World Bank

Birds and Solar Energy within the Rift Valley/Red Sea Flyway

Solar energy is a relatively new technology, and while the environmental impacts are thought to be benign, little research and monitoring has been done in this regard. The impacts are likely to be related to collision risks with associated infrastructure and possibly panels; habitat loss, disturbance and fragmentation; heat effects; and water use.

Donors, development banks and financiers can minimise any potential adverse impacts by:

- Providing an enabling environment for the mainstreaming of bird and biodiversity concerns across government departments and different sectors
- Creating an enabling environment for governments to undertake strategic planning of developments, utilising the **Strategic Environmental Assessment** (**SEA**) approach
- Funding only those projects which pose minimum risks to birds and biodiversity
- Stipulating in contracts and funding agreements that **Environmental Impact Assessment** (**EIA**), including ornithological assessments and post-construction monitoring, is to be carried out for all developments
- Using ornithological assessments and post-construction monitoring that are appropriate and reviewed by a trained expert, to ensure adequate assessment of funded projects
- Recognising the importance of having SEA, EIA and post-construction ecological and bird data freely and publicly available from a centralised source
- Increasing local capacity building in the use of SEA, EIA and monitoring methodologies in governments and civil society
- Recognising that this is a new and developing technology, and that ongoing research is required in the region
- Committing resources to carry out this further research on the impacts of solar developments on birds and biodiversity
- Encouraging regional sharing of good practice examples and information, to reduce impacts and improve knowledge.

BirdLife International supports the transition to more renewable sources of energy. Renewable energy will deliver a number of long term benefits, which can help in reducing greenhouse gas emissions and deliver lasting economic and social benefits to countries and communities, by among other things reducing reliance on fossil fuels, and contributing to energy self-sufficiency. However this transition must avoid harm to ecosystems and biodiversity.

The high solar potential of the region has been noted, with extensive developments being planned in a number of countries. Solar development globally is growing at a rate of 40% per year, but still only contributes about 0.6% of electricity generation. Solar however has the greatest potential for global energy generation of all renewable energy resources. For instance, Concentrated Solar Power technology has the capacity to provide for about 7% of the total electricity needs projected

for the world by 2030, and 25% by 2050[1]. This growth in solar could potentially occupy large areas of land. For example the Shams 1 project in the United Arab Emirates, consisting of 768 parabolic troughs, occupies an area of 2.5 square kilometres.

Solar is believed to be one of the most environmentally benign of all the renewable energy technologies. As with any infrastructural development there are potential adverse impacts, but with appropriate planning, impacts can be minimised. Where consideration is not given to the cumulative risks associated with successive developments, the risks to birds and biodiversity could be significant within the flyway.

The technologies used in solar energy developments can be broken down into four categories:

1. **Photovoltaic/Concentrated Photovoltaic**, which converts the Sun's energy directly into electricity to be exported to the grid
2. **Concentrated Solar Power** (**CSP**), which uses mirrors to concentrate the Sun's rays, and a fluid-based system to drive steam generators which deliver electricity to the grid
3. **Solar thermal heating** panels use the direct heat of the Sun to raise the temperature of water. Panels are usually mounted on the roofs of buildings with a simple arrangement of dark-coloured water pipes beneath glass. This is used to heat water for buildings, swimming pools, and for various industries
4. **Passive solar**, which generally refers to the use of glazing, building design and building orientation to contribute to space heating

BirdLife recognises that a balanced approach to renewable energy development is needed, which recognises national, regional and international priorities, and in which competing interests and priorities are potentially compared and analysed against each other. Defining this approach is an intricate process, requiring the inputs of a range of stakeholders to ensure that balanced decisions and the most sustainable solutions are achieved. National Governments have the right to develop in the way they feel is most appropriate, but development banks and financiers can play a key strategic role in helping to ensure long-term and strategic planning which integrates bird and biodiversity concerns, which will ensure lasting sustainable development.

BirdLife International is committed to working with donor organisations, development banks and financiers, to ensure that bird and biodiversity concerns are integrated into programme and project funding. Development banks and other funding organisations have a responsibility to the citizens of their own countries, and to the citizens of the recipient country, to make sure environmental externalities are minimised.

