

Rwanda's deadly methane lake becomes source of future power

May 25 2014, by Stephanie Aglietti



A man looks towards the hills of Rwanda on the eastern edge of Lake Kivu from the Democratic Republic of the Congo's eastern city of Goma on May 28, 2012

Beneath the calm waters of Lake Kivu lie vast but deadly reserves of methane and carbon dioxide, which Rwanda is tapping both to save lives and provide a lucrative power source.

Plans are in place to pump out enough gas for power that would nearly

double Rwanda's current electricity capacity, as well as reducing the chance of what experts warn could be a potentially "catastrophic" natural disaster.

The glittering waters of the inland sea, which straddles the border of Rwanda and the Democratic Republic of Congo, contain a dangerous and potent mix of the dissolved gases that if disturbed would create a rare "limnic eruption" or "lake overturn", expert Matthew Yalire said.

Levels of [carbon dioxide](#) (Co2) and methane are large and dangerous enough to risk a sudden release that could cause a disastrous explosion, after which waves of Co2 would suffocate people and livestock around, explained Yalire, a researcher at the Goma Volcano Observatory, on the lake's DR Congo shore.

"Right now the lake is stable, but for how long?" asked Yalire, who believes that extracting potentially explosive methane is one way to help "stabilise" the lake.

Near the town of Rubavu, a pilot project of the Rwandan government is already producing about two megawatts of electricity from the methane in the lake.

But a new, additional plant is being built on Kivu's eastern shore, where the US-based power company ContourGlobal plans massively to boost production.

"Our team is focused on extracting methane from the lake to generate electricity that will expand household access to power, lower costs, and reduce environmental hazards," ContourGlobal said.

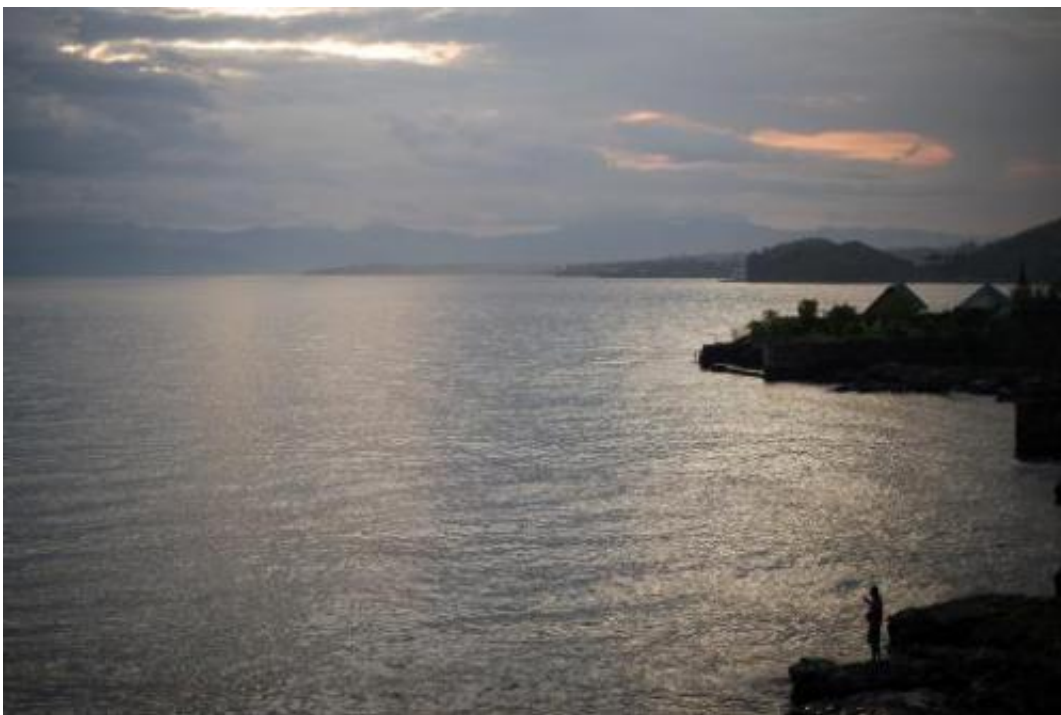
Its 200 million dollar (145 million euro) "KivuWatt" project aims to lessen the natural threat of an explosion, while turning the deadly gas

into a source of energy and profit.

Two million people at risk

On the lake's Rwandan shoreline and at the foot of green hills dotted with banana plantations, hundreds of construction workers are building a platform due to be installed on the lake by the end of the year.

Rather than being a drill platform, it will instead suck up the methane trapped in the depths.



A man fishes on the edge of Lake Kivu on May 28, 2012 near the city of Goma in North Kivu province in the Democratic Republic of the Congo

"There is no drilling, gas is pumped from the lower layers of the lake

that are saturated with methane," the KivuWatt project's chief, Yann Beutler, told AFP.

"From the moment when the water rises to the surface, it releases gases that are collected."

The methane and Co₂ are separated, with the methane sent to a plant on the shore and the Co₂ re-dissolved and returned to the depths of the lake.

"The structure of the lake, and the flora and fauna, are not changed," Beutler added.

The project's first phase is planned to generate over 25 megawatts of energy, with production to be multiplied four times in the second phase to 100 MW, almost doubling Rwanda's current national production capacity of about 115 MW.

The scheme is largely financed by private capital, though some 45 percent of the funding takes the shape of loans from international development institutions.

ContourGlobal has signed a 25-year concession with the Rwandan government and an agreement with the country's national power producer and distributor.

Lessons from Cameroon

The electrification of Rwanda is a top objective of Kigali's government, which aims to more than triple access to electricity from a mere 18 percent of the population today to 70 percent by 2017.

The methane will also help Rwanda fulfil the further goal of diversifying

energy sources.



A view from a UN base on the edge of Lake Kivu in the Democratic Republic of the Congo's eastern city of Goma on May 28, 2012 shows the hills of Rwanda in the background

Today, almost half of its energy comes from fossil fuels, with the annual bill for imported fuel topping some 40 million dollars (30 million euros).

Kivu is not unique: two other lakes in Cameroon—Monoun and Nyos—have similar high concentrations of the gases. In 1984, a limnic eruption killed 37 people around Lake Monoun, then in 1986 a similar disaster at Lake Nyos claimed more than 1,700 lives. These tragedies have been seen as dire warnings for people near Lake Kivu.

"It is essential to extract the gas from the lake," said Martin Schmid, a

researcher at the Swiss Federal Institute of Aquatic Science and Technology (Eawag).

"If we let the gases accumulate for a long time, we should expect at a catastrophic eruption of gas."

Stretching over 2,370 kilometres squared (915 miles squared) and plunging to some 485 metres (1,590 feet) deep, the lake holds some 60 billion cubic metres (2,118 billion cubic feet) of dissolved [methane](#) gas, and some 300 billion cubic metres (10,594 billion cubic feet) of carbon dioxide.

With some two million people living close to the lake shore in both Rwanda and DR Congo, any eruption could be disastrous.

An active nearby volcano, Mount Nyiragongo, which smothered part of the Kivu lakeshore city of Goma with lava in 2002, highlights the real risk that geological activity in the lake could trigger an explosion.

Both the [lake](#) and volcano are located on Africa's continental Rift zone, where the Earth's tectonic plates are very slowly being pulled apart.

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