

**KEY NOTE ADDRESS AND LAUNCH OF THE HIGH
RESOLUTION WIND RESOURCE MAP AT THE SEMINAR
OF THE WIND ATLAS OF SOUTH AFRICA PROJECT**

VENUE: EAST LONDON ICC

**DELIVERED BY MR OMPI APHANE ON BEHALF OF THE
DIRECTOR-GENERAL**

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Programme Director

Mr Walid Badawi, UNDP Resident Representative to South
Africa

Counsellor: Mr Jorgen Erik Larsen

Senior government representatives

Ladies and Gentlemen,

Please receive my greetings.

It is with great pleasure that I stand here before you today to
deliver a keynote address at the occasion of the final Wind
Atlas for South Africa (WASA) Seminar and the important

launch of the high resolution wind resource map for all of South Africa.

Ladies and gentlemen, in 2011 South Africa embarked on an ambitious renewable energy programme. This followed the promulgation of the Integrated Resource Plan (IRP) 2010-2030 that envisaged that 42% complement of all new build generation capacity will be procured from renewable energy sources. This progressive policy decision laid a firm foundation for the introduction of the much-lauded Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) in August 2011.

The REIPPPP initiative has resulted in the procurement of 6.3 GW of new renewable energy capacity to date, with 3.9 GW already online. The transparent and competitive bidding nature of the REIPPPP has been the main driving force behind the reduction in costs of these renewable energy projects. In particular, solar PV and wind have seen the most rapid decline in costs which are now competitive with conventional power generation sources. Solar PV costs have declined over 80% since 2011, while onshore wind has achieved around 60% cost reduction.

Successful bid tariffs achieved in the 2015 expedited Bidding Window 4 of the REIPPPP were below 5 USDc/kWh for electricity generation from both wind and solar PV.

Programme Director, cost trends for energy technology deployment can vary since the trajectory depends on various assumptions and on having a stable policy environment and consistent procurement programme over the long term. The latest iteration of the IRP, though still in draft, should serve as a practical demonstration of South Africa's continued commitment to investing in renewable energy. As you might be aware, the draft IRP proposes a significant share of the new generation to be from renewable energy. While the final IRP is awaited, I am confident that the outcome will provide further scope and impetus for further price reduction in renewable energy.

As we continue on our ambitious renewable energy path, wind energy remains an integral part of this goal. However, it would be difficult to plan thoroughly for the increased uptake of wind energy if one does not have certainty on wind resource availability. Therefore, the need for reliable, accurate and representative data on wind is critical. It is for

this reason that the Department of Energy undertook to complete WASA, the wind atlas of South Africa.

WASA constitutes one of the most critical elements of South Africa's renewable energy efforts due to its contribution to the repository of knowledge about the scale and location of our wind resources. Thanks to the WASA project, South Africa has developed an excellent wind resource assessment capability at key public institutions, namely CSIR, South African Weather Services and the University of Cape Town, which allows for the planning of large-scale exploitation of wind power nationally. Second, we have also developed critical project management and knowledge management expertise particularly at the South African National Energy Development Institute and the CSIR which hosts the WASA project database and website.

As South Africa, we owe a great deal of gratitude to the Danish Government, Global Environment Facility (GEF) as well as the United Nations Development Programme (UNDP) Country Office for their support of the WASA project. Through our collaboration, we have been able to develop a high resolution wind atlas based on international standards, largely due to securing sufficient funds from the Global

Environmental Facility and the Danish Government as well as the technical support received from the Danish Technical University (DTU) during implementation of the project.

Ladies and Gentlemen, this year's event also coincides with the 10th anniversary of WASA project. As such, I am delighted that you could all join us here today as we celebrate this milestone, and I wish to thank the WASA project team for organising this seminar to enable us to reflect on the journey we have travelled since this project started 10 years ago. So much has been achieved over this period - what a journey it has been!

Programme Director, as you are aware, WASA was conceived back in 2008/09 with the launch of the first phase of South Africa Wind Energy Programme (SAWEP I). We launched the first verified numerical Wind Atlas of South Africa in Cape Town on 13 March 2012, and from the onset, the results were well received by industry and the public at large. We are now into the third iteration of WASA. WASA 1 and 2 received significant funding from the GEF through UNDP during SAWEP 1 and the Danish Government in line with the Danish Support to Renewable Energy Development Programme in South Africa.

WASA 1, which has nine (9) wind measurement stations commenced in June 2009 and completed in April 2014 with a focus on Western Cape and parts of Eastern Cape and Northern Cape Provinces. The WASA 2 study area which has five (5) measurement stations started in March 2013, focused on the remaining parts of the Eastern Cape and was extended to include KwaZulu-Natal and the Free State Provinces. WASA 2 was completed in 2018.