The Rift Valley/Red Sea flyway is the second most important flyway in the world for migratory soaring birds. More than 1.5 million migratory soaring birds of 37 species use the flyway, including raptors, storks, pelicans and cranes, of which five are globally threatened. Each country within the flyway and across the region has a unique contribution to make to ensure the continued resilience of the bird species present within their borders, and to conservation at the flyway scale as birds move through and use habitats within their countries. An adverse impact in one area along the flyway could have significant knock-on effects in other regions or countries by breaking the links within the flyway. Financiers and development banks working across the region can help to ensure that this globally important flyway and the birds which use it are protected.

The potential for renewable energy generation within the region is very high, with significant developments across the flyway. Many countries have made commitments to the generation of renewables as part of their energy mix. For example, Egypt has a domestic energy target of 20% from renewables by 2020, and Jordan has a target of 10% by 2020. By investing in the renewable energy infrastructure, donor organisations and development banks can support countries and private enterprises in the shift to renewable energy. To be truly sustainable, this renewable infrastructure must take into account bird and biodiversity concerns, and ensure that these concerns are integrated into the decision-making processes when identifying appropriate technologies and locations. These bird and biodiversity concerns should be reflected in loan agreements and project contracts.

New solar energy developments may mean the construction of power lines, the cumulative length of which could reach thousands of kilometres. Such power infrastructure may pose a high risk to birds and bird populations, potentially leading to the deaths of thousands of birds across the region annually. BirdLife International has developed guidance material in relation to power lines for the region, which can be referenced to minimise the impact on birds and biodiversity. Locating renewable energy development sites close to existing power line infrastructure will minimise the need to construct additional lines.

This document will concentrate on photovoltaic (PV) and concentrated solar power (CSP) technologies. Solar thermal and passive solar heating are not believed to pose any direct threat to birds and biodiversity, and in the majority of cases are confined to urban environments. The same is true for roof-mounted solar PV in the urban environment, or on single houses. The different technologies can have differing effects, depending on site-specific characteristics. BirdLife Partners can provide valuable knowledge in relation to appropriate locations and likely impacts. Development banks and financiers must ensure that the likely impacts are minimised, and that where impacts are occurring, monitoring is taking place to understand these impacts.

Potential Impacts

Industrial-scale solar technologies are relatively new, with a limited number of significant developments worldwide, and as yet little is known about their impact on bird populations and biodiversity in general. Studies that have taken place have shown that the environmental effects are relatively benign, but no studies have been completed in the Rift Valley/Red Sea region. Therefore one of the most urgent requirements is for further research on the impacts of solar technology on birds, and biodiversity in general, within the Rift Valley/Red Sea flyway.

The effects of solar developments on birds and biodiversity could include:

- **Water use**: the volume of water used for cleaning purposes can be significant[2]. For Concentrated Solar Panel technologies, water may be used in the cooling process, or to generate steam to drive a turbine. The potential extraction rate can be very high[3] and may have a significant impact on local and regional hydrology and associated avifauna, especially in water-constrained areas;
- **Habitat loss/fragmentation**: potentially this is the largest impact, as large areas of habitat may be removed, replaced or degraded. The actual ecological significance of the impact will be site and scale specific; many developments are likely to have limited impacts. An assessment of the ecological value of the development's footprint will show the significance of the impact. The assessment of cumulative impacts is vital;

[1] Pavlovic TM, Radonjic IS, Milosavljevic D D, Pantic LS (2012) A review of concentrating solarpower plants in the world and their potential use in Serbia
[2] Guardian (2012) www.guardian.co.uk/environment/2011/dec/11/sahara-solar-panels-green-electricity
[3] Damerau K, Williges K, Patt A, Gauche P (2011) Costs of reducing water use of concentrating solar power to sustainable levels: Scenarios for North Africa Energy Policy, 39(7):4391-4398

- **Risk of collision**: with associated infrastructure, including fencing and towers, but particularly with associated power lines. Some species of birds may collide with panels because they are attracted to shaded areas, particularly if panels are located in previously undisturbed areas;
- **Pollution**: activities during construction and ongoing maintenance, and the use of chemicals in CSP processes, could lead to the release of pollutants into the environment. Contaminated liquids in hyper-arid regions could be detrimental to large numbers of migrants.

