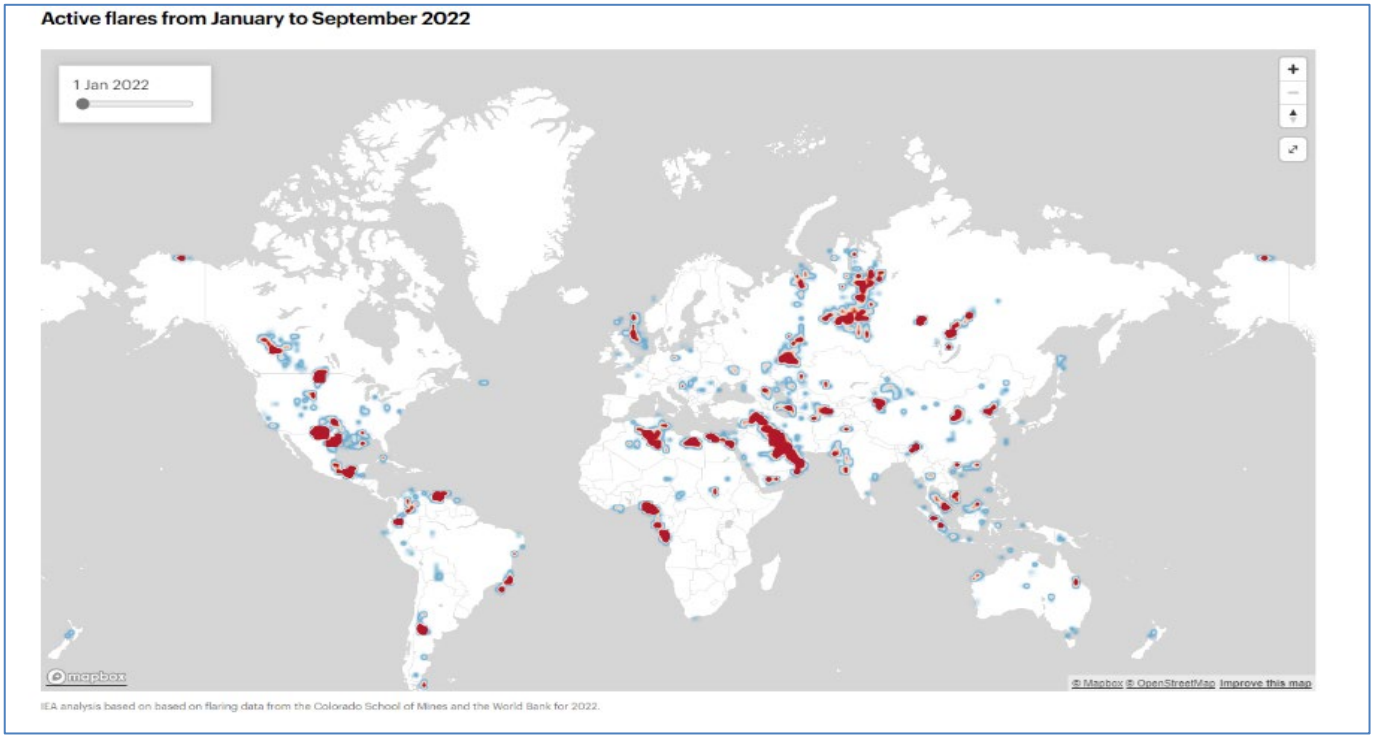

GR2 Engineering Modular Solutions for Xenergi LTD, Enabling Sustainable Energy Generation from Flare Gas in Nigeria

The environmental impact of flare gas emissions from oil and gas production facilities has received increasing attention in recent years. Flaring is a common practice in oil production used to burn off associated gas to ensure the flow assurance of the output. However, it is an inefficient and wasteful process contributing to climate change and widespread environmental pollution. GR2 has developed a modular flare capture and processing solution to address this issue, harnessing the wasted energy resources and reducing emissions.

According to the IEA's 2023 Methane Tracker Report, more than 260 billion cubic meters (BCM) of natural gas is wasted through flaring and methane leaks globally today. Flaring in the oil and gas industry results in more than 500 million tons of CO2-equivalent annual greenhouse gas emissions[1], including both CO2 caused by flaring and methane emissions.

Reports published by organizations such as the International Energy Agency (IEA), the World Bank, and the United Nations point out that while Russia, Iraq, Iran, the United States, Algeria, Venezuela, and Nigeria produce 40% of the world's oil, these seven countries consistently contribute 65% of global gas flaring. The U.S. has played a significant role in the worldwide decline of gas flaring through innovative engineering solutions and improved infrastructure utilization, as well as helping other countries achieve global climate targets.

