SHEMA POWER LAKE KIVU LTD.

KIVU56 METHANE GAS TO POWER PROJECT

GISENYI

Date: May 2021

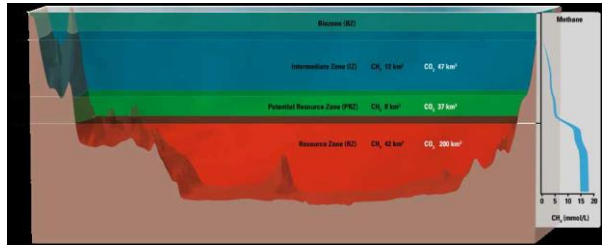
PR-K56-PM-0017

SPLK IN RWANDA - LAKE KIVU

A UNIQUE RESOURCE

- Lake Kivu is located on the border of Rwanda and the DRC and is over 2400 km^2 and up to 485 m deep.

- Dissolved in its waters is over 350 billion m^3 of biogas, of which approximately 62 billion m^3 is methane, providing a generation potential of at least 350 MW for Rwanda for 40 years.



HISTORY OF GAS EXTRACTION

FULL SCALE COMMERCIAL PLANTS ARE NOW OPERATING SUCCESSFULLY ON LAKE KIVU

- Methane was first extracted by Union Chimique de Belge in 1963 to supply the local Brewery with 5,000 m^3 of gas per day. The operation ran until 2004.
- GoR developed a pilot gas power plant, Kibuye Power 1 (KP1), which has been producing 3.6 MW of power since late 2007. Implementation by SPLK's local partner Alexis Kabuto
- In 2011, Contour Global secured financing to develop a 25 MW methane gas-fired PP. This was successfully commissioned in late 2015
- SPLK signed Kivu- 56 MW PPA in December 2015 and a revised PPA was Signed on 29th of March 2019.
- Total power available to the grid on Lake Kivu by SPLK will be 56 MW in 2022.
- Total Installed Capacity 76MW
- A further concession has been granted to GASMETH for alternative use purposes - LNG

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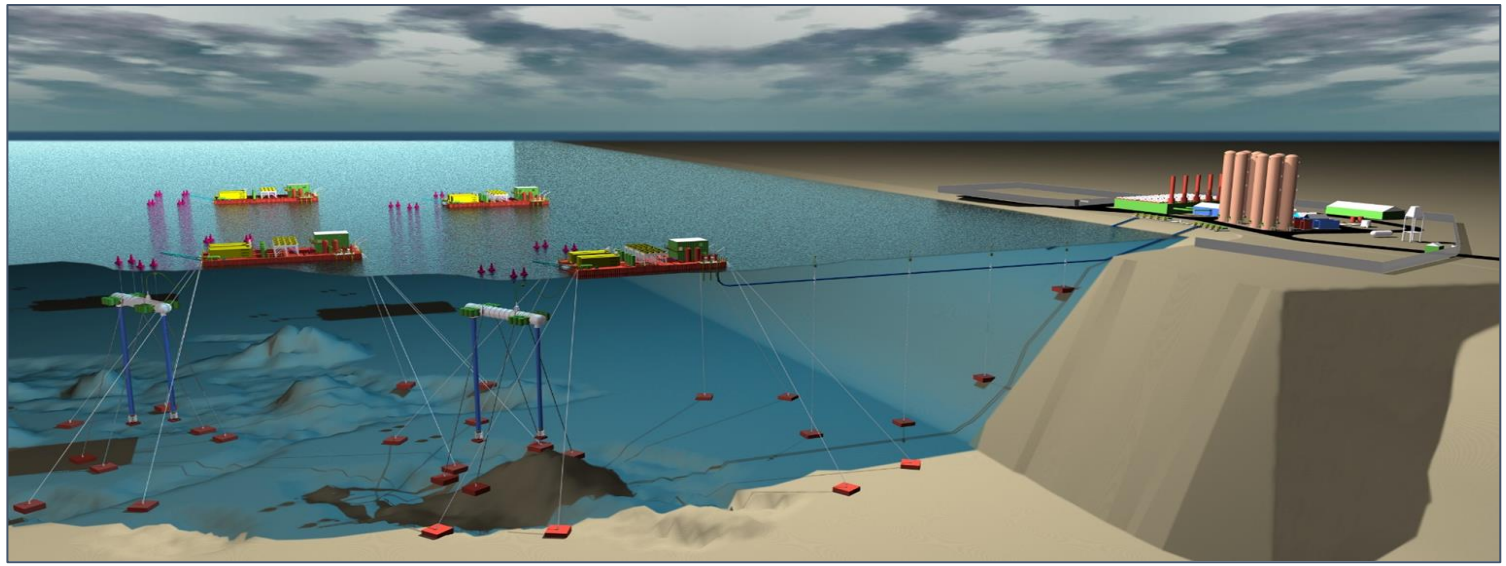
IMPROVED TECHNOLOGY

GAS EXTRACTION AND PROCESSING OVERVIEW

- The gas plant consists of free-standing riser and separator systems which draw up the gas rich water, separate the gas and return the degassed water to the appropriate depth via a second riser
- Four offshore barges, each supporting two gas trains, support compressors to send the raw gas to the onshore site, via 5 km export pipelines.
- Onshore, a standard wash water system is used to concentrate the methane and thus produce a fuel gas suitable for supply to the power plant. Excess CO_2 is reabsorbed into the wash water and fed back into the lake beneath the biozone.



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Developing the Kivu56 project in Rwanda

- The development of this project was simplified by **Rwanda Development Board**, which operates as a convenor of various government departments
- Government of Rwanda (GoR) has a good strategy in various sectors and a straightforward methodology of implementation.
- Projects generally governed by the Investment Code which details procedures and benefits in strategic sectors. New code promulgated in 2021.
- Good access to necessary decision makers when processes get stalled.
- Very bureaucratic and lengthy processes impact project planning and execution
- GoR is very investor friendly and processes around Work Permits is in my view rivalled by no other country in Africa. Work Permits are issued in 7 days as long as the correct paperwork is submitted
- Safe and Secure environment
- Logistics is challenging given the distance from ports
- Customs processes are demanding and subject to constant change

Developing the Kivu56 project in Rwanda

- Skills are available in certain areas and the work ethic of Rwandese is excellent
- Living costs in Rwanda are reasonable and standards high
- Air links are well serviced to South Africa and Europe
- Banking System is quite manual, but has improved over the past year
- Forex flows freely and payments offshore are relatively simple
- Tax compliance is strictly enforced and fairly complex due to various interpretations
- WHT and Reverse VAT is strictly enforced and in reality all services from outside Rwanda result in both WHT and Reverse VAT been an add on cost.
- Local licences, cleaning fees, strict enforcement of payment deadlines add to administration burden and costs.

A good administration team is vital

Developing the Kivu56 project in Rwanda

July 2019

December 2019

April 2021

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Project Time Line

Milestone	Date
Ground Breaking	November 2019
First Gas	July 2021
First Power – 14MW	August 2021
Second Power – 28MW	September 2021
Third Power – 42 MW	November 2021
Fourth Power – 56 MW	January 2022
Commercial Operation Date	March 2022