A number of other scenarios have been put forward as potentially having an adverse impact, but there is limited data on these, and they require further study;

- **Disturbance**: Disruption of a bird's natural patterns of behaviour may lead to disorientation and increased energy use. Large arrays of panels may resemble water bodies, attracting some bird species. One study indicated that insects were attracted to laying eggs on panels, as they confused them with water[4]. The shade cast by panels can also attract birds. Disturbance during construction and maintenance may also be an issue. Other possible issues resulting from increased human access to otherwise inaccessible areas should also be assessed;
- **Change of habitat function**: the increase in shade and the changing water regime within a solar power plant change the micro-climate, and may change vegetation patterns. This means potential indirect impact on breeding and resting birds by changing food sources (e.g. seeds, insects, plants and animals) and also the use of solar panels for nesting;
- **Barrier effect**: Links within the flyway could be disrupted if very large areas are used without assessment of the cumulative impacts on migratory soaring bird populations, or if solar arrays occupy habitat at known resting sites, forcing the birds to abandon the area;
- **Potential heat damage**: a theoretical risk from heliostat technology, which concentrates solar energy on a central collector, generating temperatures in excess of 1000°C, is that birds flying within its beam may be injured or killed. One study at the now decommissioned Solar One facility in California indicated that while some birds were affected, the overall outcome was not significant[5].

The potential impacts are likely to vary depending on the site location, and also the particular species migrating through, or resident in, an area. Grassland, steppe and desert bird species sensitive to disturbance, such as bustards, may be vulnerable to habitat loss and fragmentation of the landscape. Particularly high impacts are likely to occur where these developments coincide with migratory resting, staging or stopping-off spots, or areas of undisturbed habitat.

Another potential effect which requires further investigation is the ability of large industrial-scale projects to affect the thermal updraft of an area, which could impact positively or negatively on soaring birds. This requires further development-related research to identify the extent and range of impacts, if any.

Due to the lack of knowledge in the region, and the paucity of data on migratory soaring birds, it is recommended that an appropriate full EIA is conducted for all developments.

A precautionary avoidance approach should be used in the selection and development of sites, but this need not deter developments in all cases, as mitigation actions and habitat manipulation may be possible. Solar energy potentially has a valuable contribution to make as part of a diverse renewable energy mix within the region. Development banks and financiers should prioritise projects which have minimal environmental externalities.

Strategic planning and assessment

Potential negative impacts associated with renewable energy developments will be significantly reduced by the use of a positive planning framework and a strategic approach to development. Development banks, donor organisations and financiers can play an important role in advising on, and supplying the funding required, for the development of a strategic planning framework. They can also ensure that this framework integrates bird and biodiversity concerns, and is mainstreamed and communicated across government departments, and integrated into other strategies, including national development plans and sustainable development strategies.

At the pre-planning stage a **Strategic Environmental Assessment** (**SEA**) should be carried out to identify areas which are suitable for development. Where there is a high probability of a significant impact, this area should be excluded from future development. Protected areas and other sites important for biodiversity, such as Important Bird Areas, will require in-depth investigation. Consideration must be given to the appropriate technology to use, given the characteristics of the site. Some areas may be unsuitable for CSP technologies because of water resource constraints, and sites next to water bodies may require mitigation measures to prevent collisions by birds.

SEA should also take into account other existing and planned development activities in the target region, to ensure that cumulative impacts from solar and other sectors do not produce unexpected landscape-wide barriers or hazards that might emerge if considered in isolation from the development matrix of the region. Development banks and financiers working across the region are well placed to analyse the cumulative effects of developments across the flyway, and individual banks should work with each other to ensure the cumulative impact is minimised and best practice examples are shared. Development banks and financiers can also provide the enabling environment to carry out the SEA, by supplying valuable expertise, pooling resources, and increasing national capacity.

A range of stakeholders must be included as part of any SEA processes, including local communities, indigenous peoples, planners, researchers, and specific interest groups including conservation groups. Stakeholder consultation enables expert and local knowledge to be incorporated at an early stage, and should continue throughout the differing stages of the SEA. Contracts and project legal agreements must ensure that stakeholder consultation takes place, and that their concerns are reflected in any decisions made.

The use of an SEA enables long-term strategic analysis, and will aid in identifying areas suitable for future development at a number of scales, and also cut down on potential impact costs in the future. The SEA must integrate bird concerns, and the assessment methods for the ornithological appraisal require expert review prior to commencement, to ensure that the appraisal is to a high standard and generates accurate results.

