



CLEAN ENERGY AND FERTILIZER

**THE INNOVATIVE
BUSINESS MODEL
OF SIMGAS**

**SIMGAS – A FOR-PROFIT BIOGAS
COMPANY IN EAST AFRICA**
KEN613



EEP
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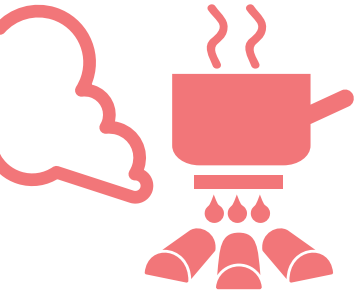




Customer with her double burner biogas stove that comes with her SimGas biogas digester

SimGas – a for profit vertically integrated biogas company that manufactures, sells and installs biogas systems for rural households in East Africa. SimGas is changing the lives of thousands of people:

biogas improves health, reduces energy costs, and increases farm revenues.

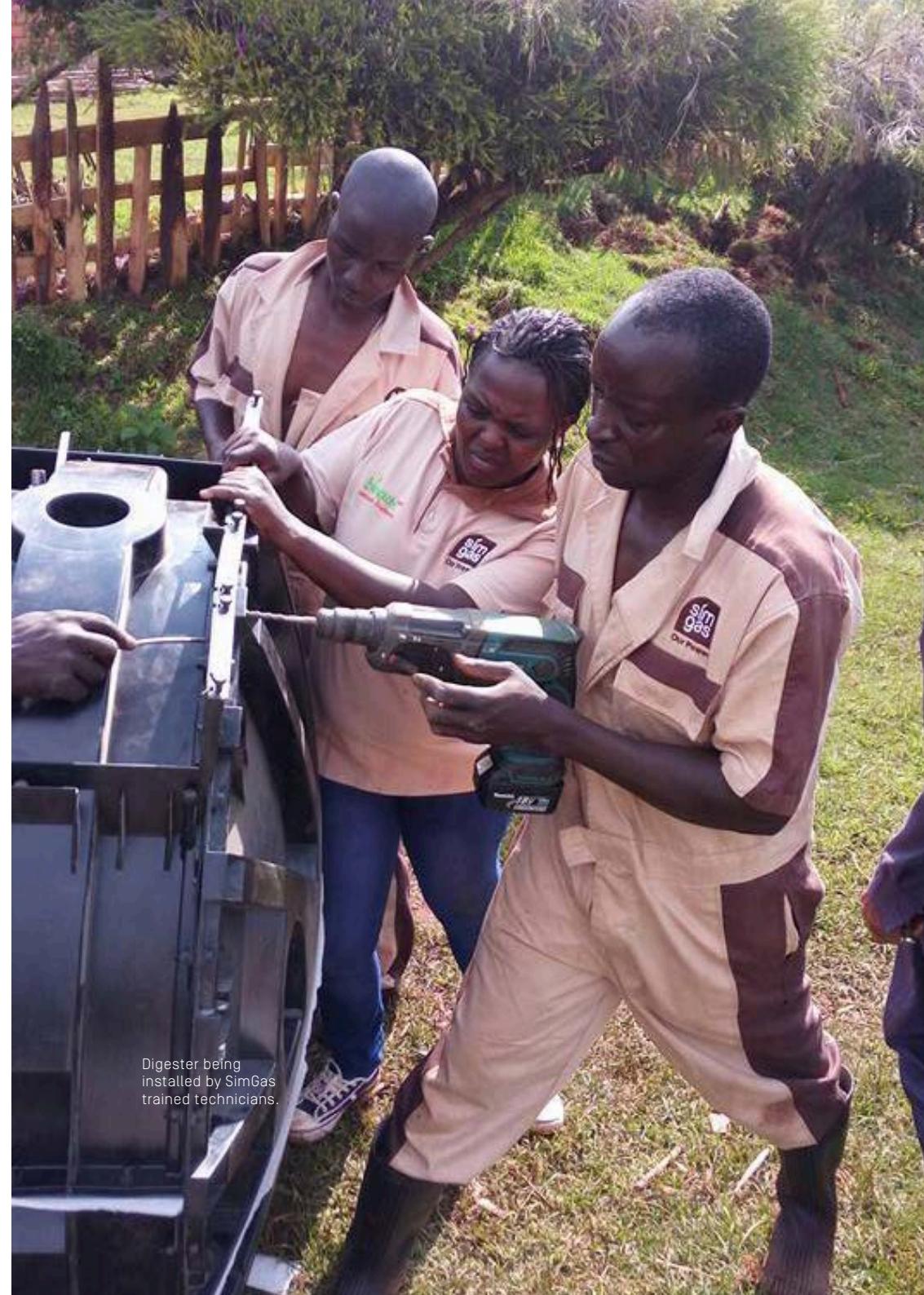


In East Africa, 95% of households use wood or charcoal. Cooking on wood fuel and charcoal is the main cause of indoor air pollution, which kills 4.3 million people annually, worldwide.

For 2 billion people, there are no alternatives: access to electricity for East-African rural households is <4-8% and NPG (natural piped gas) distribution is not cost effective. Typically, 35-45% of a household's budget is spent on fuel, and fuel availability is decreasing while prices are drastically increasing.

More than 3 billion people worldwide are being exposed to indoor air pollution while cooking their meals.

