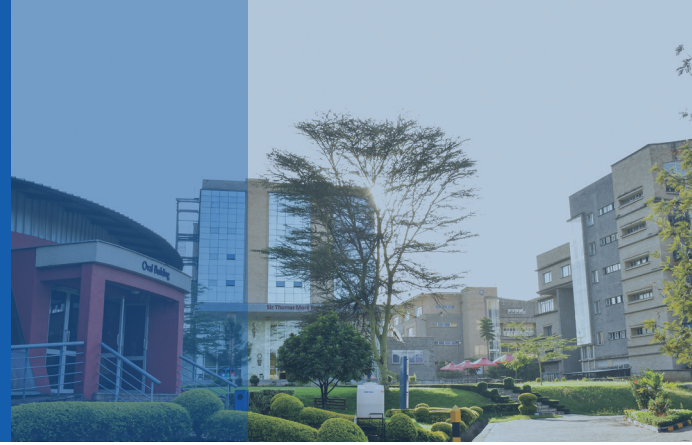




POLICY BRIEF

POLICY BRIEF NO. 04 (2025)



POWERING PROGRESS, PROTECTING WILDLIFE: POLICY OPTIONS FOR KENYA'S ENERGY INFRASTRUCTURE

Peggy Ngila, David Chiawo

Executive Summary

Kenya has made major strides in expanding electricity access, with renewable energy central to its development and climate agenda. Solar, wind, and transmission infrastructure are expanding rapidly, reflecting global and national commitments to decarbonization. However, this progress brings unintended ecological risks. Power lines and wind farms cause bird electrocutions, collisions, and habitat fragmentation. This threatens vulnerable species such as raptors, bustards, flamingoes, and cranes. These impacts are well-documented globally but remain largely absent from Kenya's wildlife and energy policy frameworks.

Drawing on recent assessments and reports of bird mortality associated with transmission lines and renewable energy sites in Kenya, this policy brief shows that infrastructure-related bird deaths are an emerging but overlooked challenge. The omission leaves biodiversity unprotected and exposes the energy sector to avoidable financial losses from bird-related outages. Current strategies emphasize human-wildlife conflict, poaching, and habitat degradation, but overlook the risks from infrastructure growth. With Kenya's energy

masterplan envisioning continued network expansion and regional interconnections, this policy gap could undermine conservation gains and international obligations under the Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention on Biological Diversity (CBD), African-Eurasian Migratory Waterbird Agreement (AEWA), and the Paris Agreement.

This policy brief highlights the urgency of integrating bird-safe infrastructure into Kenya's policy landscape. It outlines policy options and concrete recommendations, such as amending the Wildlife Act and Energy Act, establishing cross-sectoral coordination, mandating mortality monitoring, and mobilizing funding for mitigation. This will ensure that Kenya's renewable energy future is both climate-smart and biodiversity-safe.

The policy brief is informed by a study conducted between 2021 and 2024 to assess electrocution and collision hotspots in Kenya. The study was led by Strathmore University's Centre for Biodiversity Information Development and examined the impacts of electrocution on raptors.

Keywords: Renewable energy, ecological risks, vulnerable species, wildlife policy, electrocution and collision

Introduction

The International Energy Agency (IEA) projects that renewable power must triple by 2030 to meet global climate goals. Rapid progress is already evident: solar panel costs have fallen by 90% since 2010, overhead power line networks continue to expand, and offshore wind now delivers exceptional capacity factors. These advances raise a crucial question: What ecological trade-offs accompany this energy transition?

Overhead power lines affect bird life in three major ways. First collisions occur when birds in flight strike power lines due to the risks influenced by weather, visibility, and proximity to key habitats or migratory routes. Second, electrocutions happen when birds perch on wires and complete electrical circuits. Third, power lines can degrade and fragment habitats by cutting across open landscapes and vital bird areas, often leading to avoidant behaviour.

In Africa, electrocution and collision incidents have been documented in Sudan, South

Africa and Kenya. Bustards, flamingoes, raptors, and cranes are among the most affected species. International policies, such as CMS, have acknowledged these risks. However, their integration into Kenya's energy and wildlife conservation policies is limited. Over the past 12-15 years, Kenya has experienced the most rapid expansion of electrical infrastructure in East Africa. Electricity access more than doubled between 2013 and 2018, rising from 26% to 77% under the Kenya Power and Lighting Company (KPLC). In its 2023-2042 Master Plan, the Kenya Electricity Transmission Company (KETRACO) reaffirms the country's commitment to sustainable energy. This growth underscores the urgent need for integrated conservation strategies to mitigate biodiversity impacts linked to power infrastructure.

