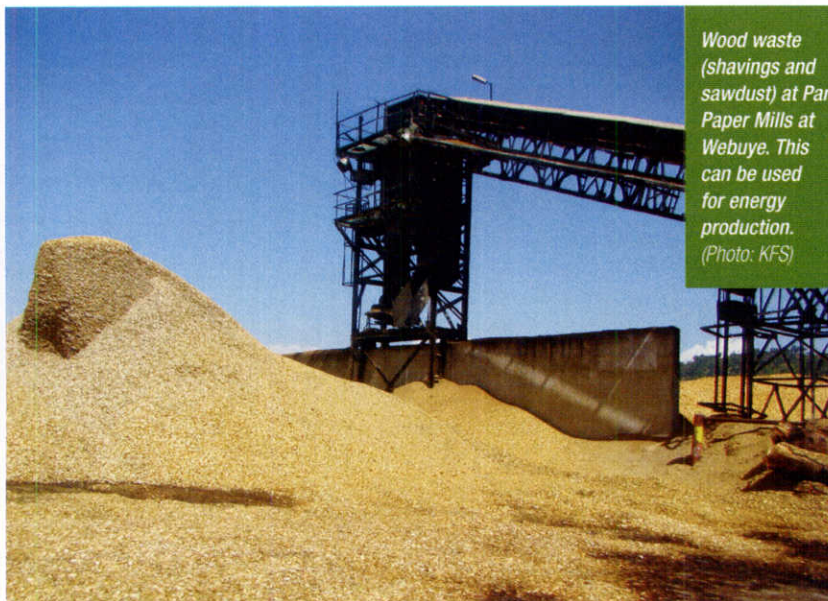


# Turning waste into electricity

Agricultural and forestry residues as well as municipal solid wastes can be exploited for economic gain

By James Onchieku, Faith Odongo and Charles Ondieki



Wood waste (shavings and sawdust) at Pan Paper Mills at Webuye. This can be used for energy production. (Photo: KFS)

**B**iomass gasification technology is not widely promoted in Kenya. Although the country produces large quantities of agricultural residues such as coffee husks, rice hulls, sawdust, maize cobs, et cetera, as well as forestry residues and municipal solid wastes annually, most of these are currently not exploited for economic gain. Energy crops like bamboo and invasive species such as *Prosopis juliflora* could be grown purposely for electricity generation.

Use of biomass residues for energy generation, however, is limited by the fact that no comprehensive assessment of available residues and their potential for electricity generation has been done to date.

The first National Workshop on Biomass Gasification Technology in Kenya was held in Nairobi in May this year under the auspices of a project entitled, "An Integrated Biomass Gasification Technology for Production of Electric Power and Charcoal for Rural Households in Kenya". This is a collaborative project between the Kenya Forestry Research Institute (KEFRI) and the Energy and Environment Partnership Programme for Southern and East Africa (EEP-S&EA) which is funded by the Ministry for Foreign Affairs of the Finnish Government and the Austrian Development Agency. The Ministry of Energy, Energen Africa Ltd and Multi Media University College of Kenya are implementing partners.

The project seeks to increase access to modern, clean, affordable and reliable energy services through increased usage of biomass gasification technologies.

The main objective of the workshop, which attracted well over 40 participants from different sectors along the value chain of biomass gasification technology, was to build technical and infrastructural capacity of stakeholders.

When opening the workshop, Patrick Nyoike, the Permanent Secretary, Ministry of Energy urged stakeholders to take advantage of the current favourable policy and regulatory framework regarding biomass energy to initiate business ventures which would contribute to minimising energy poverty in the country, reduce economic poverty and improve the livelihoods of communities. The need to increase access to modern, clean, affordable and reliable energy services through an increased usage of biomass gasification technologies cannot be overemphasised.

Biomass gasification, which is basically a thermo-chemical process, converts biomass materials into a gaseous component, *producer gas* or *synthesis gas*. Once processed as required, the biomass resources are suitable sources of feedstock for gasification.



Woody biomass can be used for traditional applications like electricity poles and paper; but also novel applications like chipping for feedstock and electricity production.

When directed to a generator set or turbine, the *producer gas* can generate electricity for lighting, heating water and warming households in rural communities located far from the national power grid.

Dr Ben Chikamai, the Director KEFRI, hailed and underscored the need for consultative and collaborative Research for Development and Deployment to have grassroots impact and contribute to the achievement of Millennium Development Goals (MDGs). He observed that the current scenario where over 85 per cent of the population use traditional biomass for their energy needs and services was unacceptable if Kenya is to achieve the MDGs. The trend is moreover associated with serious indoor pollution, deforestation and enormous wastage of time, which could be put into productive economic activities.

The National Project Coordinator, Dr James Onchieku sees the workshop as a culmination of greater things to come. "Potential investors will in future have a one-stop shop where they can access a comprehensive database on all current and potential feedstock for biomass gasification," he said. A pilot demonstration, notably a modified Downdraft Imbert Gasifier, able to generate about 100 kWe, will be designed and installed within the KEFRI campus as early as 2012 where potential investors will have access to technical information necessary for up-scaling the technology.

Investors, experts from institutions of higher learning, researchers as well as local and international organisations in attendance recommended having regular forums of this kind to stimulate investment in renewable energy technologies, especially biomass energy.

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