The SEA will be reinforced and enhanced when conducted in partnership with sensitivity mapping. **Sensitivity mapping** presents a strategic view of the sensitivities of bird species to infrastructural developments. BirdLife International has developed and is continuing to refine a sensitivity mapping tool for the Rift Valley/Red Sea Area relating to wind farm developments and migratory soaring birds. Although the sensitivity layer is specifically for wind farms, it shows

[4] Horváth, G., Blahó, M., Egri, A. *et al*. (2010) Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. Conservation Biology. 24(6):1644-1653

[5] McCary M.D., McKernan R.L., Schreiber R.W., Wagner W.D.& Sciarrotta (1986) Avian mortality at a solar energy plant Journal of Field Ornithology 57 (2) 135-141

congregations of migratory soaring birds and areas important to migratory soaring birds, such as resting sites, which can inform site selection for solar developments. The sensitivity map and the information it contains offer a valuable resource to plan future developments, but will be enhanced through the availability of additional data. Development banks and financiers should ensure that any additional data which is generated through an SEA is freely and publicly available.

Other support tools such as the 'IBAT – for business' can also help guide the decision-making processes, by identifying important sites and also i species which could be present in an area, which can guide assessments.

Once a site has been identified, it is essential that a site-specific **Environmental Impact Assessment** (**EIA**) takes place. Development banks and financiers must ensure that an EIA is carried out, and budgets set aside for this to be thorough and appropriate. The EIA must appropriately assess the ornithological value and the biodiversity of the site, such as the flora, reptiles and mammals, including nocturnal species like bats. For solar projects, a detailed hydrological impact study may be necessary, depending on the technology used. Project contracts and legal agreements must specify the requirement to carry out an appropriate assessment. Any EIA must be carried out by qualified persons, and the methodology and EIA be reviewed by an external and independent expert to ensure that it is appropriate. EIA should go above the minimum national standard, to meet internationally appropriate standards.

It is essential that any survey identifying the ecological value of the development's footprint includes the additional area required for construction, and a buffer zone, to allow for any changes in the proposed development and assessment of possible edge effects. The techniques and methods used in undertaking these surveys should be capable of replication as part of a post-construction monitoring programme. BirdLife International is developing guidance material in relation to methodologies and processes when undertaking an appropriate EIA. These materials will be available in the coming months.

The EIA should also consider the ecological needs of the species occurring within the site, and provide recommendations regarding possible mitigation measures, such as leaving or creating habitat corridors, creating complementary habitat, or ecosystem restoration. One option that should be considered is contiguous/compensatory habitat development, to compensate for loss of habitat due to the solar energy development. This should only be considered once the other options within the mitigation hierarchy have been addressed. The compensatory land requires an appropriate management plan to maximise its biodiversity potential.

The ecological data generated by the EIA should be stored in a publicly accessible, centralised information system, which enables strategic analysis and also the generation of greater knowledge. It is essential that the Environmental Management Plan is open to stakeholder consultation, and that a non-technical summary report is also produced in the local language. Financing organisations should ensure this ecological information is freely available, and provide an enabling environment to allow for access. Mechanisms should also be in place to ensure transparency and openness in the consultation processes. Stakeholders should be engaged in the EIA at an early stage, and should continue to be engaged throughout the process.

The EIA will aid in identifying the impacts upon birds and other taxa at the site/project level. It enables specific risks to be addressed and outlines **specific avoidance and mitigation** actions, which will reduce the impact on birds and biodiversity. A robust **baseline survey** is an essential component of any EIA.

The baseline survey should take place for a minimum of one year, covering all four seasons, but three years may be necessary if an area is known to be important for migratory species.

The pre-construction surveys should include:

1. **Breeding bird surveys** to assess the potential footprint and buffer zone impact of a development on resident species;
2. **Vulnerable and protected species-specific survey**s, for species that may need individual assessment, e.g. nationally and internationally important bird, reptile and mammal species, or colonial bird species;
3. **Migratory bird surveys** may be required if the site is along a migratory route. If required, this should include **vantage point surveys** undertaken during migration periods, particularly at or near bottlenecks, and should cover the seasonal variation during a year-long period;
4. **Hydrological Assessments** may be required, depending on the technology used.

Power lines and associated infrastructure

The power line infrastructure which carries the power generated by solar farms to the end user can potentially have a significant impact on birds and bird populations. This impact could be reduced by using appropriate mitigation measures. These measures include the appropriate routing of the lines, use of bird deflectors, and pole design which minimises electrocution risks. The connection of a solar development with the national grid must be considered as part of an impact assessment.

