	.	.
Palau	neither	.	.	.	.	.	.
Panama	wind turbines	.	.	.	.	.	.
Philippines	neither	.	.	.	.	.	.
Poland	wind turbines	✓	✓	✓	.	.	.
Portugal	wind turbines and electrocution	✓	✓	✓	.	.	.
Rwanda	neither	.	.	.	.	.	.
Samoa	neither	.	.	.	.	.	.
Saudia Arabia	electrocution	✓	.	.	.	.	.
Senegal	wind turbines and electrocution	✓	.	.	.	.	.
Serbia	neither	.	✓	✓	.	.	.
Slovakia	electrocution	✓	.	.	✓	✓	.
Slovenia	neither	✓	.	.	.	.	.
South Africa	wind turbines and electrocution	✓	✓	✓	.	.	.
Spain	wind turbines and electrocution	✓	.	.	.	.	.
Sri Lanka	neither	.	.	.	.	.	.
Switzerland	wind turbines and electrocution	✓	✓	✓	✓	.	.
Syria	neither	.	.	.	.	.	.
Tanzania	neither	.	.	.	.	.	.
Togo	neither	.	.	.	.	.	.
Tunisia	wind turbines and electrocution	.	.	.	.	.	.
Uganda	electrocution	.	.	.	.	.	.
Ukraine	wind turbines and electrocution	✓	.	.	✓	.	.
United Arab Emirates	neither	.	.	.	.	.	.

United Kingdom	wind turbines	.	.	✓	.	.	.
Uruguay	wind turbines	.	.	.	.	.	.
Zimbabwe	electrocution	.	.	.	✓	.	.

### 8.3. Breakdown of CMS Resolutions and thematic analysis

Key asks from Resolutions 7.4 and 10.11 are summarised in the table below, alongside the 7 themes used for analysis of country reports.

Themes	Resolution 7.4 Electrocution	Resolution 10.11 Power Lines
Environmental Impact Assessment		2.1 <i>apply</i> , in the African-Eurasian region as far as possible, and as applicable elsewhere, AEWCA Conservation Guidelines No. 11 on Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) procedures regarding the development of power lines;
Strategic Environmental Assessment		2.1 <i>apply</i> , in the African-Eurasian region as far as possible, and as applicable elsewhere, AEWCA Conservation Guidelines No. 11 on Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) procedures regarding the development of power lines;
Spatial Planning and Mapping		2.3 <i>establish</i> a baseline of bird distribution, population sizes, migrations and movements, including those between breeding, resting and feeding areas, as early as possible in the planning of any power line project, over a period of at least one year, and with particular emphasis on those species known to be vulnerable to

		<p>electrocution or collision and if such studies identify any risks, to make every effort to ensure these are avoided.</p> <p>2.4 <i>design</i> the location, route and direction of power lines on the basis of national zoning maps and avoid, wherever possible, construction along major migration flyways and in habitats of conservation importance, such as Important Bird Areas, protected areas, Ramsar sites, the East Asian-Australasian Flyway Site Network, the West/Central Asian Site Network for Siberian Crane and other waterbirds and other critical sites as identified by the Critical Site Network (CSN) Tool for the African-Eurasian region;</p>
Mitigation Measures	<p>3 <i>Encourages</i> constructors and operators of new medium-voltage transmission lines and associated towers to incorporate appropriate measures aimed at protecting migrating birds against electrocution.</p> <p>4 <i>Calls</i> on Parties and non-Parties to appropriately neutralise existing towers and parts of medium-voltage transmission lines to ensure that migratory birds are protected against electrocution</p> <p>5 <i>Invites</i> all concerned to apply as far as possible the catalogue of measures contained in document UNEP/CMS/Inf.7.21, which are based on the principle that birds should not be allowed to sit on parts that are dangerously close to the transmission parts under voltage</p>	<p>2.5 <i>identify</i> those sections of existing power lines that are causing relatively high levels of bird injury and/or mortality due to electrocution and/or collision, and modify these as a matter of priority by applying the techniques recommended by the Guidelines in UNEP/CMS/Conf.10.30</p>
Legislation	<p>2 <i>Calls</i> on all Parties and non-Parties to include appropriate measures in legislation and other provisions for planning and consenting medium-voltage</p>	