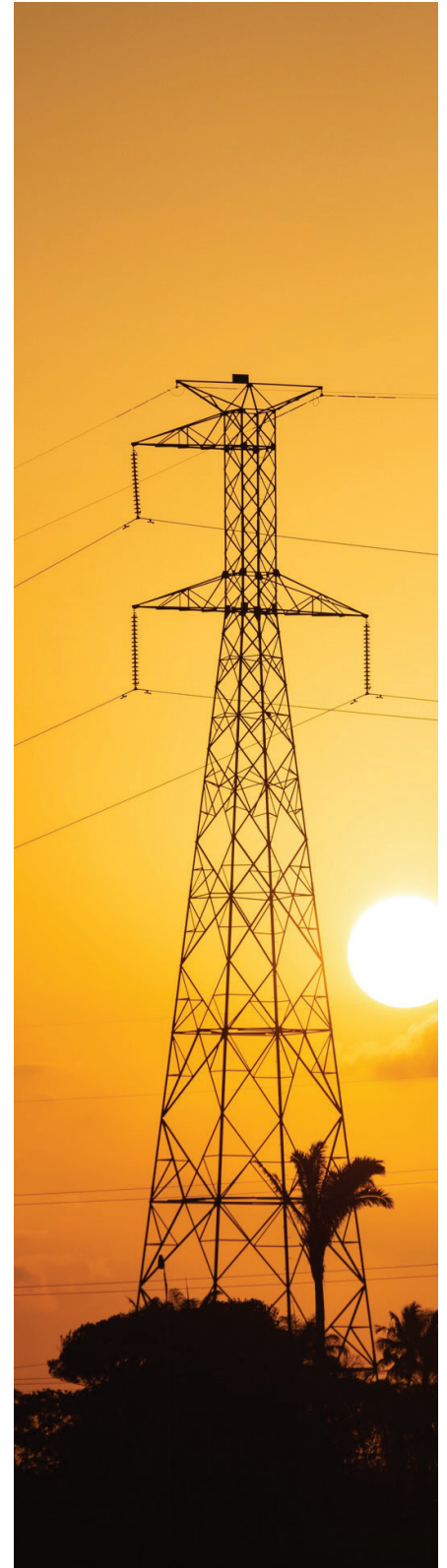
Problem Statement

Electrocution and collision risks are a big threat to bird species in Kenya, particularly where expanding energy infrastructure overlaps with critical habitats. These fatal incidents not only endanger vulnerable bird populations, especially slow-reproducing species such as raptors, but also disrupt electricity supply, and cause costly outages for providers and distributors. Without targeted mitigation, such impacts risk accelerating avian population declines while undermining the reliability of Kenya's energy sector.

Key results

1. Limited attention to infrastructure threats: While most policies highlight threats such as human-wildlife conflict (HWC), poaching, climate change, habitat loss, and invasive species; very few address the impacts of infrastructure. Only the 2020 Wildlife Strategy mentions infrastructure impacts, but without specific reference to electrocution and collision risks from power lines or wind turbines.
2. Gaps in major energy and environmental policies: Key documents, including the National Energy Policy, the Energy Act, the Climate Change Act, and the Environmental Management and Coordination Act (EMCA), do not address risks to birds from energy infrastructure.
3. Broad but incomplete conservation strategies: The Wildlife Conservation and Management Act, Wildlife Policy, Wildlife Strategy, Wetlands Policy, National Biodiversity Strategy and Action Plan, and National Environmental Policy propose measures for HWC mitigation, poaching reduction, species conservation, and ecosystem restoration. However, none explicitly mentions electrocution or collision threats.
4. Commitments lack integration: Kenya has made strong commitments under the Convention on Migratory Species and the African Convention on the

Conservation of Nature and Natural Resources. Yet, these commitments are not well integrated into national policies guiding energy development (Table 1).