Further details can be found in the BirdLife guidance produced for the region in relation to power lines which is available on the Migratory Soaring Birds website. Routing and mitigation actions should be informed by an SEA and EIA. Development banks and financiers must ensure that the routes, and pole and power line designs, minimise the risks to birds. Within a development, power line cables should be routed underground. New sites should be located close to the existing grid infrastructure, to minimise the amount of additional cables needed.

Construction activities

The construction of the renewable infrastructure has the potential to have a significant impact on biodiversity, in particular resident bird species with territories close to the construction site. These impacts can be reduced by utilising environmentally sensitive construction practices and techniques, including habitat restoration at the site level. Project legal agreements and contracts should specify the need to engage in environmentally-friendly construction techniques, and to limit the use of chemicals on site, and include the appropriate disposal of waste and chemicals post-construction. Enforcement mechanisms must be designed to ensure compliance.

Good construction techniques include (1) minimising any clearing of natural vegetation; (2) implementing adequate measures to control soil erosion and runoff; (3) ensuring proper disposal of all solid and liquid wastes (special attention is needed when using hazardous chemicals); (4) ensuring construction materials come from local and environmentally sustainable sources; (5) restoring cleared areas where feasible. Construction should be timed to avoid times of peak sensitivity, such as during the breeding season or periods of peak migration. Many donors and development banks have specific standards in relation to construction practices, and monitoring should be in place to ensure these standards are being adhered to.

Mitigation Actions

The best way to avoid any potential negative impacts of a solar development on birds and biodiversity is to select an appropriate site.

Mitigation actions for solar developments include:

- Placing of white strips along the edges of the panels to reduce the similarity of panels to water, to deter birds and insects[6];
- Some CSP technologies can use 'dry' cooling technologies. Although more expensive, these can reduce the amount of water extracted from the local environment;
- For CSP technology, reflective surfaces which are parabolic (curved) in shape reduce the likelihood of skyward reflection, whereas flat heliostats have an increased associated risk of being reflective, and therefore potentially attractive to birds;
- Trough receivers should use evacuated glass tubes or similar technology to reduce heat loss, which results in low receiver temperatures which will not burn birds;
- Use fencing and wire grids to ensure evaporation ponds are not accessible to birds and other fauna. This is to reduce the possibility of a) attraction b) drowning c) poisoning;
- Use of translocation to protect the terrestrial species (e.g. reptiles, amphibians) present at a development site during construction and operation. This requires a receptor site with suitable habitat and viable population levels;
- Fencing should not hinder species movements at the site level, and fencing should incorporate bird diverters;
- Minimum clearing of native shrub and plant communities;
- Nocturnal lighting should be kept to a minimum to avoid attracting birds;
- Appropriate management of the space between and beneath solar panels. Good maintenance practices (such as confining vehicular access to defined tracks) can also minimise environmental impacts;
- When developments are sited in degraded land, biodiversity can be improved, but in pristine ecosystems, development will almost certainly be detrimental.

Recent developments within CSP technologies, where sunlight is focussed on a receiver which is very close to the mirror, should be investigated. This design makes it less likely that a bird will fly between the receiver and mirror, reducing the likelihood of heat damage.

Post-construction monitoring

In light of the limited understanding of solar development on birds, post-construction monitoring should be a standard recommendation for any new solar plants that are approved, especially in areas of significance for birds. Funds should be specifically set aside for the completion of this exercise.

A range of surveys are required to assess the potential impact on birds. These should include:

1. Assessment of resident, breeding and seasonal species compared with baseline surveys
2. Vantage point surveys to assess any impacts on soaring birds during intense migration periods or winter movements
3. A minimum of one year's post-construction monitoring, and a review process which provides the ability to react to results of surveys and identified impacts
4. Mortality surveys and carcass searches should also be carried out, at intervals appropriate to scavenger removal rates.

Continuous monitoring generates information on establishing the range and extent of any operational impacts, and will inform the need to adapt mitigation actions and operational procedures within the development. This monitoring should be carried out in a standardised way by recognised qualified individuals. It is critical for a new and developing industry that it undertakes monitoring to identify any potential impacts that may arise. The Before After Control Impact (BACI) approach should be used, to allow comparison with the pre-construction data so that impacts can be readily assessed.

