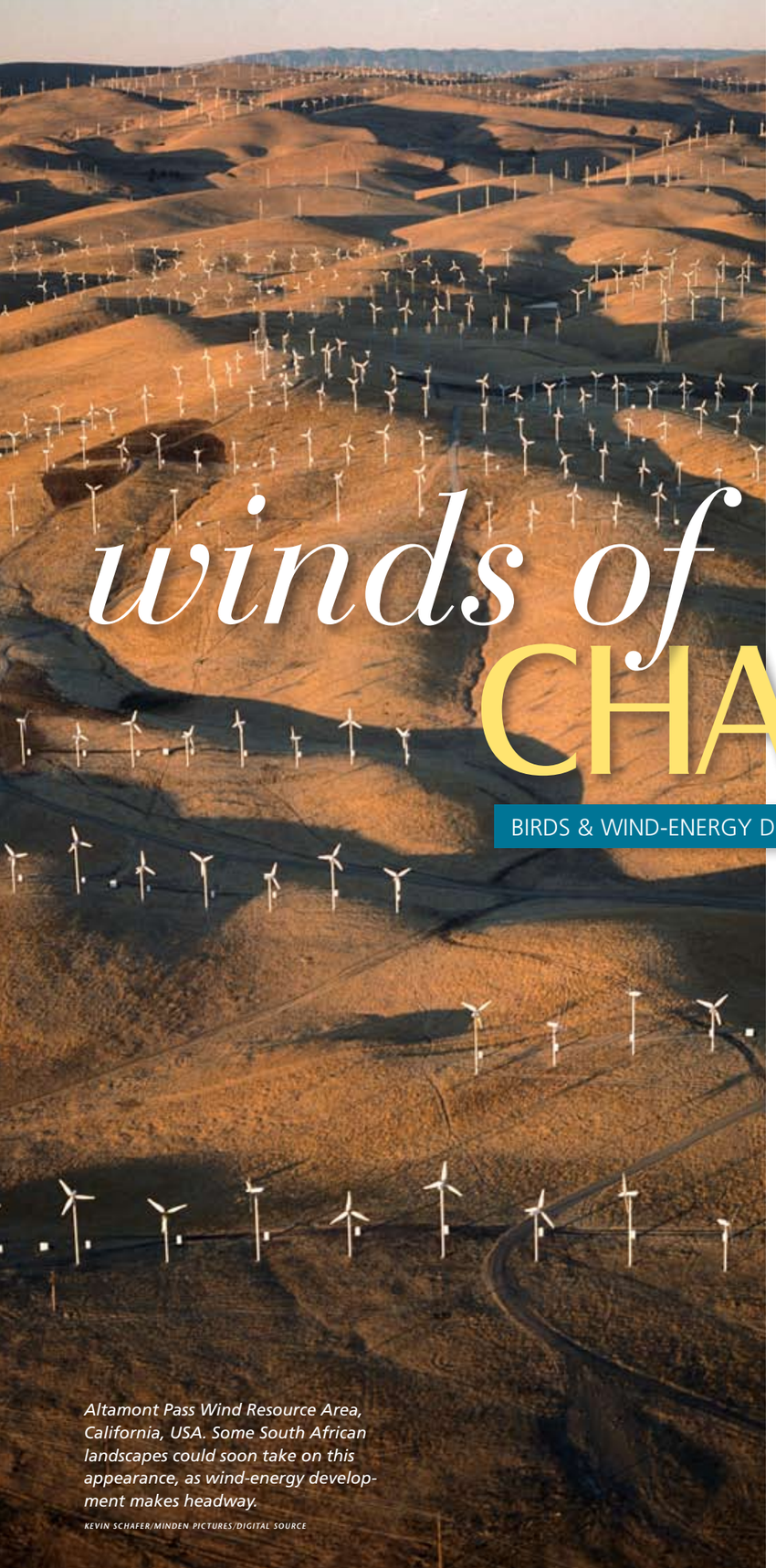

Altamont Pass Wind Resource Area, California, USA. Some South African landscapes could soon take on this appearance, as wind-energy development makes headway.

KEVIN SCHAFER/MINDEN PICTURES/DIGITAL SOURCE

winds of CHANGE

BIRDS & WIND-ENERGY DEVELOPMENT IN SOUTH AFRICA

TEXT BY ANDREW JENKINS

The energy requirements of the planet's burgeoning human population are increasing exponentially and our capacity to service them is lagging far behind. Traditional forms of energy generation, which require that we source and burn fossil fuels, are not commercially, practically or environmentally sustainable in the longer term. Our natural environment provides free, constant and inexhaustible supplies of energy, in the form of wind, waves and sunlight.