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Policy Document	Provision/Statement	Policy Action Score (O-VI)
African Convention on the Conservation of Nature and Natural Resources, Revised 2003	Recognizes the protection of migratory species and habitats through protected areas and conservation measures. Calls for regular reviews to monitor and protect species, including migratory species, but lacks mention of electrocution and collision threats.	II
Wildlife Conservation and Management Act, 2013	Recognizes the importance of preserving wildlife buffers, migration corridors, dispersal areas and zones. Emphasizes conserving habitats and preventing harmful infrastructural activities. Addresses HWC, mandating mitigation mechanisms in collaboration with community wildlife associations.	II
Forest Conservation and Management Act, 2016	Emphasizes the conservation of biodiversity, including threatened or endangered species, and the preservation of biological diversity in forests.	I
Energy Act, 2019	Lacks provisions for wildlife conservation, migratory species and electrocution or collision issues.	O
Wildlife Policy, 2020	Recognizes commitments to multi-sectoral environmental agreements such as the CMS and highlights the importance of regional and international cooperation in wildlife conservation as crucial for migratory species.	II
Wildlife Strategy, 2030	Acknowledges threats to wildlife populations such as habitat loss, human population pressure and poaching.	O
Wetlands Policy, 2014	Acknowledges the importance of wetlands as habitats for various plants and animals, including endemic, endangered and migratory species. Highlights wetlands' critical role in biodiversity conservation and their function as breeding and spawning areas for fish and water birds, acting as in situ genetic resource banks.	I
Kenya Climate Change Act, 2016	Recognizes the importance of integrating climate change considerations into various sectors and aspects of governance.	O
Environmental Management and Coordination Act, 1999	Recognizes the need to monitor the impacts of wildlife and to stop the introduction of alien invasive species.	O
National Biodiversity Strategy and Action Plan, 2019-2030	Recognizes commitments to international treaties for conserving migratory bird species and stresses coordinated efforts at national and global levels. Recognizes national parks, reserves, wildlife sanctuaries, monuments, Biosphere Reserves, World Heritage Sites and Ramsar Sites as vital for wildlife conservation.	II
National Energy Policy, 2018	No explicit mention of electrocution and collisions due to power lines.	O
National Environment Policy, 2013	Recognizes wildlife conservation as essential for environmental protection and sustainable development. Emphasizes wildlife's economic contributions through employment, revenue generation and wealth creation. Underscores threats to wildlife, including HWC, pollution, climate change and habitat loss, stressing the urgency of conservation efforts.	I

Table 1: Summary of provisions and statements in the surveyed policy documents

Key:

O - No explicit mention I - Mention of this aspect without further statement II - Mention broadly of this aspect but suggesting further research necessary III - Objectives set but without further actions identified IV - Objectives and corresponding measures proposed for this aspect V - Objectives and measures proposed for this aspect, with respective details for implementation provided, including entities responsible VI - Objectives, measures and explicit details for implementation, with defined targets and associated monitoring and evaluation procedures (Source: Crona & Rosendo, 2011).

Policy Options

1. Reform conservation and energy policies to address infrastructure threats

Due to the absence of electrocution and collision risks in Kenya's biodiversity and energy frameworks, immediate reforms should be implemented to integrate wildlife safeguards into the Wildlife Act, National Biodiversity Strategic Action Plan (NBSAP), and energy licensing processes. These reforms will not only align conservation with Kenya's constitutional duty to protect biodiversity but also reduce financial losses from bird-related power outages and enhance energy security.

2. Mandate bird-safe infrastructure standards

Power utilities and renewable energy developers should be legally required to adopt bird-safe technologies such as line insulation, strategic pole design, and line marking. Embedding these standards in the Energy Act and EMCA will de-risk investments by reducing outages, demonstrate climate-responsiveness, and strengthen Kenya's leadership in sustainable infrastructure development.

3. Institutionalise cross-sectoral coordination

Establishing formal mechanisms for collaboration between the Ministry of Energy, Ministry of Tourism and Wildlife, National Environment Management Authority (NEMA), and conservation partners will ensure that infrastructure expansion and biodiversity protection are not treated in isolation. This will build public trust, foster transparency, and

promote equitable, inclusive development outcomes.

4. Strengthen research, monitoring and accountability systems

Introducing mandatory monitoring of avian mortality, backed by transparent reporting requirements, will create accountability for energy institutions while also informing adaptive management. This evidence-driven approach will close the policy-practice gap, build resilience against climate change, and uphold constitutional values of sustainable development.