These studies should be scientifically accurate, and be freely available, and be used to inform future developments within the sector. This should be a requirement for the development of all large-scale solar projects. Development banks and financiers should ensure that budgets have been set aside for the post-construction monitoring phase, and that if the impacts are found to be significant on vulnerable or at-risk species, mitigation actions are implemented.

Donor Commitments

BirdLife International, its Partners and its staff are committed to ensuring a lasting sustainable future for all. We welcome investment within the renewable energy sector, and the use of new technologies to deliver low carbon energy. Development banks in particular have shown great foresight in their investments within the sector, and in working with national governments to decarbonise their economies. Within the region, there is a high potential for solar energy. While solar power is believed to be one of the most environmentally friendly sources of energy, a precautionary approach should be used until the long-term impacts of these new technologies are known. This is especially true for technologies which require the use of water.

Every country needs a national planning framework for infrastructure projects, including the strategic development of renewable technologies, which integrates biodiversity considerations. The development of such a framework will be enhanced by the engagement of a wide range of stakeholders, including civil society and private industry. Donor organisations, development banks and financiers, as major funders of infrastructural developments within the region, are well placed to ensure that impacts are minimised. They have a responsibility to guarantee that projects are delivered in a sustainable way and that future generations have access to biodiversity and the natural environment. They should use their experience and knowledge to supply policy design and support to national governments. Increasing capacity within the region will aid in mainstreaming biodiversity, and ensuring lasting sustainable development.

An SEA which integrates bird and biodiversity issues, and includes appropriate ornithological surveys and the use of sensitivity mapping tools, will aid in identifying key areas for development, and reduce any impacts on birds and biodiversity. This SEA is a valuable mechanism in providing input into national development plans. Donors and development banks should provide an enabling environment for the use of SEA, and the mainstreaming of bird and biodiversity concerns, across governments and sectors.

Development banks and financiers must commit to the inclusion of bird and biodiversity concerns within a national EIA framework. An EIA must be carried out for each development. These assessments must include ornithological surveys, and post-construction monitoring is also required to investigate the on-going risks. Contracts and bidding documents should make this a condition of funding, and adequate resources should be set aside for these activities. Any assessment must be carried out by qualified personnel, and be reviewed by external independent experts.

[6] Horvath G, Blaho M, Egri A, Kriska G, Seres I, Robertson B (2010) Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects Conservation biology 24 (6) 1644-1653

Project legal agreements need to reflect agreed solar farm operating standards, which must specify post-construction monitoring and data-sharing, operational curtailment, adaptive management and habitat management, and maintenance operations. Mitigation measures are more likely to be implemented if they have been explicitly described and budgeted-for in project agreements, bidding documents, and contracts. When explicitly stated and conditional, these mitigation safeguards are a core design feature of a good development project. Donor funding should align with the precautionary principle.

Efforts to strengthen social and environmental institutions should be at the centre of any programme or project funding. Capacity building within regional, national and local institutions should be a component of any activity. Developing client ownership is an important concept, and one which will allow the mainstreaming of biodiversity issues across a wide range of sectors. Projects must ensure that national stakeholders, including government and civil society partners, are given the mechanisms to increase learning opportunities and share best practices, both nationally and regionally. Local capacity development in EIA assessments and monitoring will enable future projects to be delivered in a robust and strategic way.

Development banks have a commitment both to the country in which the project is taking place, and the world at large, to deliver projects which minimise their impact on the environment and deliver lasting, sustainable development.

Ensuring that birds and biodiversity are mainstreamed in sector lending and projects will aid in achieving a range of internationally agreed targets which countries have signed up, to including the Achi biodiversity targets.

Development banks have made a commitment to help national governments reach national environmental goals and priorities as set out in the Paris Declaration on Aid Effectiveness, while the Accra Agenda for Action highlighted the need to support country environmental planning systems, and to engage with civil society, increase capacity development, and harmonise mechanisms in relation to assessments. By mainstreaming bird and biodiversity concerns within energy development planning, and ensuring birds and biodiversity are assessed appropriately and mitigation actions are applied, donor organisations will be supporting this process.

BirdLife International recognises that there has been limited research into the impact of solar energy generation on birds and biodiversity, and believes that given the proposed expansion within the sector, more research and in-depth analysis is needed to inform the sector and future developments.

More details on the Migratory Soaring Bird Project can be found on the link below. Specific guidance in relation to wind energy, power lines and solar energy is to be published, and a sensitivity mapping tool is being developed and will be available over the coming months.

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