South Africa received further funding from GEF for the second phase of SAWEP. Amongst others, SAWEP 2 is supporting the extension of wind resource assessment to cover the remaining areas of the Northern Cape Province which is to be completed in 2020. As a consequence, at least four (4) additional measurement stations were erected at the beginning of September in the Northern Cape under WASA 3.

The measurement results of WASA 1-3, which cover an estimated 75% of South Africa's land cover will be used to extrapolate the prevailing wind conditions for the rest of South Africa. Effectively, WASA 1, 2, and 3 constitute the building blocks of the South African wind atlas. Due to

budgetary constraints the project had to be developed in phases.

WASA is implemented as a capacity building and research cooperation project between the Danish Technical University (DTU) and South African institutions. The DTU, with over half a century experience in meteorological sensors and measurements, has developed a reputation as the world leader in wind resource mapping. The *Frogfoot* model which was used for wind modelling in WASA 1 and 2, and which will also be applied in WASA 3, was developed at DTU.

The South African team for WASA is made up of the Centre for Scientific and Industrial Research (CSIR), University of Cape Town (UCT), South African Weather Service (SAWS), Danish Technical University (DTU) and South Africa National Energy Development Institute (SANEDI). These are independent public interest organisations with no vested commercial interest in the local wind energy sector. The research conducted and products delivered, are therefore not subject to any commercial interests or pressures. For this reason, all outputs of this work including the high resolution wind atlas are made freely available to everyone.

These institutions were deliberately chosen from the onset to build capacity in South Africa's public institutions for the benefit of the State and the general public. Significant skills transfer has taken place in WASA 1 and 2. The DTU continues to be involved in WASA 3 *albeit* to a lesser extent than in WASA 1 and WASA 2. As a result of direct collaboration DTU, CSIR, SAWS and UCT are developing synergistic momentum towards institutionalising the measured and generated wind data by developing country capabilities in what is termed "Energy Meteorology" studies and short term wind energy forecasting.

Programme Director, just to underscore this point, CSIR is putting insight and expertise it has gained through its involvement in WASA to use in the Upper Blinkwater (UB) mini-grid project, here in the Eastern Cape. As part of SAWEP 2, the Department is collaborating with the Provincial Government of Eastern Cape on the UB mini-grid project. This project is one of the flagship projects under the partnership between the Eastern Cape and Lower Saxony State of Germany. The mini-grid pilot project has been initiated to electrify the small village of Upper Blinkwater in the Raymond Mhlaba Local Municipality.

The UB mini-grid power system includes a 75 kWp photovoltaic (PV) system, 370 kWh battery storage, and a 20 kW backup diesel generator (400 l diesel storage). Currently, the UB mini-grid project does not include any wind power. The addition of small-scale wind turbines will complement this project with small-scale wind turbines that operate at lower heights than large turbines and where wind speed is not optimal, since the area is mountainous. Due to this topography as well as necessary information for proper siting of the turbine, a proper wind resource assessment will be required.

The CSIR has the requisite expertise to do wind measurements and analysis under these circumstances, and already has the required wind measurement equipment, the LIDAR. LIDAR is mobile and therefore can shorten the physical wind measurements by up to 50% compared to the traditional 12 months which is standard when the fixed conventional wind measurement masts are used. In other words, by virtue of its accumulated technical expertise acquired through its involvement in WASA, the CSIR is now well placed to assist with the UB wind resource assessment, integration and balancing study. If successful, this pilot project can provide a template for implementation of hybrid

mini-grid systems in South Africa. It can also serve as a solution to the challenges of electrifying rural and isolated communities, where deployment of grid infrastructure is difficult and costly.

All of these initiatives and future focus areas will provide a conducive incubation environment for the creation of advanced or post graduate studies which South Africa could draw from in advancing its renewable energy capabilities. The intellectual property and knowledge base generated through WASA should thus be viewed as a national asset.

This seminar will therefore also celebrate the ground-breaking achievements of the project over the years. Today you will hear from the list of experts from DTU, CSIR, UCT and SAWS, who will provide an updated overview of the wind climate based on reliable wind data using contemporary models. The event will culminate in the launch of the Wind Atlas and database with Large-Scale High-Resolution Wind Resource Map covering all nine provinces of South Africa.

I wish you all fruitful discussions and and networking.

Once more, thank you to all partners involved in making today's event possible.

I thank you.