We are pleased to inform and update you on our latest innovation

The BioGas Milk Chiller
Why the Biogas Milk Chiller?

We help processors meet a growing demand for milk by activating the power of off-grid farmers.
Why the Biogas Milk Chiller?

In East Africa, demand outpaces supply 2:1 as consumers thirst for more milk from brands they trust.
Why the Biogas Milk Chiller?

Outlook 2020: Milk Demand Growth vs. Milk Supply Growth

Source: Fonterra, 2015

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Why the Biogas Milk Chiller?

But right now, only a fraction of milk makes it to market, often because off-grid farmers cannot keep it cold overnight.
Why the Biogas Milk Chiller?

If milk spoilage can be prevented, there is a huge market opportunity for off-grid farmers and the dairy industry.

Milk production in 2013 in million metric tonnes

- 155 Delivered to dairy processor
- 29 Not delivered to dairy processor
- 149 Delivered to dairy processor
- 31 Not delivered to dairy processor
- 87 Delivered to dairy processor
- 35 Not delivered to dairy processor
- 35 Delivered to dairy processor
- 31 Not delivered to dairy processor
- 23 Delivered to dairy processor

Source: IFCN Database 2014

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Why the Biogas Milk Chiller?

It’s time to unlock the promise of night milk.
Why the Biogas Milk Chiller?

We target small scale dairy farmers with 2-10 cows because that’s where both the problem and the solution is found.

Average farm size
Milk animals per farm
(cow & buffalo)
- <= 10
- > 10 <= 30
- > 30 <= 50
- > 50 <= 100
- >= 100

A 10L cooling capacity is sufficient for the average farmer living in East & West Africa and almost all of Asia

© SimGas Holding BV 2017

Source: IFCN Database 2014
Why the Biogas Milk Chiller?

Our milk chiller allows dairy farmers to cool, store and sell more milk, increasing supply across the chain.
How does it work?

- 100% Powered by biogas
- Runs on any type of domestic anaerobic digester
- Applies the proven, reliable technology of absorption cooling
- Tailored cooling capacity of 10 Litres milk of night milk
- Cools milk within 4 hours from 35°C to 7°C
- Low gas consumption leaves enough gas to cook
How does it work?

**ICE COMPARTMENT**
Ice is stored in the aluminum compartment. This ice is used for cooling the milk. More ice means colder milk.

**MILK COOLING COMPARTMENT**
When you place the milk-can in the water, the ice melts and the milk is cooled.

**BIOGAS FLAME**
When this flame is ON, ice is made in the ice compartment. The longer the flame is on, the more ice is created.

**EXTRA COOLING COMPARTMENT**
You can keep other products cool in this compartment like vegetables.
As an active member of the local dairy cooperative, Grace receives a text message from the cooperative notifying her on the newest development: a new device that provides on-farm, off-grid milk chilling will be launched soon! Exciting! Maybe she can find out more at the milk collection center where she delivers her morning milk. Indeed, one of the center’s representatives is handing out invitations to the demonstration of the ‘biogas milk chiller’ next week!

Grace delivers most of her milk (8 L from morning, 5 L from evening) to her local milk collection center (5 km away from her house) while 2 L is left for home consumption. A couple of times last week her evening milk was rejected at the collection centre because it had gone sour overnight. She has no option to maintain the milk quality by cooling, so she is left with two options: either she could try to sell the evening milk to neighbors at a potentially lower price or take the time and the risk of delivering the evening milk in the pitch dark, dangerous route to the milk collection center.

Customer Journey of Ms Grace Massao

- Dairy farmer with 4 dairy cows
- 35 years old, lives with her husband and 3 children in rural Tanzania
- No access to a (reliable) electricity grid
- Owns a SimGas biogas digester since 2013 for cooking energy.

As an active member of the local dairy cooperative, Grace receives a text message from the cooperative notifying her on the newest development: a new device that provides on-farm, off-grid milk chilling will be launched soon! Exciting! Maybe she can find out more at the milk collection center where she delivers her morning milk. Indeed, one of the center’s representatives is handing out invitations to the demonstration of the ‘biogas milk chiller’ next week!
Grace arrives at the dairy cooperative; the launch and demonstration of the ‘biogas milk chiller’ has just begun. She sees a man with a ‘SimGas’ T-shirt - the same company of her biogas system! He’s showing the crowd how the device works and lets Grace open the lid, put in milk churns, and push the ‘on’ button. She asks him about the costs, whereupon he makes a quick, tailored cost-benefit calculation for her, and offers to make an appointment for her with a SimGas sales agent.

The appointment with the SimGas sales agent is at the office of Grace’s dairy cooperative. Together they discuss various payment options. Grace chooses for the milk-check-off option, which allows her to pay off the biogas milk chiller by installments through every milk sale made to the milk collection center. This way, it will take Grace one year to pay off the system. She signs the sales contract, payment agreement and servicing agreement.