With these simple facts on the table, you don't have to be the proverbial rocket scientist to work out that the global shift towards harnessing natural, renewable energy sources is both logical and necessary. In Africa, this move is long overdue. While many countries across the world are well advanced in the process of exploring and exploiting their renewable energy reserves – the USA and Western Europe have histories of wind-energy development going back decades – Africa has been on the sidelines, scratching its head and debating the odds. But things are changing fast.

South Africa is at the sharp end of what promises to be an African energy renaissance. This country's history has affected its infrastructural development to a degree that the chasm between projected energy demands and current generation capacity is even greater than in most other places. Many local experts feel that an energy crisis is looming. However, the recent relaxation of the State's monopoly on power production has opened the door to the private sector and has finally seen the birth of a South African renewable energies industry.

Although in sunny South Africa solar power would seem to be the obvious alternative energy solution, it is wind power that has been the focus of attention so far. Many readers will know already that generating electricity from wind involves the use of massive turbines, erected on huge towers and turned by the wind's action on giant, rotating blades. Not surprisingly, these contraptions have their detractors and issues around noise and aesthetics dog the wind-energy industry, forcing developers to look for relatively remote sites where there are fewer people to see and hear the turning blades. This has the effect of broadening the interface between wind-energy development and the natural environment, and exaggerates the potential conflict between wind farms and birds.

A number of influential studies have clearly demonstrated negative effects of wind farms on birds. Some breeding species may be disturbed or displaced by the action and noise of the turbines; some commuting or migratory species may be forced to make energetically expensive detours around the barriers presented by large facilities; and, most dramatically, some species may be prone to fatal collisions with the turbine blades. The biology of these effects is still unclear and it remains very difficult to predict exactly which species will be impacted by a new wind farm, or how.

The location of the facility in the surrounding landscape seems to be an important factor, with wind farms situated along prominent ridges perhaps more likely to incur high collision rates than those placed in flat landscapes. Some bird groups seem to be more susceptible to detrimental effects than others. For example, the tendency of slope-soaring birds like vultures, eagles and falcons to actively seek out the same accelerated air currents that make ridge-top turbines so productive brings them directly into the danger zone.

It is important to note that of the many operational commercial wind farms around the world, relatively few have proved to pose serious problems for the local avifauna, and some of the worst statistics come from older facilities. A massive wind farm at Altamont Pass in California, for example, is notorious for its impact on raptors. Altamont dates back to the 1980s and includes many small, old-fashioned turbines, with whirling blades set atop lattice-built towers, more similar to conventional windmills than the soaring, smooth-sided tubular towers that typify modern designs. These prototype turbines have proved hazardous for raptors, mainly because they provide ideal hunting perches when the wind isn't blowing, luring birds into the arc of the blades – a dangerous place to be once the wind gets up.

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Altamont has other issues. It is located along a series of prominent ridges, on a raptor migration route and in an area that supports abundant prey for various species – a cocktail of factors that has had sad consequences for the region's birds of prey. Even though some attempts have been made to retrofit old turbines and to isolate and shut down particularly problematic machines, the 5 400 turbines (of mixed age and design) that comprise today's Altamont Pass Wind Resource Area continue to kill more than 2 700 birds each year, including more than 60 Golden Eagles and over 1 100 other raptors.

It's not just ageing facilities in the United States that are causing problems. A handful of more modern terrestrial wind farms (out of many hundreds) in both North America and across Europe are still registering significant impacts on birds, particularly in southern Spain, where Griffon Vultures have been badly affected, and in Norway, where a coastal population of White-tailed Eagles has been depleted.

A concerning feature of at least some of the wind farms where birds have been adversely influenced is that they were built despite strongly negative specialist inputs to the environmental impact assessment process, and sometimes even in direct contravention of legislation designed to protect the threatened species likely to be worst affected. This smacks of yet another of those 'inconvenient truths': that although wind and other renewable energy industries are conceptually very eco-friendly alternatives to the *status quo*, the commercial imperatives driving their development can be as blind as any other big business to the need to proceed sustainably.

