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### **The case for the use of biomass renewable energy**

The provision of renewable energy (RE) has been recognised in South Africa as a very feasible solution to help overcome the country's current dire energy crisis. South Africa's Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) which commenced in 2010 when the Department of Energy (DoE) issued its first Request for Proposal (RFP) for new generation capacity, has made great strides and been lauded a success by RE industry players the world over. The DoE is now seeking the consensus of the National Energy Regulator of South Africa (Nersa) for the procurement of an additional 6 300 MW of renewable energy.

Biomass, a lesser known but very viable form of renewable energy, entered the REIPPPP in Window 3 with the first biomass project being awarded and an investment of ZAR1061 million (US\$108 million) allocated to it. Last month in Window 4, the Ngodwana Biomass Energy Project was selected as a successful renewable energy bidder. Financial close for this project will take place later this year. However Rodrigue Kamba, Project Engineer for EES Africa (Pty) Ltd, advocates an increased allocation and investment in biomass in South Africa going forward, and in this article discusses how it is used to generate energy.

EES Africa is an ISO 9001:2008 certified company providing management, engineering and auditing services to a range of industries throughout Africa. It has been instrumental in the implementation of REIPPPP projects in South Africa to date.

Biomass energy is renewable energy that comes from organic material. It includes energy from both plant and animal matter. It is derived from the reaction between carbon dioxide, water and sunlight, via photosynthesis.

One of the key advantages of biomass is its versatility. Not only can it be burned directly to produce heat and energy, but it can also be converted into a gas or oil to generate electricity (bio-power) and heat, or converted into liquid fuels (bio-fuels) for transportation needs.

"Biomass can be converted into electric power through several methods. The most common is direct combustion of biomass material, such as agricultural waste or woody materials," says Kamba.

Other options include co-firing, gasification, pyrolysis and anaerobic digestion. Kamba explains:

“Co-firing involves burning biomass, along with coal, in traditional plant boilers. Gasification produces a synthesis gas with usable energy content by heating the biomass with less oxygen than needed for complete combustion. Pyrolysis yields bio-oil by rapidly heating the biomass in the absence of oxygen. Anaerobic digestion produces a renewable natural gas when organic matter is decomposed by bacteria in the absence of oxygen.”

Kamba cites electricity from sugarcane as a typical example of biomass energy. “Sugarcane bagasse is the pulp or residue left after sugarcane is crushed, with the juice being used to make sugar. The bagasse is then burnt to generate electricity.”

Kamba concludes: “Biomass has a significant role to play in renewable energy generation, overcoming global warming and ensuring a sustainable future. If biomass energy is generated and produced correctly in ways that enhance and protect the environment it can be sustainable for generations to come.”

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#### **EES company profile:**

Established in 2001, EES Africa (Pty) Ltd specialises in the integration of multiple system infrastructure including ICT, Data Centres, Audio Visual, Life Safety, Security and Building Automation Systems. As an ISO 9001:2008 certified company, our vision is to be Africa's management, engineering and auditing professional service provider of choice. The EES Value Proposition focuses on translating technology into tangible deliverables for clients through the experience of a talented team of Engineering and ICT Consultants and Project Managers. With offices in Cape Town, Stellenbosch, Johannesburg and Durban, EES operates predominantly in the Renewable Energy, Oil & Gas, Financial Services, Infrastructure, Utilities, Telecoms and Mining sectors.

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