	electricity transmission lines and associated towers, to secure safe constructions and thus minimise electrocution impacts on birds	
Cooperation between Sectors and Stakeholders	<p>1 <i>Calls</i> on all Parties and non-Parties to curb the increasing electrocution risk from medium voltage transmission lines to migratory birds and to minimise this risk in the long term</p> <p>6 <i>Encourages</i> constructors and operators to cooperate with ornithologists, conservation organizations, competent authorities and appropriate financial bodies in order to reduce the electrocution risk posed to birds from transmission lines</p>	<p>2.2 <i>consult</i> regularly relevant stakeholders, including government agencies, scientific bodies, non-governmental organizations and the energy sector, in order to monitor jointly the impacts of power lines on birds and to agree on a common policy of action;</p> <p>3 <i>Urges</i> Parties and <i>invites</i> non-Parties, inter-governmental organizations and other relevant institutions, as appropriate, to include the measures contained in this Resolution in their National Biodiversity Strategies and Action Plans and relevant legislation, if applicable, in order to ensure that the impact of power lines on bird populations is minimized</p> <p>4 <i>Encourages</i> electricity companies such as RWE Rhein-Ruhr Netzservice GmbH to disseminate the Guidelines widely within their networks, including at relevant conferences;</p> <p>7 <i>Urges</i> Parties and <i>invites</i> UNEP and other relevant international organizations, as well as the energy sector, to support financially the implementation of this Resolution</p>
Monitoring and evaluation		2.6 <i>regularly</i> monitor and evaluate the impact of power lines on bird populations at the national scale, as well as the effectiveness of mitigation

		<p>measures put in place to minimize the impact of power lines on bird populations;</p> <p>3 <i>calls on Parties</i> to report progress in implementing this Resolution to each Conference of the Parties as part of their National Reports;</p> <p>5 <i>Requests</i> the Scientific Council, specifically the Working Groups on birds and flyways, to monitor the implementation of this Resolution and to provide further guidance when relevant new developments on reducing the impact of power lines on birds become available, such as improved mitigation techniques;</p>
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Key asks from Resolutions 7.5 and 11.27 have been summarised in the table below, which shows the 6 themes used for the analysis of country reports.

<b>Themes</b>	<b>Resolution 7.5 Wind Turbines</b>	<b>Resolution 11.27 Renewable Energy</b>
Environmental Impact Assessment	<p>b) to apply and strengthen, where major developments of wind turbines are planned, comprehensive strategic environmental impact assessment procedures to identify appropriate construction sites</p> <p>c) to evaluate the possible negative ecological impacts of wind turbines on nature, particularly migratory species, prior to deciding upon permission for wind turbines</p>	<p>2.1 apply appropriate Strategic Environment Assessment (SEA) and EIA procedures, when planning the use of renewable energy technologies, avoiding existing protected areas in the broadest sense and other sites of importance to migratory species</p>

Strategic Environmental Assessment		2.1 apply appropriate Strategic Environment Assessment (SEA) and EIA procedures, when planning the use of renewable energy technologies, avoiding existing protected areas in the broadest sense and other sites of importance to migratory species
Cumulative Impact Assessment	d) to assess the cumulative environmental impacts of installed wind turbines on migratory species	2.3 apply appropriate cumulative impact studies to describe and understand impacts at larger scale, such as at population level or along entire migration routes (e.g., at flyways scale for birds)
Spatial Planning and Mapping	a) to identify areas where migratory species are vulnerable to wind turbines and where wind turbines should be evaluated to protect migratory species  e) taking account of exchange of information provided through the spatial planning processes	
Monitoring and Evaluation	e) to develop wind energy parks taking account of environmental impact data and monitoring information as it emerges	2.2 undertake appropriate survey and monitoring both before and after deployment of renewable energy technologies to identify impacts on migratory species and their habitats in the short- and long-term, as well as to evaluate mitigation measures
Precautionary Principle	e) to take full account of the precautionary principle in the development of wind turbine plants	

**Resolution 11.27: priorities for different types of renewable energy**

3. *Urges* Parties to implement, as appropriate, the following priorities in their development of renewable energy technologies:

3.1 **wind energy**: undertake careful physical planning with special attention to the mortality of birds (in particular of species that are long-lived and have low fecundity) and bats resulting from collisions with wind turbines and the increased mortality risk to cetaceans from permanently reduced auditory functions, and consider means of reducing disturbance and displacement effects on relevant species, including deploying measures such as 'shutdown on demand' as appropriate;

3.2 **solar energy**: avoid protected areas so as to limit further the impacts of deploying solar power plants; undertake careful planning to reduce disturbance and displacement effects on relevant species, as well as to minimise the risks of solar flux and trauma related injuries which could be a consequence of a number of solar energy technologies;

3.3 **ocean energy**: give attention to possible impacts on migratory species of increased noise and electromagnetic field disturbance especially during construction work in coastal habitats, and injury;

3.4 **hydro-power**: undertake measures to reduce or mitigate known serious impacts on the movements of migratory aquatic species, such as through the installation of measures such as fish passageways; and

3.5 **geo-energy**: avoid habitat loss, disturbance and barrier effects in order to continue to keep the overall environmental impacts at their current low level;