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ABOUT SCODE

- Scode is a grassroots community development organization whose mission is to facilitate adoption of clean energy solutions and sustainable land use approaches through capacity building, advocacy and action research for enhanced livelihoods of men and women.
- The organization has two key programmes:
- Renewable energy technologies programme focuses on sustainable utilization of renewable energy resources to reduce pollution, enhance food security and improve family income.
- Sustainable Land Use Management aims at improving food security and income levels of small-scale farmers through the adoption of low external input environment friendly technologies and approaches.



SCODE'S BIOGAS WORK

- Started biogas awareness creation and demonstration work in 1998
- Has facilitated installation of domestic size biogas plants for households (4-16M³) and several bigger size biogas plants for institutions (25 – 50M³)
- Has been an implementing partner (IP) in the Kenya National Domestic Biogas Program (KENDBIP) overseen by the Ministry of Energy and Petroleum
- Promotes biogas through awareness creation, capacity building, action research and gender mainstreaming

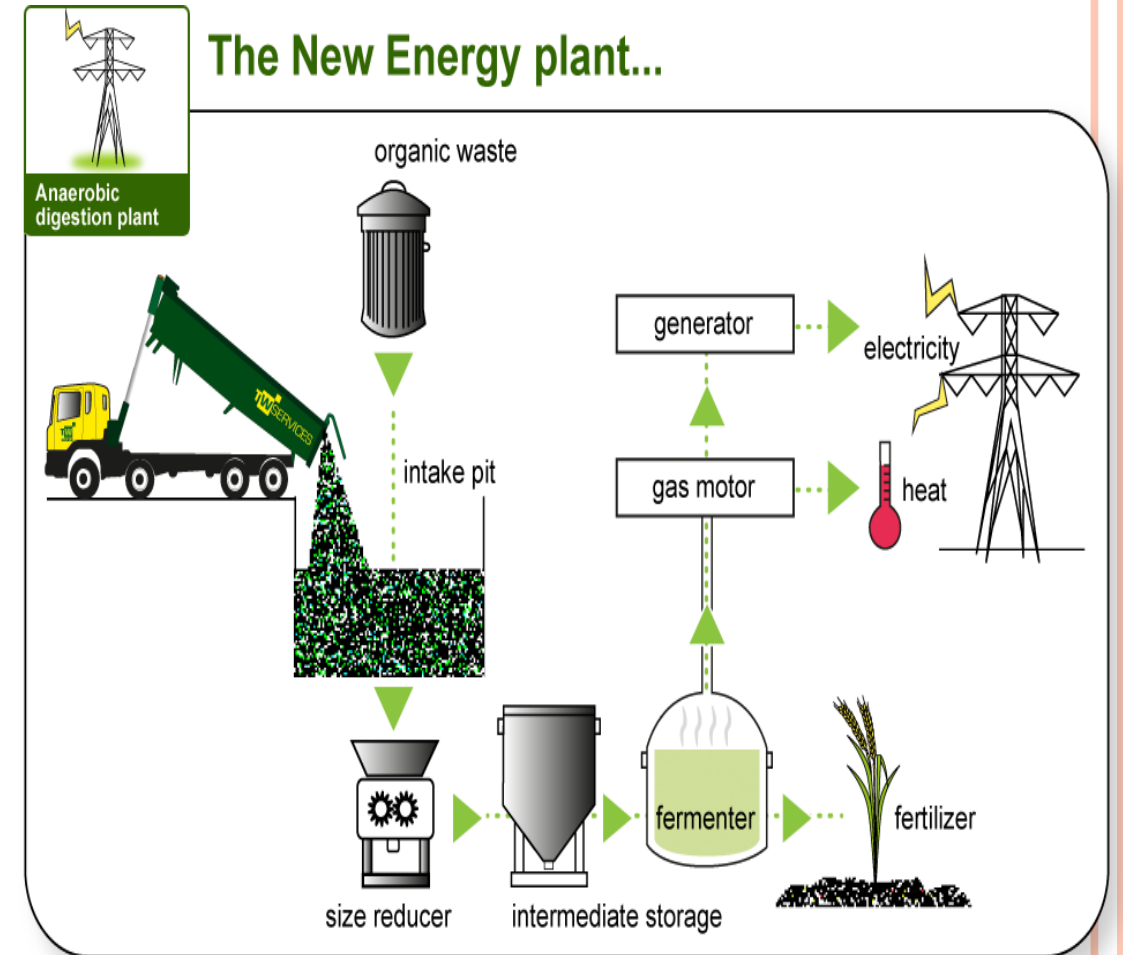


INTRODUCTION

This is a waste-to-resource project that seeks to generate electricity, organic fertilizer and water from treatment of sewerage and solid organic waste in Nakuru County, Kenya.

The objectives of the project are:

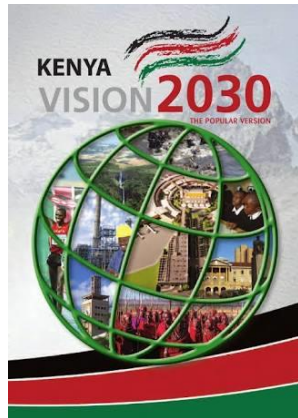
- To generate electricity for grid support (4MWp);
- To convert sewerage waste water into water for domestic and/or agricultural use (9000 M3/day);
- To use bio-slurry to produce organic fertilizer for agricultural use (1500tons/annum).



