

# KUDURA | Rural Village Energy Hub

ENDING RURAL POVERTY THROUGH SUSTAINABLE, RENEWABLE, RELIABLE WATER AND ENERGY



RVE.SOL

## POTABLE DRINKING WATER

On demand water purification system based on market leading ultrafilter technology. Average water filtration rate of up to 1,200l/h; internal 1000l tank for pre-treatment of raw water.



## SOLAR ELECTRICITY

230VAC electricity for up to 20 homes on a rural mini-grid; limited electronically to 55W per home, providing enough power for two CFL lamps, charging mobile phones and powering a radio or small television.



## BIOGAS

Two stage, batch-fed, anaerobic digester employing thermophilic process. Capacity for 10 homes at 3 hours cooking time per family per day.



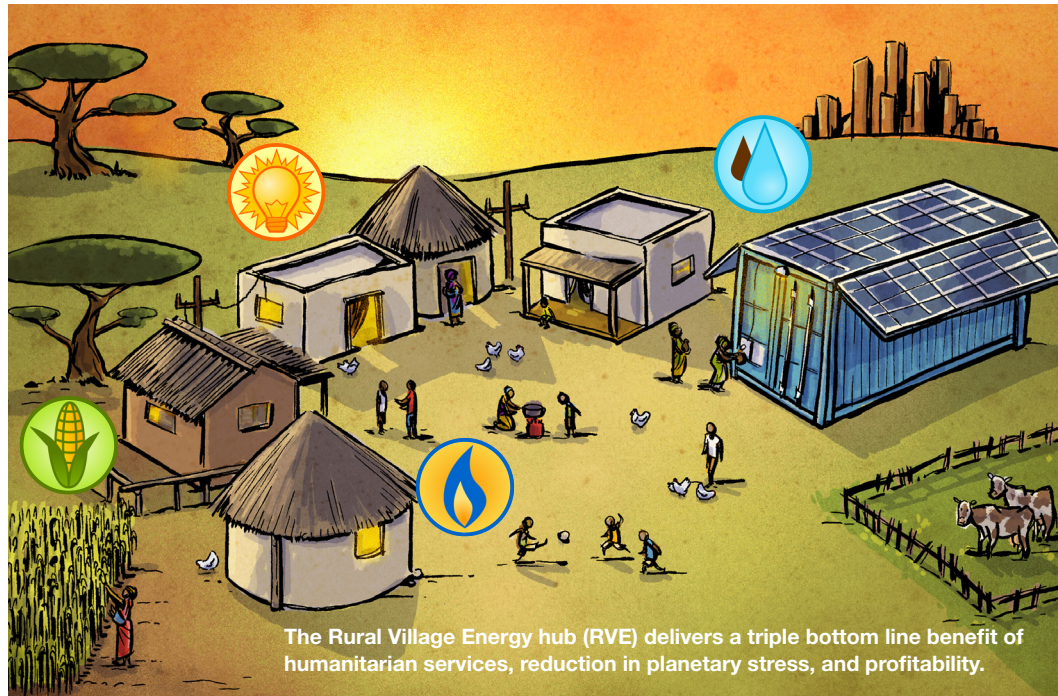
## ORGANIC FERTILISER

Effluent as organic fertiliser for the rejuvenation of over-tilled agricultural soils. Enabling over the medium term increased crop output, quality, and quantity.



## Product Brief

The Kudura rural village energy hub is a custom designed, for-purpose solution that addresses some of the key causes of rural poverty. Incorporating quality technology components from the world's leading manufacturers, it is designed and built for maximum quality and reliability, setting the standard for decentralised, off-grid rural village energy solutions.



The Rural Village Energy hub (RVE) delivers a triple bottom line benefit of humanitarian services, reduction in planetary stress, and profitability.

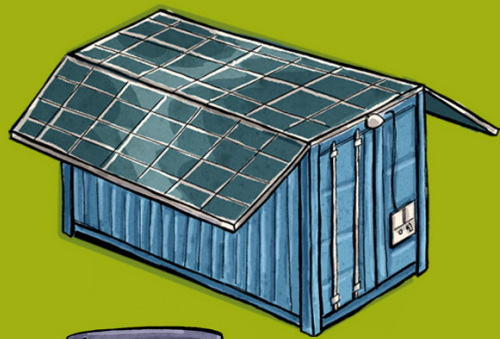
## LIFE CHANGING BENEFITS

The benefits to rural life and the environment in general, are many:

- + improved health due to reduction of raw water consumption and inhalation of fumes from open fire cooking and kerosene lamps
- + decreased use of and dependency on kerosene, wood, and coal
- + clean energy generated from renewable resources
- + improved agricultural output
- + reduced deforestation and carbon emissions as dependance on wood and coal decreases

Access to these services creates an impetus for increasing time available for productive, income generating tasks and increasing wealth over time.

