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"Global food security and food safety:
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Renewable Energy Recovery Generation for Security and Safety in Global Agriculture and Production: Justification and Outlook

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Abstract

Waste is problematic in agriculture, production and remote-locations. Remote-power-generation cost is high due to diesel-fuelled gensets. With high premium on food-energy security and safety, the 330 kWe ERK®-ReGen container-power-plant improves waste management and lowers electricity-prices at these locations. Standardized components installed in multiple-containers enables high-quality, simple-transport and rapid-installation. The objective of this study is to present this renewable-energy-recovery-generation (ReGen)-design concept from evaluated resource-energy-use of some remote-areas of the world. A novel technique that combines resources and energy surveys with socio-economic-analyses was adopted in the technology properties and waste to identify and justify factors for the promotion and development of such techniques. Biomass and waste-materials were identified as inevitable products of society and are available in many remote-locations worldwide. Since substantial amounts of agriculture and production take place in remote-areas, a major challenge of the future is to understand how to manage large quantities of waste sustainably. Therefore, waste sources, their compositions and available waste-to-energy-technology options were researched. An approach has been to minimise the amount of waste produced and to recycle larger fractions of biomass and waste-materials. Renewable-energy-recovery-generation (ReGen) from waste can solve two problems at once; first is treating non-recyclable and non-reusable amounts of waste; and second is generating a significant (decentralised) amount of energy which can be included in the energy-production-mix in order to satisfy customers'-needs while keeping costs low. Interaction between waste-management-solutions and energy-production-technologies can vary significantly, depending on multiple-factors. ReGen is independent of fluctuating fossil fuel prices meaning energy-independence with reliable base load supply with the possibility of hybridisation for peak-demand to simultaneously solve the problems of waste, pollution and electricity generation. The diesel fuel substitution reduces CO_2-emissions and sustainable-thermal-waste-disposal avoids ground soil-water contamination and marine pollution. The user-friendly, iconic ReGen-Plug&Play-system minimises installation time and enables relocation to new-sites. Emphasis should be placed on resource and energy-management-techniques that conserve the environment, foster food-energy security and safety. Therefore, policies that protect our oceans and land through sustainable resource and energy use must be emphasised. Sustainable foodenergy-production is a daunting challenge to global agriculture, industry and society and needs to be addressed in Africa and other remote-locations.

Keywords: Energy efficiency, ReGen - remote generation, safe production, waste to energy

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