

# THE WAKE EFFECT *September 2020*

By ALISTAIR YOUNG AND NICOLE KRUGER, Published in *Environmental Law Feature*

With rolling blackouts and load shedding schedules becoming a permanent feature in the lives of South Africans, it is clear that we are in dire need of a substantial increase in energy generated from sources other than coal. One such alternative source is that of wind energy. The harnessing of the wind's energy to generate electricity is a relatively new form of power generation in South Africa. Currently there are approximately 24 separate wind energy facilities, which have a total of 2 078MW of wind generation.

According to the Integrated Resource Plan of 2019 (the IRP), the Department of Mineral Resources and Energy (DMRE) needs to identify and approve wind energy facilities capable of generating an additional 14 400MW of wind power by 2030. It is estimated that, without taking into consideration further advancements in turbine technology, at least 5 000 new wind turbines of 2,5MW each will have to be installed throughout South Africa to meet the IRP's current 2030 target for total installed wind generation capacity.

To assist relevant stakeholders with the process of identifying, approving and ultimately generating the required additional wind power, there have been various legislative developments within the renewable energy sphere in recent years. Notably, eight Renewable Energy Development Zones (REDZs), optimal areas for the development of wind and solar energy facilities, were identified by the Department of Environment, Forestry and Fisheries (DEFF) on 16 February 2018. These zones represent the areas in South Africa that are currently most suitable for the development of large-scale wind and solar energy projects based on their proximity to existing electricity transmission and distribution infrastructure, and the availability of optimal renewable energy in the form of wind and sunlight. The added benefit associated with the declaration of the REDZs is the significantly truncated time periods for the mandatory basic assessment environmental authorisation application process within the REDZs. More recently, the Minister of Forestry, Fisheries and the Environment (Minister Creecy) published a number of draft notices for public comment that are aimed at easing this process even further. For instance, it is clear from a draft notice published on 17 July that Minister Creecy intends to establish three additional REDZs in Emalahleni, Klerksdorp and Beaufort West.

The establishment of the REDZs is, in principle, to be welcomed. However, the anticipated proliferation of wind energy facilities and associated turbines within the REDZs, and in other suitable wind rich regions of South Africa to satisfy the IRP targets, could have unintended consequences. These consequences are commonly referred to as wake effect and turbine turbulence, and can occur when wind energy facilities are located in close proximity to one another. Both wake effect and turbine turbulence can occur when a new wind energy facility is established upwind of an existing wind energy facility. Wake effect is the phenomenon that can occur when the new upwind wind energy facility is first in line in receiving and capturing the available wind resource, thereby possibly reducing the quantity of wind available to the downwind facility and, concomitantly, the energy production capabilities of such a facility. The new upwind facility may also have an impact on the quality of the remaining wind available to the downwind facility to the extent that, as the wind passes through the turbine rotors of the upwind facility, the flow of the remaining wind becomes more turbulent. The more turbulent wind may result in mechanical wear and tear and, therefore, increased maintenance on the turbines of the downwind facility. The result may be possible additional downtime and may even result in a decrease in the expected longevity of the turbines.

The legal issues and consequences associated with wake effect and turbine turbulence have been the subject of legal action in various international jurisdictions which have long-established

renewable energy programmes. While the impacts of wake effects and turbine turbulence have not yet been the subject matter of judicial consideration in the country, and despite the relatively limited number of wind energy facilities in the country, they are now being raised by the owners of downwind energy facilities in their legal opposition to the granting of environmental authorisations for the development of proposed new nearby and upwind facilities.

In 2018, South Africa Mainstream Renewable Power Developments (Pty) Ltd (Mainstream) lodged appeals with the DEFF against its granting of environmental authorisations for the proposed development of the 390MW San Kraal and the 275MW Phezukomoya wind energy facilities. In Mainstream's opinion, the proposed wind energy facilities were going to be located upwind of their existing Noupoot wind energy facility. Although the wake effect impacts on the Noupoot facility had been assessed, former Minister Mokonyane reasoned, when dismissing the appeals, that "wake impacts have no environmentally associated impacts" that would affect Mainstream and therefore she had no legal mandate to determine the influence of the wake effect impacts the two proposed projects would have on the existing Noupoot facility.

In 2019, Grassridge Wind Power (Pty) Ltd (Grassridge) lodged an appeal against the decision by the DEFF to grant Bayview Wind Power (Pty) Ltd (Bayview) an environmental authorisation to develop a proposed 140MW wind energy facility. Grassridge argued that during its environmental authorisation application process, Bayview failed to assess the wake effect impact the proposed wind energy facility would have on its existing downwind facility and that a wake effect impact assessment report should have been undertaken. In support of this view, Grassridge referred to the Constitutional Court case of *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others* CCT 67/06 [2007] ZACC 13. *In casu*, it was held that socio-economic factors can have an impact on the environment and economic factors are, therefore, a relevant consideration in the sustainability enquiry by the competent authority. In response, Bayview submitted that the impacts associated with wake effect are not an environmental issue, but rather a techno-commercial issue and that Grassridge's concerns are of a profitability and commercial nature. Minister Creecy agreed with the arguments advanced by Grassridge and confirmed that wake effect impacts are, where relevant, required to be assessed. Consequently, Minister Creecy set aside the environmental authorisation and directed Bayview to obtain an independent wake assessment, conduct public participation in relation thereto and submit all information to the DEFF for its further consideration.

Most recently, in February, Aurora Wind Power (RF) (Pty) Ltd (Aurora) lodged an appeal against the DEFF's decision to grant an environmental authorisation to Vredenburg Wind Power (Pty) Ltd (Vredenburg) for the development of the proposed 140MW Boulders wind energy facility near Vredenburg. Aurora advanced similar arguments raised by Grassridge in its appeal. Aurora argued that the location of the proposed Boulders wind energy facility would have a wake effect impact on its existing West Coast 1 wind energy facility and that a wake effect impact assessment should have been undertaken. While Vredenburg did respond to the appeal, a decision by Minister Creecy on the appeal is pending.

With the DMRE committed to meeting the wind energy targets provided for in the IRP, the declaration by the DEFF of the REDZs in 2018, and the recent identification of possible additional REDZs, it is likely that appeals relating to wake effect and turbine turbulence impacts will become increasingly common. Considering that in the Grassridge appeal, the DEFF confirmed that wake effect assessments must, where applicable, be undertaken for proposed new wind energy facilities, it is recommended that the DEFF should go a step further to prevent frivolous and vexatious appeals against environmental authorisations by defining or adopting development setbacks for the wind energy sector. The purpose of such setbacks would be to prescribe an acceptable minimum distance needed to be maintained between existing wind energy facilities and proposed new facilities. It is further recommended that the DEFF must include such development setbacks in the National Web Based Environmental Screening Tool, which would allow applicants for environmental authorisations to identify any no-go areas for their proposed wind energy facilities in advance. Moreover, the EIA Guideline for Renewable Energy Projects published on 16 October

2015 should be amended to include wake effect and turbine turbulence on the Table of identified potential environmental impacts of wind energy projects. These recommendations would go a long way to prevent unnecessary, costly and time-consuming appeals and would provide greater assurance to potential developers and investors in the South African wind energy sector.

*Young is a Senior Associate and Kruger a Candidate Attorney at Warburton.*