A SimGas Call Center representative calls Grace to make an appointment for delivery and training. Is tomorrow afternoon OK? It is! Two SimGas guys deliver the brand new biogas milk chiller and Grace tells them where they can place it. They connect the device to the family’s biogas digester and do a thorough quality control check. Who will handle the milk chiller, they ask. I will! says Grace. In the next half hour, Grace is given a full training on the use and maintenance of the device.
It’s 5 PM: milking time! After milking her four cows and filling up the two milk churns, Grace puts the milk churns into the milk chiller device, closes the lid, and presses the ‘on’-button. The milk chiller immediately starts chilling the milk. In four hours time, the milk will be 7°C, and will stay at that temperature throughout the night! She can lay back now and relax – there’s no need to deliver the evening milk to the collection center, she can wait until tomorrow morning!

It’s 7 AM: milking time again! After milking her four cows and filling up more milk churns, Grace takes out from the milk chiller device the churns that contain the chilled evening milk from yesterday. She then delivers her four milk churns all at once at the milk collection center. They are impressed with Grace’s milk: what a superb quality! Good quality comes with a good price! With the sale of her milk, she makes her first payment for the device.

It’s been a week since she first started using the biogas milk chiller when Grace receives a call from the SimGas call center: Is everything working out with the biogas milk chiller? Grace tells them that the device is working well, and that all of her milk has been accepted! Her neighbors have already come to visit to check out her new device and want one too! Can you take care of that please? Sure! Should you have any problem in the future, please call and we’ll fix it. Sawa!
What is the status of the project?

- 3x version 1 prototypes tested in the lab (2014); proof of working principle
- Market assessed in Kenya, Tanzania, Zambia, Rwanda by SNV (2015+2016); proof of market potential
- 4x version 2 prototypes tested in Tanzania (2015); proof of concept in the field
- 14x version 3 prototypes tested in Kenya and Tanzania (2016); value proposition assessed for farmer as well as cooperative, together with IDEO.org
- 3x version 4 prototypes tested in Kenya, ongoing (2017); optimised efficiency, usability and lower costprice

Next step: Pilot with 200 milk chillers in Kenya to proof impact at scale, on the whole value chain (2018)

Latest model, field test in Kenya
What did farmers say about the chiller?

“I would love to cool other stuff too, like fruits and veggies”

“As long as we live in the new world we should advance and go where the world is going.”

“I would like to know how cold it is. 10C will be enough. 4C is too cold, almost ice!”

“I decided to risk it because of my afternoon milk production that I can’t sell.”

“I got the chiller because I don’t want to suffer”

“When it is too hot in the dry season, sometimes even the morning milk gets spoiled.”

“When I put it in there [in the milk chiller], I am sure my milk will be good.”

“I want my neighbours to come and see what I’m doing. They would want to be like me!”

“Afternoon milk we would boil because we didn’t have the chiller. Now I do not have to boil it and my husband takes it to the dairy.”

“Now I can deliver morning milk and afternoon milk together!”

“It needs to be in the kitchen. The limited space is no problem, because it is not the mistake of the machine. We might need to move the wall.”

“Sammy told me it was the best thing he got, the chiller. Because he can’t deliver his afternoon milk.”

“We decided to buy the milk chiller, to bring more milk to the dairy.”

“Modern technology is here. Why should we go back?”

“Dairy is my leading investment because income is stable... not like maize farming where it is only once a year.”
What did East-African dairy experts, Co-ops & Processors say?

“This product is a no-brainer for us. We think we could easily increase the amount of milk when farmers would have a milk chiller. We need to convince the farmers of the BMC together”

“At the moment, they [processors] know they don’t get all the milk from the farmers. They think they could get all the milk when they keep offering services as veterinary, possibility to buy feed, trainings on hygiene etc.”

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“There really is demand for biogas. Biogas improves the life standard so, so much. Women just turn on the gas, cook, then kids go to school.”

“The processor requires certain quality standards. We have to be very strict with our farmers.”

“At the moment, they [processors] know they don’t get all the milk from the farmers. They think they could get all the milk when they keep offering services as veterinary, possibility to buy feed, trainings on hygiene etc.”

“If we had more money, I would invest more in our members. Farmer is key. Without them, there is no value chain. We value them so much.”

“If the farmer chills his milk, it will cut our energy costs, which is now KES 100,000 a month!”

“The challenge is to collect evening milk. Transportation is our highest cost: KES 400,000 a month. In a perfect world, no more transport between farmer and cooperative; direct delivery from farmer to cooperative.””

“The best farmer is an early adaptor, has biogas, is loyal, brings consistant milk volume, is willing to train other farmers, keeps records, uses bioslurry as fertiliser. Worst farmer just brings milk, gets money and leaves, and doesn’t adopt after trainings.”

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What do we want to achieve?

Our dream is that by 2025, milk spoilage by off-grid dairy farmers is something of the past;

The Biogas Milk Chiller shall be a widely accepted link in the cold chain for emerging dairy sectors worldwide.