In order to meet their goal of providing sustainable clean fuel for cooking and power to 250,000 rural farming households in Kenya and Tanzania by 2022, SimGas designs, manufactures, sells and installs off-the-shelf domestic biogas digesters, called the GesiShamba, which produces biogas and organic fertiliser; two valuable assets that help to improve health, save money, and time.



Digester being installed by SimGas trained technicians.



SimGas production facility in Tanzania.

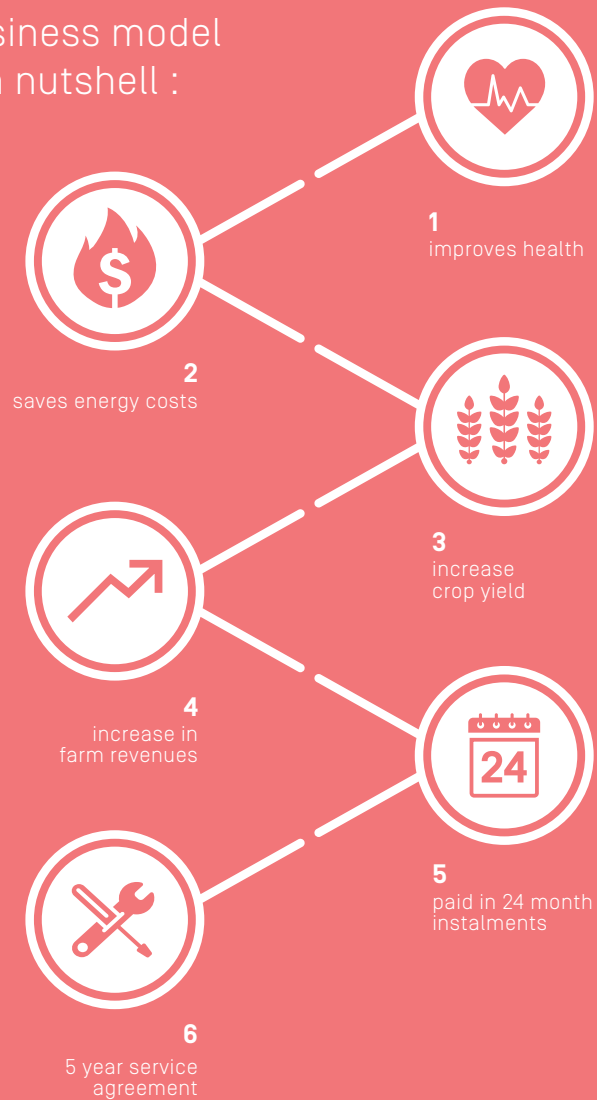
SimGas' off-the-shelf domestic biogas digesters are mass produced in durable HDPE plastic and consist of multiple parts, creating a modular system that is adaptable and scalable to customer's needs.

The GesiShamba is installed on the premises of the farming household. Every day, the farmer feeds the GesiShamba with manure from livestock and water, whereupon the digester produces biogas and bio-slurry, every day. Biogas is a fuel that burns clean. Biogas is a mixture of methane (CH₄) and inert carbon dioxide (CO₂). The produced biogas can be used directly by the household for their daily cooking energy needs, and thereby replaces wood fuel, charcoal and kerosene.