**Only in this way can we enable communities to reduce poverty.**



## PRODUCT FEATURES

To reliably provide potable water, electricity, biogas and fertiliser to rural communities, the RVE relies on a number of discrete systems:

- + Solar photovoltaic plant to generate electricity during the day and store it for use at night
- + Anaerobic biogas plant
- + Water purification plant
- + Control and telemetry system and remote database

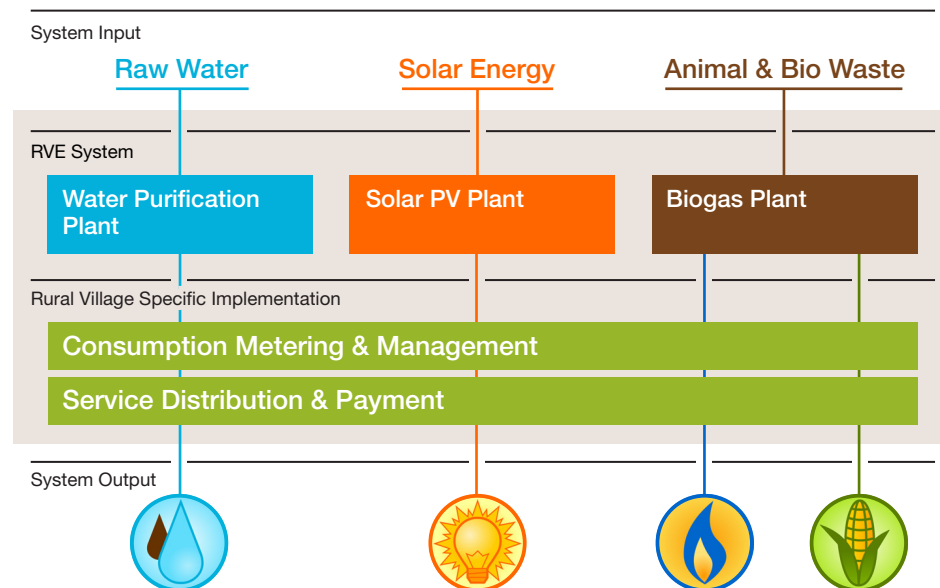
The [Kudura rural village energy solution](#) takes as input raw water, solar energy and animal manure. These are transformed into potable water for drinking, electricity for internal use and for provision to rural consumers, biogas for cooking, and organic fertiliser for agriculture. These services are distributed locally to meet consumer demand on a “pre-pay-for-service” basis.

## ELECTRICITY

The [RVE's solar photovoltaic \(PV\) plant](#) captures 825Wp of solar energy during the day; this energy charges a no maintenance battery bank rated at 800Ah which provides power at night. An inverter provides AC electricity for up to 20 homes concurrently – power is limited electronically at between 55W and 120W per home, providing enough power for two CFL lamps, mobile phone charging and powering a radio or small TV. This may seem very little power to those of us living in the developed world, but independent studies show that providing enough power to cover basic energy needs as a start, accelerates GDP and changes rural life forever.

# Changing Rural Life Forever

As raw input, locally collected cow manure, raw water, and energy in the form of solar radiation are converted to potable water, electricity stored in a high capacity battery bank, biogas stored in a large central reservoir and organic fertiliser. Payment for these services is on a “pre-pay-for-service” basis, usually via a mobile phone system. The availability of these basic services creates impetus for change in rural community behaviour with more time available for productive, income generating tasks. Ultimately, poverty is reduced as wealth increases.



As a power backup solution and to support higher power demand situations, a 5kVA self-start diesel generator is provided.

## BIOGAS

[RVE's Biogas generation plant](#) consists of a custom-designed two stage, batch-fed, temperature monitored anaerobic digester in which thermophilic digestion takes place. By creating an optimal environment (temperature and feedstock) for these bacteria to flourish, we generate increased quantities of biogas. Biogas is a natural gas, which when burned releases heat.

Fully automated, the system is designed for ease-of-use and low maintenance in rural areas. It is dimensioned to provide up to 4000l of biogas daily, with minimum methane content of 65%. A hydrogen sulphide (H<sub>2</sub>S) scrubber removes the corrosive H<sub>2</sub>S before the gas is provisioned for filling containers for use at home to cook. At a burn-rate of 125l/hour, we provide enough daily biogas for 10 families to cook for three hours a day.

## WATER

The [RVE's water purification system](#) is an on-demand, force-fed ultrafilter system

offering a 16m<sup>2</sup> filter area and a filtration rate of up to 1,200l/h. An internal 1000l buffer stores and pre-treats raw water with ultra-violet light.

Via the operator panel the vendor is able to dispense 5, 10 or 20 litres at a time, on-demand and in less than 80 seconds.

The RVE can provide enough drinking water for 200 people per day under normal use.

The ultrafilter provides removal characteristics that meet and exceed regulatory requirements for application of membrane filtration in drinking water treatment. The system has been proven to fully remove viruses, cysts, bacteria and parasites with greater than 99.99% effectiveness.

## REMOTE TELEMETRY

A [central monitoring system](#) monitors system function and provides remote management to the owner and our centralised remote monitor via a wireless data connection. Real time data access allows RVE.SOL to monitor all deployed systems remotely and track system performance over time. Predictive fault analysis techniques allow us to deploy maintenance proactively to ensure continued “quality of service” to our consumers.



**RVE.SOL - SOLUÇÕES DE ENERGIA RURAL LDA.**

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