

RENEWABLE ENERGY

# Current renewables targets as much a hindrance as a help

In his State of the Nation address, President **Jacob Zuma** committed his government to addressing the triple challenges of unemployment, poverty and inequality. Nowhere will these be more objectively measured than at the upcoming RIO+20, which will take place in Rio de Janeiro, Brazil, and where a rigorous process will require politicians to review progress in addressing the growing and interrelated problems of a planet under threat from pollution, water shortages, depleting resources and overcrowded cities. Yet Zuma did not offer practical solutions to address his challenges in relation to these issues.

The combined efforts of the departments of Environment Affairs and Energy also do not provide the enabling legislative environment that allows us to solve our problems.

A major shift to renewable energy is cited as a national priority. But facts do not support the thesis.

The 3 725 MW target for renewable energy set in 2003 will, hopefully, be reached once a first bid in November 2011, allocating 634 MW to wind, 632 MW to solar photovoltaic (PV) and 150 MW to concentrating solar power (CSP), is followed by further bidding processes this year.

In only seven months, a ten-year target will be reached if all projects come on stream within the next two years. A further 18 000 MW over 20 years is the current target, comprising mainly wind and solar PV (8.4 GW each), 1 GW of CSP and 0.4 GW of hydro, biomass, landfill gas and biogas.

This target may serve as a guide, but is, in fact, a hindrance to the local growth of renewables.

This arbitrary and centralised model may have been the only way to achieve rapid implementation, but a more decentralised approach would lead to a more accurate reflection of the country's ability to make best use of its excellent

solar radiation. The low target for CSP, which could replace entire coal-fired power stations or nuclear plants, is a glaring deficit.

CSP has scope to develop a local industry, unlike imports from China for wind and PV.

The absence of waste-to-electricity in the Integrated Resource Plan also demonstrates a failure to respond to the country's potential and needs.

Better use of waste to generate energy would assist in reducing the burden of ever-increasing loads of garbage on land and water, and would offer a steady backup source of power for hybrid systems that include solar PV and CSP, wind, hydro and biomass.

Most municipalities are running out of dumping ground. Some burn the waste, releasing a toxic mix of 'noxes', 'soxes' and 'coxes' into the atmosphere, along with methane, mercury and chlorine vapour. In dumps in the Eastern Cape, the toxic cocktail flows unhindered into adjacent estuaries, rivers and sea.

Tyres contain many harmful chemicals and heavy metals which contaminate the food chain and contribute to diabetes, cancer, foetal abnormalities and a range of other illnesses.

The government programme for tyre collection faces limited capacity to safely dispose of them.

Stringent new standards have resulted in waste incineration technologies of old to be superseded by cleaner technologies. Many require complex engineering at great expense.

A relatively new technology, known as thermal recycling, has attracted attention for its simplicity, low cost and potential to handle several looming crises.

It is used by the US military and can handle conventional waste, hazardous medical waste and tyres. No methane is emitted and the carbon dioxide (CO<sub>2</sub>) emission is 50% less than from a conventional coal-fired plant. The final ash that emerges



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is inert and can be used to build roads, bricks and other construction materials.

The essence of thermal decomposition is the application of heat at 500 °C in a primary oxygen-starved chamber, followed by burn-

ing of toxic gases in a secondary chamber at 1 200 °C. Whereas the outdated mass-burn incineration released 1 600 kg of CO<sub>2</sub>/MW and coal-fired-power stations release 1 000 kg of CO<sub>2</sub>/MW, thermal recycling releases 480 kg/MW.

This can be further reduced by up to 80% by using a process that mimics the earth's filtration of rainwater through sand and rocks, also useful to treat acid mine drainage. The end products are alkaline bicarbonate and potable water. A waste stream of 1 400 t of waste a day produces 50 MW of electricity using 80% less water than coal-fired plants.

A major obstacle to the implementation of waste-to-energy programmes and other initiatives requiring partnership with the private sector is poor coordination between the departments of Finance, Energy, Environmental Affairs and Trade and Industry as well as Eskom and the National Energy Regulator of South Africa, and between national, provincial and local governments. The legislative zone is a maze to navigate.

The National Treasury regularly reclaims billions from municipalities. This money could be spent on an 'Energy Codesa' that unites all the entities vying for a share in energy earnings. (Codesa stands for Convention for a Democratic South Africa, where South Africa's new political dispensation was negotiated in the early 1990s.) It could support a municipal renewable-energy feed-in tariff at which renewable energy below 50 MW is bought and fed into the grid.

With rationalised, coherent policies, innovative South Africans will build a vibrant energy sector, smartly offering hybrid solutions and unlocking the potential for job creation and energy production that our weather affords. Our scores on all indices will improve and we will attract foreign investment and help Zuma deal with his triple challenges.

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