The GesiShamba provides the added benefit of production of fertiliser slurry which is used to improve crop growth. The improved crop yield is consumed by the household or sold at the local market, increasing income for the household. The improved cow fodder is fed to the cows, which in turn will produce more milk and manure. The cycle repeats itself, every day. As 99.1% of livestock holders in Tanzania also grow crops, the value of the fertiliser should be calculated as an integral part of the pay-off of the biogas system.

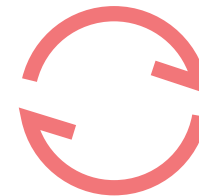
Business model in a nutshell :



As a direct result of the installation of the GesiShamba Systems, households are able to reduce energy expenditures and gain access to reliable power in the absence of power grids or presence of erratic power grids. In addition, alleviating dependence on fossil fuels removes the health hazards of indoor air pollution as well as providing time saving to the households.

“I’ve told just about all my neighbours how great and helpful the biogas system is. It has helped me to save costs and there is no more firewood smoke. The slurry is very helpful for my banana plants. They look better than ever, I am even planning on selling them!”

Mama Alinda Massawe, proud owner of a 6 cubic meter SimGas biogas system.



Each installed SimGas biogas digester reduces **8.2 tonnes CO₂-eq emissions** per households per year by replacing fossil cooking fuels with clean biogas.



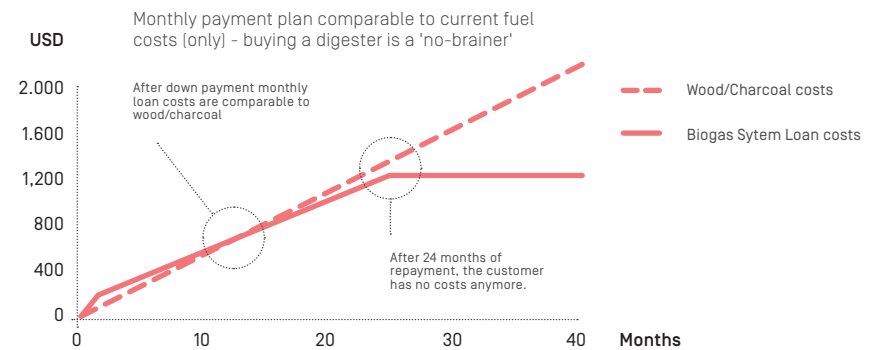
SimGas digesters installed in a customer's farm.

SimGas biogas systems are designed to reach millions of rural households. To date more than 1,000 systems have been sold in East Africa. The price of a GesiShamba varies depending on the size of the system installed.

The typical 24 month funding model for a 6m³ GesiShamba is illustrated below, showing the costs and financial benefits to the customer. Typically, the payback period for the system is less than two years. The model is based on a monthly payment of \$45 per month (depending on the loan offer) and an upfront payment of \$150.



A 6m³ GesiShamba is currently offered in Tanzania and Kenya for 2.7M TZS or 124,000 KES (approx. US\$1,200) in Tanzania and Kenya (incl. VAT). This includes the digester, a double burner stove, installation, piping, accessories, end-user training, 5 year service agreement and warranty.



GesiShamba Benefits

The investment case for the households is clear; what goes in is costless (readily available manure), what comes out saves money and boosts income:



Saves US\$636 per year on fuel costs per household;



Generates US\$408 per year per household, by using the bio slurry households experience up to a 200% increase in crop revenues;



Saves about 1.5 hours per day when going from making a fire to switching on a biogas stove in a matter of seconds;



Reduces emissions by 8.2 tonnes CO₂-eq per year per household;



Prevents deforestation by reducing consumption of 7.42 ton wood/charcoal per year per household;



Modular Design which enables expanding from 3m³ in 1m³ increments;



US\$200 discount provided to each customer through the sale of carbon credits;



5 year warranty / service agreement.

The upfront costs of \$150 appear high, but the full benefit range of the system should be considered when assessing the payback period for the households, as stated before.

The reduced expenditure on fossil fuels and the increased output of the land mean even lower payback periods. Based on the costs stated, fuel savings, and improved crop yield, and health care savings, the payback time of a 6m³ GesiShamba in Kenya and Tanzania is between 1-2 years.

The GesiShamba's modular design together with the 5 year warranty and service agreement, make this a highly competitive product. Local production facilities and local hub network that enables a fast installation, efficient transportation, and close relationships with customers, ensure that the systems have a high dissemination speed.