JUSTIFICATION FOR THIS INITIATIVE

Project will contribute to urban sustainability in accordance with:

- Kenya's Vision 2030;
- UN's SDGs 2, 6, 7,11,12,13,15,17;
- 3 objectives of SE4ALL;
- The GoK Big 4 Agenda;
- Nakuru CIDP 2018-2022



Objectives by 2030:

-  Ensuring **universal access** to modern energy services
-  Doubling the global rate of improvement in **energy efficiency**
-  Doubling the share of **renewable energy** in the global energy mix



WHO INITIATED THIS PROJECT & WHY

- The project was initiated by Scode Limited, a Kenyan private company specialising in providing clean energy and sustainable land use solutions to customers in Kenya.
- Scode has worked with SNV and NAWASCO since 2014 in developing carbonized briquettes from sewerage waste (human faeces)
- This initiative is driven by the fact that Nakuru Town's sewerage and MSW infrastructure is overloaded and underdeveloped.
- The project partners plan to adopt gasification of MSW and anaerobic digestion of sewerage waste as economical, sustainable and environment-friendly approaches to dealing with MSW and sewerage waste.



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PARTIES RESPONSIBLE FOR PROJECT DEVELOPMENT

Project will be implemented by a consortium of partners forming a special purpose vehicle (SPV):

- County Government of Nakuru will be responsible for stakeholder engagement, provision of land for the project and permits for the project to use MSW & sewerage waste.
- Investors responsible for funding the project;
- Scode Limited & co-developers are responsible for Project Development & Management
- Project developers wish to adopt a Design, Build, Operate & Transfer (DBO&T) contract as it will enhance local expertise and technical capacity of the team involved.

STAKEHOLDERS AND BENEFICIARIES

- County Government of Nakuru
- NAWASCO - will be raw material suppliers to the project and an off-taker of the recycled water;
- MoE&P - will issue approval for the project to sell electricity to the national grid under the feed-in-tariff policy
- KPLC –will be off-takers for the power component
- ERC- will issue license to generate electricity
- MENR - will issue environmental safety certificate for the project;
- Private Waste Collectors – will be raw material suppliers to the project;
- Farmers – will provide a market for the organic fertilizer produced by the plant;
- Residents of Nakuru county –will benefit from the reduced health and safety dangers posed by existence of overloaded dumpsite and open sewerage treatment ponds; will be educated on benefit of practicing waste separation; and
- Financiers/investors – will provide capital in exchange for share of cash-flows accruing from the project.

PROPOSED TECHNOLOGIES

- Direct Combustion: 120 tons of Municipal Solid Waste (MSW) will be combusted daily. Ash generated will be used to make bricks
- Anaerobic bio-digestion: Sewerage organic waste will produce methane gas to be fed into gas generators to generate electricity
- Bio-Slurry coming from the bio-digesters will be processed into organic fertilizer.
- Heat generated will be used for sanitizing the bio-slurry and for treating waste water from the bio-digester
- Waste water in the slurry will be treated for use as liquid fertilizer or for domestic use



ENVISIONED BUSINESS MODEL

Revenue sources:

- Electricity sales to the off-taker KPLC under the Feed-in-Tariff regime at USD 0.10 per KWh with an annual escalation of 8% on the variable component of the tariff over a 20-year period
- Recycled water bulk sales to NAWASCO for onward distribution to households.
- Organic fertilizer bulk sales bulk purchasers for reselling to the farmers in the region.
- Total Revenue from the project is estimated at USD 2.655 Million per annum.

CAPEX:

- 4 MW power facility is estimated to be USD 10.6 Million.
- 1500 ton organic fertilizer facility is estimated to be USD 2.5 Million
- 9,000 M3/day waste water cleaning facility is estimated at USD 2.5 Million.

OPEX:

Annual operating costs (OPEX) for the project is estimated to be USD 1.4 Million.



KEY ASSUMPTIONS FOR THE FINANCIAL MODEL

- 15-year project cycle
- 65:35 debt-to-equity ratio
- 10-year loan with an interest rate of 8%
- Equity IRR of 14%
- Cost and revenue inflation is assumed to be equal

LESSONS LEARNED ELSEWHERE IN A SIMILAR INITIATIVE

- Political good will, support from line ministries and grant funding are extremely important in getting such projects off the ground.
- There is lack of expertise and experience in Kenya for developing and implementing such waste-to-resource projects.



CURRENT STAGE OF THE INITIATIVE

The project is in development stage. The following has been achieved so far:

- Pre-feasibility study done
- Approval letter from the MoE&P for the project under the Feed-in-Tariff obtained
- Co-developers willing to finance the project development to financial close at risk obtained
- Letter permitting the of use sewerage and MSW from the County Government of Nakuru obtained
- MoU for intention by Nakuru county to lease land to the project obtained

NEXT STEPS: AUGUST 2018 – JUNE 2021

Conduct comprehensive technical and financial feasibility studies to consolidate the business case and enable the project developers to secure the remaining permits which include

- Electricity generation license
- Power Purchase Agreement
- Bulk water selling license
- License to produce and sell organic fertilizer in bulk



INTERVENTIONS TO BRING INITIATIVE TO FINANCIAL CLOSE

There is urgent need to

- commission the detailed technical and financial feasibility study;
- carry out the design work;
- formulate suitable financial, technical & legal structure;
- identify suitable financiers of the project's implementation (EPC and O&M);
- finalize key counterparty agreements;
- negotiate funding terms and execute financing agreements.

