

# HOLISTIC WASTE MANAGEMENT SOLU

**All types of waste material could provide a business opportunity, but success is dependent upon sound planning and the correct approach, as all waste management projects are unique.**

► The growing move in South Africa towards the beneficial use of solid waste, as a means of diverting waste from landfills, relies extensively upon specialist companies that have the skills and capabilities to provide an integrated solution.

Project developers are looking for a single supplier of a multitude of engineering skills. These are supported by experienced and knowledgeable in-house environmental scientists who work within the framework of onerous environmental legal requirements, to ensure the smooth implementation of projects.

## Complex waste management

Richard Emery, an executive associate and specialist in integrated waste management at JG Afrika, says the company's involvement in a host of complex integrated waste management projects has established it as a leader in this field in South Africa and neighbouring countries.

This includes in Namibia where JG Afrika is providing expertise to help develop a large biomass waste-to-power project, following its participation in the largest such initiative in Africa that started operating in Athlone, Western Cape, earlier this year.

In addition, Emery and his team are working closely with Zimbabwean municipalities to develop a bespoke landfill diversion strategy for the country that takes into consideration existing limitations that inhibit the successful implementation of important projects.

"We have developed extensive capabilities over the years that have become extremely sought-after as projects continue to evolve to the point where even traditional landfill engineering skills now also need to be complemented by an integrated engineering unit," he says.

This acknowledged expert and his team also worked alongside RWA, a UK-based specialist waste consultancy, to complete a pilot project that will help six selected South African municipalities adopt strategies geared at diverting organic waste from their landfill sites and make a noticeable impact on emission reduction.

JG Afrika and RWA were acting on behalf of the South African National Department of Environmental Affairs (DEA), the coordinating body implementing the programme at a national level, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

## Capability and depth

Not only does it serve as a sound example of the extent of the capability and depth of understanding the firm brings to project developers and the professional teams working on related projects, but also its approach that starts at the waste source.

As Emery points out, "projects are best developed when they are based on a thorough understanding of the characteristics and consistencies of the waste streams involved, before moving on to "best-fit" solutions. This, alone, highlights the need for expert opinion and solutions from an objective engineering and environmental consultancy," he says.

It was only once JG Afrika and RWA had a thorough understanding of the characteristics of the various waste streams and their consistencies could they then commence with the second phase of the DEA project. This involved the selection of the best suited scenarios and the drafting of practical and feasible business and implementation plans for the various municipalities.

During the actual implementation cycles, JG Afrika's extensive engineering and design capabilities meet the onerous requirements of the developers and teams involved in these modern projects.

In South Africa, most of these projects are being undertaken by the private sector under public-private partnerships, such as the build, own, operate and transfer (Boot) model.

Alternatively, turnkey varieties, including engineer, procure, construct and manage (EPCM), or engineer, procure and construct (EPC) have been adopted due to the intricacies of the projects.

JG Afrika's offering to these professional teams span civil and

→ Added to this, the tariff Diaz will be charging will deliver energy at lower rates than any of the existing generation plants in the country – aside from Ruacana – or power imports; which in turn will deliver excellent value for money for Namibian consumers.

Although there has been a marked increase in interest in wind generation across Africa, in truth, Africa hosts a few areas that lend themselves to this form of power generation.

Dinesh Buldoo, director, transmission and distribution, WSP, Africa, says: "NamPower, the national power utility company in Namibia, started exploring wind power capability in 1998. At the time the Ministry of Mines and Energy installed wind measurements stationed at Walvis Bay and Lüderitz – and in the same year, a feasibility study was launched to assess the viability of developing wind farms in these towns. While the Diaz Wind Farm will be the first in the country, Namibia offers some of the highest

wind potential in Africa, considering it is located in the more extreme latitudes away from the negative impacts of atmospheric heating and the earth's rotation."

Both Lüderitz and Walvis Bay, an important deep water harbour town north of Lüderitz, experience wind speeds of about 7 m/s. Measurements at 85,7 m high, undertaken in Lüderitz, have predicted a yearly wind speed average reaching 10 m/s, with a stable wind direction. Other areas around Namibia's coastline that also offer good wind potential include, Henties Bay, Terrace Bay and Mowe Bay.

"Namibia intends on growing this form of renewable energy generation capacity within the country. It is estimated that the country's potential is 27 201 MW and 36TW/h a year with a relative land use of 824 268 km<sup>2</sup>. Diaz Wind Farm is certainly a bold step towards embracing wind generation technology.

And, while the Namibia's renewable energy policy is in its final stages, we

expect to see a growing number of wind farm projects increasing in size at a utility level coming to ground – especially as the country pursues its ambitions of a 70% renewable energy scenario by 2030," concludes Buldoo. ◀



*Dinesh Buldoo, director, transmission and distribution, WSP, Africa.*



*The JG Afrika team undertake waste characterisation and opportunity assessments at the City of Mbombela. Richard Emery is second from the left.*

structural engineering and design through to the important transport and traffic expertise that is essential to ensuring cost-effective, optimal and safe transport of waste streams to where they will be benefited.

In-house experienced geotechnical engineers, geohydrologists and wastewater-treatment engineers provide essential services required to also help develop these projects, especially those based upon the increasingly popular anaerobic digester technology that produces a biogas for the generation of electricity.

These skills are essential in water-stressed regions of the country, such as the Western Cape, Limpopo and Mpumalanga. This is considering that projects have to be planned close to a consistent supply of water that is used to generate electricity.

Emery says that, in some instances, projects will even require their own wastewater treatment facilities that allow water to be reused by the facility.

These large biomass projects are also taking longer to implement in most cases. This is considering the complexities surrounding power-purchase agreements in the country and slower roll-out of the next round of projects under the Renewable Energy Independent Power Producer Procurement (REIPPP) programme.

## Off the grid

However, Emery notes that there is a growing interest in smaller related initiatives by property developers as it allows them to reduce their own draw on energy from the national grid, while 'greening' their assets in line with the 'green' building movement.

JG Afrika was involved in such a project at the Bayside Mall in Cape Town, Western Cape, where, together with a rooftop solar project and waste generated from the facility it is used for digestion-to-electricity. The project has helped the owner reduce reliance on conventional grid electricity and lower its overall carbon footprint and operating costs.

He says these smaller biomass projects are easier to implement as they are not always exposed to the same political challenges as their utility-scale counterparts.

"In such projects, electricity generated by the facility is for its own use and not evacuated into the national grid. We do foresee more of these projects from property developers and owners, considering the increasing emphasis on sustainability," says Emery.

"However, the planning and skilled opportunity assessment needs to be done. This can be reasonably quick to ensure return on investment; that is where JG Afrika can step in."

Other technologies that are also growing in prominence include composting – both open windrow and in-vessel varieties – as well as the recycling of white paper, metals, including aluminium, and glass.

Set to complement the company's impressive portfolio of waste management initiatives is its imminent involvement in two biomass projects under the REIPPP programme that involve woody residues generated from the forestry and sawmilling industries.

Emery concludes that these bode well for the future of biomass projects and integrated waste management strategies in the country, and notes that JG Afrika has proved that there is a ready source of technical capability on hand to facilitate their implementation. ●