Maintenance and service costs for the first 5 years are included in the price. Thereafter, maintenance costs are borne by the customer and are anticipated to be less than \$15 per year.

The gas stoves and pipework may require intermittent replacement of small parts and as part of their ongoing commitment to support the communities, SimGas ensures that these parts are made available locally to the users through their local hub network. Each hub is stocked and staffed with technicians and sales reps that service a 10km radius around their hub. Currently SimGas has 40 hubs in Kenya and Tanzania, with projected growth to 80 hubs by 2020.



The innovation in the SimGas customer financing model, is the ability of SimGas to offer tailor made financial solutions for each client. This is done through SimGas in-house MFI in combination with the existing financial infrastructure of local dairy cooperatives.

The financial solutions are structured based on an upfront payment combined with set monthly payments for a specified duration. The durations for the monthly payment plans are set as 5 months, 12 months or 24 months, based on the customer's financial needs.

Another innovation in the business model is SimGas's ability to sell Carbon Credits [Gold Standard Clean Development Mechanism (CDM)] globally; the revenue from which is used to provide customers with an initial discount of US\$200 on the system. The current buyers of these carbon credits are the World Bank's Ci-Dev and the German Zukunft des Kohlenstoffmarktes under the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety.



For SimGas, the customer financial returns and providing a competitive technology solution are the key factors in the pricing of the system. The GesiShamba system provides a short payback period making the system a feasible investment from the household's perspective.



Happy customers with the SimGas clean cooking solution.

SimGas offers specific investment opportunities for investors seeking to strengthen their portfolio.

Current investors include informal investors, corporate venture capital investors, debt instruments with local banks, development finance institutions, and crowd funding.

The horizons and returns for investors are based on two investment models;

1

Investment into SimGas' in-house MFI – with Chinese walls – to provide the capital for customer lease financing in junior debt or senior debt (looking to raise 5M\$ in 2017, and more in 2018 depending on prospects).

2

Investment into SimGas' growth in East Africa: SimGas will expand within Kenya, to Rwanda, Uganda and Ethiopia with >80 SimGas hubs, aiming for an installation rate of 30,000 biogas digesters per year by 2020. SimGas will open an equity round in July 2017 to raise 4.5M\$ by 2018.

Sanne and Mirik Castro founded SimGas in 2009, with the idea to design and produce a highly scalable biogas digester that would provide clean energy and fertiliser for millions of rural households. 8 years on, SimGas is now, with support from EEP, a global business:

- ✓ In-house development of rural domestic biogas digester, peri-urban domestic biogas digester, domestic biogas-powered milk chiller.
- ✓ Local production in Tanzania and Kenya, able to produce 10,000 digesters/year
- ✓ 40 local SimGas hubs in Tanzania and Kenya
- ✓ Employs >80 personnel in Tanzania and Kenya
- ✓ Employs 12 personnel in the Netherlands
- ✓ Sold in excess of 2,000 biogas both rural and peri-urban digesters in Tanzania and Kenya



Since 2009, SimGas has established multiple entities, SimGas East Africa (est. 2011), two daughter companies in Tanzania (est. 2011) and Kenya (est. 2013), and a production facility in Tanzania (est. 2014) that was opened by Dutch Minister for Foreign Trade & Development Cooperation Ms. Lilianne Ploumen. The Tanzanian and Kenyan entities are responsible for local production and implementation in East Africa, whilst the headquarters in the Netherlands specialises in business development, engineering, design and research.

SimGas has a proven track record with EEP projects implemented in Kenya and Tanzania. The project is developing towards rapid expansion into Rwanda (2017), Uganda (2018) and Ethiopia (2018).

The target is to have over 80 local SimGas hubs throughout Eastern Africa by 2020. This expansion plan is coupled with increasing sales to more than 30,000 biogas digesters per year, and is to be facilitated through the in-house MFI.



SimGas digester being installed by one of the many SimGas trained technicians.

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Office address:
Cnr The Hillside st and Klarinet rd
Lynnwood, Pretoria, 0081, South Africa

eepafrica.org
eep.eco@kpmg.fi

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EEP S&EA service provider:



Project contacts:



Our Power

Sanne Castro - CEO / Co-founder
www.simgas.org
sannecastro@simgas.org
+31 64 540 6419