Policy Recommendations

1. Amend the Wildlife Conservation and Management Act and related frameworks

Kenya should revise its wildlife and biodiversity strategies to explicitly address electrocution and collision risks from energy infrastructure. This will align national policy with the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Convention on Biological Diversity (CBD), while fulfilling constitutional obligations under Article 69 on environmental stewardship.

2. Update the Energy Act and EMCA to require bird-safe designs

All new and retrofitted energy infrastructure - including transmission lines, distribution poles, and wind farms - must comply with internationally recognised bird-safe standards such as APLIC guidelines. Embedding this into the Energy Act (2019) and EMCA (1999) will reduce avian

outages, and demonstrate Kenya's leadership in delivering SDG 7 (Affordable and Clean Energy) and SDG 15 (Life on Land) in an integrated way.

3. Establish a cross-sectoral coordination platform

A joint task force bringing together the Ministry of Energy, Ministry of Tourism and Wildlife, KETRACO, KPLC, NEMA, academia and conservation partners should be institutionalised. This mechanism would harmonise national policies with the African Union's Agenda 2063 vision of sustainable infrastructure and ensure that renewable energy expansion is consistent with biodiversity conservation targets under the Global Biodiversity Framework.

4. Introduce mandatory monitoring and reporting of bird mortality

Energy providers should be legally obligated to monitor, document, and publicly report electrocution and collision incidents. Reporting should be aligned with Kenya's obligations under the CMS and AEWA (African-Eurasian Migratory Waterbird Agreement), ensuring transparency, evidence-based decision-making, and integration of biodiversity indicators into Kenya's Nationally Determined Contributions (NDCs) under the Paris Agreement.

5. Mobilize funding for mitigation and community engagement

Kenya should leverage public-private partnerships, the Green Climate Fund, the Global Environment Facility (GEF), and conservation trust funds to retrofit dangerous infrastructure, deploy bird

diverters, and expand community-based monitoring. Embedding these measures within climate finance frameworks will de-risk private investment, support SDG 13 (Climate Action), and strengthen local stewardship of biodiversity corridors and habitats.

Conclusion

Kenya's transition to renewable energy offers immense opportunities for climate action, economic growth, and improved energy access. However, the risks of bird electrocution, collision, and habitat fragmentation linked to expanding energy infrastructure remain largely invisible in current policy frameworks. This omission threatens not only vulnerable species, including raptors and migratory birds, but also the reliability of electricity supply and the financial sustainability of energy providers.

Bridging this gap requires coordinated action across government, energy providers, academia, and conservation partners. By mainstreaming bird-safe infrastructure into energy and environmental policies, Kenya can align its development trajectory with its obligations under the CMS, CBD, AWEA, Paris Agreement, and the African Union's Agenda 2063. Addressing these risks now will ensure that Kenya's renewable energy future is both climate-smart and biodiversity-safe; a win for nature, communities, and sustainable development.

References

- APLIC. (2006). Suggested practices for Avian Protection on Power Lines: The State of the Art in 2006.
- Crona, B., & Rosendo, S. (2011). Outside the law? Analyzing policy gaps in addressing fishers' migration in East Africa. *Marine Policy*, 35(3), 379–388. <https://doi.org/10.1016/j.marpol.2010.11.003>
- Ngila, P. M., Chiawo, D., Ellwood, E. R., & Owuor, M. A. (2024). Analysing policy gaps in protecting avian species from electrocution and power-line collision in Kenya. *Environmental Conservation*, 51(4), 290–294. <https://doi.org/10.1017/S0376892924000249>
- Smallie, J., & Virani, M. Z. (2010). A preliminary assessment of the potential risks from electrical infrastructure to large birds in Kenya. *Scopus*, 30, 32–39.
- USAID. (2016). Development of Kenya's power sector 2015-2020. www.usaid.gov/powerafrica



About the Authors

Peggy Ngila is a research fellow at Strathmore University's Centre for Biodiversity Information Development. She has wide knowledge in biodiversity and ecological conservation of avian species. She has worked on topics related to understanding threats to birdlife such as electrocution and collision, forest loss, urbanisation and climate change.

David Chiawo is the lead scientist at the Centre for Biodiversity Information Development. He has expertise in biodiversity conservation, climate change adaptation and resilience, natural resource management, ecosystem services, community-based conservation, sustainable tourism, land-use change, and science-policy nexus.

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Madaraka Estate

Ole Sangale Road

P.O Box 59857-0200

Tel 0703-034200

Email: research@strathmore.edu



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