Does the imminent expansion of the wind-energy industry in South Africa pose a threat to the region's birds? The truth is that we don't really know, because we have no full-sized wind farms of our own from which to gauge the implications of these facilities becoming more widespread. Certainly we have a wealth of potentially susceptible and already threatened birds: heavy, slope-soaring species like the Cape Vulture, large terrestrial birds like the Blue Crane and Ludwig's Bustard, nomadic wetland ones such as Greater and Lesser flamingos and Great White Pelican, and localised endemic raptors such as the Black Harrier. All these species have distributions that overlap substantially with the areas where the industry is already focusing its efforts.

The planned extent of development is considerable. Currently there are more than 50 wind-energy projects in the pipeline in South Africa, ranging from small plants of only 10 to 20 turbines to very large concerns made up of hundreds of turbines and covering thousands of hectares. Put into perspective, South Africa's present power-generation capacity from all sources (but primarily coal-fired power stations) is approximately 45 000 megawatts. About 6 000 megawatts of wind energy is under review right now, and the South African Wind Energy Association (SAWEA) forecasts that about 30 000 megawatts should be on line within the next 15 years. So wind is going to be a significant ▷

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Eskom's demonstration wind-energy facility at Klipheuwel in the Western Cape comprises only three turbines and is one of just three (very small) operational wind farms in South Africa at present.

player in the country's energy budget, and the western and southern coastal plains and the eastern Karoo landscapes in particular are going to look very different in a few years' time.

It's worth reiterating that of the multitude of wind-energy facilities operational across the world, very few have been shown to be seriously detrimental to birdlife. This may be partly because levels of monitoring and research at many installations have not been sufficient to register possible impacts. Signs of displacement, in which birds are denied access to important resource areas by their aversion to the movement and noise of the turbine blades, are also less obvious. But for the most part, this apparently good track record can probably be ascribed to more careful planning that has resulted in new wind farms being sited away from bird-sensitive areas.

Can we achieve a similar level of success in managing the bird–wind farm interface in South Africa? Yes, provided that the industry is prepared to acknowledge bird impacts as an important component of the roll-out process. It needs to be appreciated that we don't yet know which birds (if any) are likely to be affected, and how, where or why, so we must proceed as cautiously as possible. We have the opportunity to influence the nature of the industry right from the start, which is a huge bonus, and we have the benefit of being able to draw on all the published experience of wind-energy development in other parts of the world.

Unfortunately, the way in which the introduction of renewable energy to the South African market has been managed so far has created a severe demand bottleneck (only 400 megawatts of wind energy will be purchased in the initial phase), and caused fierce competition among would-be operators. This has resulted in a mad rush to be first in the vendors' queue. Land acquisition and project design are going forward at breakneck speed, and huge pressure is being placed on consultancies and the Department of Environmental Affairs (DEA) to produce and approve environmental impact reports as quickly as possible. It's not the best start!

In a move intended to counteract the chaos and corner-cutting that have threatened to undermine the environmental credibility of the emergence of wind energy in this country, BirdLife South Africa and the Wildlife and Energy Programme of the Endangered Wildlife Trust (EWT) have hosted workshops with industry role-players and with ornithologists and specialist consultants. The objective of these meetings was to establish critical channels of communication and draw lines in the sand prescribing a more tenable way forward.

Happily, they seem to have achieved some success, and with the DEA on board there should be more control over how bird issues are prioritised. A positive spin-off has been the recent formation of the Birds & Wind Energy Specialist Group (BAWESG) and the Birds & Wind Energy Forum (BAWEF).

BAWESG is a small grouping of BirdLife South Africa and EWT staff and a couple of independent consultants and academics, who have been tasked initially with developing an avian sensitivity map for wind-energy development in the region. The group will also draw up protocols for monitoring bird populations at proposed development sites and design a research programme to help us understand the biology and long-term implications of the proliferation of wind farms.

BAWEF, which includes representatives from the wind-energy industry and government, will bring conservation and corporate interests to the same table. As the means by which the products of BAWESG and the concerns of both SAWEA and the DEA are disseminated and discussed, it will help to find solutions and adopt them.

Wind energy is coming to southern Africa, and it will form an important part of our power-generation capacity in the near future. Left unmanaged, this industry certainly has the potential to impact negatively on already threatened elements of the region's avifauna. BirdLife South Africa, the EWT and SAWEA, together with BAWESG and BAWEF, are hopeful that this eventuality can be avoided, to the satisfaction of all concerned and to the benefit of our birds. □

Andrew Jenkins is a member of BAWESG.