



Urban Agenda Platform

The global platform for sharing progress, action and knowledge on the implementation of the New Urban Agenda to achieve sustainable urban development.

Improving power distribution in South Africa by addressing wildlife interactions with electrical infrastructure

Region	Sub-Saharan Africa
Award Scheme	Dubai International Award
Themes	Resilience & Risk Reduction
Start Year	2017
Sustainable Development Goals	Goal 7 - Ensure access to affordable, reliable, sustainable and modern energy for all Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable Goal 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
New Urban Agenda Commitments	Environmentally Sustainable and Resilient Urban Development Sustainable and Inclusive Urban Prosperity and Opportunities for All

Summary

Energy infrastructure is critical to economic development. South Africa is a vast country whose national electrical infrastructure, in the form of power lines, runs to over half-a-million kilometres. While the national grid is critical to electricity supply, it also represents a threat to the country's rich biological diversity. Most threatened are a number of large birds, including endangered species, which are killed through collision or electrocution with electrical infrastructure.

Background and Objective

South Africa has a rich history of wildlife conservation. Even so, electrical infrastructure – including power lines – was decimating wildlife, including endangered species. This affected wildlife, damaged power infrastructure and negatively impacted end-users. Infrastructure costs alone exceeded almost US\$ 100-million annually, with immeasurable knock-on effects for the economy.

Actions and Implementation

We use a variety of techniques – many developed in-house – to tackle wildlife electrocution incidents, including covering exposed jumpers on transformers, changing pole configurations to make them more bird-friendly, cutting a gap in the earth wire, or fitting raptor protectors to live phases. For collision incidents, we generally fit bird flight diverters to the spans on a power line or, in extreme cases, recommend that Eskom re-routes a line or even removes it in exceptional cases. We track each reported incidents to ensure Eskom conduct their work both timeously and correctly. Once an upgrade is completed, we officially close the incident out. We then conduct an annual audit to confirm that Eskom did take the required action, and did so as stipulated. Our biggest ongoing challenge is working towards a completely wildlife-friendly electrical network. The historical electrical infrastructure we inherited constantly challenges us given that it was constructed using decidedly wildlife unfriendly designs. This has caused an alarming number of wildlife deaths to date, despite our work. Rectifying this will take a considerable amount of resources and effort. We have focussed on this process since 2016, when we compiled detailed sensitivity maps for both Eskom Distribution and Transmission networks. We now use these maps to indicate the most sensitive areas where bird and energy infrastructure interactions are likely to take place. This has allowed us to roll out detailed, proactive plans across all divisions within the utility. Some of the key objectives of this proactive strategy are to create a cultural shift within the utility's business, to influence line design, route planning, asset selection and application, operations and maintenance, and embedding smart work practices to use all possible opportunities during operations and maintenance to ensure that infrastructure is made wildlife friendly. Engineers, technicians and environmentalists are now all working together towards a single goal that will ultimately lead to the transformation of the entire electricity network to the benefit of wildlife, Eskom and end-users who are affected by wildlife-related power outages from urban centres to extremely remote rural locations.

Outcomes and Impacts



Urban Agenda Platform

The global platform for sharing progress, action and knowledge on the implementation of the New Urban Agenda to achieve sustainable urban development.

Given the tangible success of our partnership, we are now talking to power utilities through southern and East Africa, as our project will, in the longer term, lead to a significant reduction in electrical outages (with a measurable benefit to industrial and domestic consumers). These will be realised through a reduction in damage to electrical infrastructure that can be attributed to wildlife incidents. From a financial perspective, power utilities can expect to reap tangible financial benefits, reducing the multi-million dollar bill for repairing structures damaged by wildlife, and revenue losses suffered due to outages. This fiscal benefit alone is enough to illustrate the economic sustainability of our work. From an environmental perspective, the project makes a major contribution to the survival of several highly threatened and charismatic species of wildlife including the Cape Vulture, Wattled Crane, Ludwig's Bustard and Lesser Flamingo. The partnership has also led to the establishment of Eskom's Biodiversity Centre of Excellence, which will ensure that we achieve a long-term, positive impact on biodiversity management. The partnership continues to demonstrate a business case to the utility, which guarantees a reduction in power supply interruptions and simultaneously reduces biodiversity-related impacts. As our partnership enters its twenty-first year, we have integrated industry best practice and biodiversity conservation into Eskom's business, policies and procedures, and culture. The Eskom/EWT strategic partnership has evolved over the years to include other facets of the business, including power generation and renewable energy elements. Eskom has now identified the need for the EWT to assist in the management of biodiversity in and around power stations across South Africa. Activities will include the design of biodiversity management plans for all power stations, game management, alien plant management, rehabilitation of ash dams, management of wildlife interactions at power stations, and advising on all biodiversity related issues.

Innovative Initiative

Finding a mutually beneficial working relationship, which serves the interests of both the national power utility and those of wildlife conservation, was an important lesson in catalysing the growth and impact of our partnership. We have built the partnership on a model of mutual trust and cooperation, as well as the integration of engineering and environmental skills, to develop and implement solutions that serve both partners. A reactive response to biodiversity related incidents only addresses a portion of this impact. While this may reduce future wildlife mortalities, it does not address the underlying symptoms of these problems. A critical lesson we learnt was to develop a more strategic, proactive approach to fully address the impact of electrical infrastructure on biodiversity. From a business perspective, our proactive approach prevents costly damage to hardware, outages, revenue loss and costs related to call outs. We were also unaware of the level of environmental illiteracy, amongst both Eskom staff and the public, resulting in low reporting rates of wildlife incidents. This key lesson allowed us to increase awareness to all stakeholders of the importance of wildlife and reporting wildlife-related incidents. Given this insight, we have increased our awareness campaigns, and ramped up our training interventions and engagement with utility staff. We have also learnt that it is important to stay up to date with all the latest technological developments and mitigation methods to continuously improve the way we address wildlife and electrical infrastructure interactions. So with the improvement of new electricity generation technology, we are now also addressing emerging threats to wildlife in the form of renewable energy facilities (primarily solar and wind), through intensive monitoring and pioneering research at renewable energy sites.

Conclusion

The main government policy driver behind the formation of our partnership is South Africa's National Environmental Management Act 62 of 2008 (NEMA). We address the principles in NEMA, which state that environmental management must be integrated into decision-making. More specifically, the need to take into account the effects of decisions on all aspects of the environment, and all people in the environment, by pursuing the best practical environmental option. Through NEMA, the partnership has influenced a number of Eskom's internal policies relating to screening documents for new power lines, guidelines related to infrastructure design, as well as business processes and how these relate to environmental management. We have developed a number of decision-making tools that can be applied during wildlife interactions, incident investigation processes, mitigation guidelines as well as audit procedures. Furthermore we have designed and tested mitigation products which are incorporated into technical bulletins as acceptable in the business.