With almost 8 billion cubic meters of gas flared annually, Nigeria is one of the world's seven largest contributors to gas flaring. According to The Guardian[2], a Nigerian news source, NNPCL, Shell, ExxonMobil, Chevron, Total, and other oil companies operating in the country flared about $3.9 billion worth of gas in the last four years, as of September 2023. At the same time, about 92 million people in Nigeria lack access to power, per the Energy Progress Report 2022 released by Tracking SDG 7. The gas flared by these companies could have been harnessed for electricity generation. In fact, per the same source, the four-year flare alone could have produced approximately 128,500 gigawatt-hours (GWh) of electricity for Nigerians. Monetizing the flare gas can significantly contribute to Nigeria's power needs and its economy.

Nigeria has committed to Net Zero Flaring by 2030. With the support of USTDA, GR2 has been working with local operators and regulators and selected

[1] https://www.iea.org/reports/global-methane-tracker-2023/overview

[2] https://guardian.ng/six-years-after-nigeria-awards-49-gas-flare-sites-to-42-investors-2/news/

technology solution providers in the U.S. to monetize flare gas.

GR2 has developed a comprehensive FEED study funded by the United States Trade Development Agency (USTDA) for **Xenergi LTD**, a Nigerian midstream operator dedicated to capturing and monetizing flare gas in the Niger Delta region of Nigeria. The GR2 study lasted for over 12 months. The study resulted in technically and economically feasible solutions for flare gas quantities between 1 mmscfd and 200 mmscfd, including modular methanol, LNG, M15, Power, and NGL production solutions from qualified U.S. technology and engineering companies. The following principles are considered as the critical futures to the studied solutions:

1. Proven, scalable, and repeatable solution with qualified suppliers
2. Adaptability of the solution to various flare gas compositions and location
3. Positive environmental and social impact of the solution
4. Ease of deployment, quick installation, reliable operations and maintenance, flexible capacity, and mobility of the solution

GR2's first modular flare processing plant was deployed in Nigeria by Xenergi LTD in 2023. The flexible capacity unit is designed to capture and process flare gas using a non-hydrocarbon-based refrigeration process. The main unit has developed to adapt various flare gas compositions quickly through plug-and-play type conditioning and treatment modules. The GR2 flare processing plant is capable of operating with a zero-flaring option. The plant is also designed to generate its fuel from the flare gas required for operations, enabling it to be used in remote places without direct access to power.

The GR2 modular flare processing plant unit has a flexible capacity with an 8:1 turndown ratio. It processes the flare gas to pipeline spec natural gas by separating and stabilizing valuable NGLs for on-road truck delivery for refineries and chemical feedstock.

GR2 modular flare plant offers several advantages over conventional methods, including operational flexibility, cost-effectiveness, and scalability. The units can be deployed near the flare source, minimizing the need for extensive infrastructure and reducing construction and installation costs.

Modular flare capture plants represent an innovative and effective solution to mitigate the negative environmental and economic impacts associated with flaring. These plants offer multiple advantages by capturing and utilizing flare gas, including energy recovery, emissions reduction, scalability, and cost savings. However, successful implementation requires addressing available infrastructure, operational considerations, and regulatory compliance. With the right approach and stakeholder collaboration, modular flare capture plants can play a pivotal role in promoting sustainable energy generation and reducing greenhouse gas emissions from the oil and gas industry.

About GR2 Engineering Inc., Houston, Texas:
GR2 Engineering provides EPC solutions and engineering consulting services to energy, infrastructure, and industrial projects. We are committed to environmental stewardship and aim to deliver safe, sustainable, and efficient execution for small to mid-size capital projects. GR2 has extensive experience in gas treatment, CO2 processing, emission mitigation, process technology selection, design, and modularization. GR2 offers proprietary, US-built, modular process plants to oil and gas, chemicals, and industrial manufacturers for greenhouse emission mitigation and flare gas monetization projects. GR2 modular plants are designed for quick installation and safe operation for existing facilities and greenfield projects worldwide. GR2 represents a robust network of small and mid-size American equipment and fabrication partners for domestic and international projects.

Contact info@gr2engineering.com for more information on GR2's project solutions.

About Xenergi Ltd., Nigeria
Xenergi is a Natural Gas technology company and a member of the Oildata Energy Group. It converts Flare Gas into cleaner energy products such as Natural Gas, LPG, Propane, and mixed alcohols. Xenergi's modular energy solutions help convert stranded gas from small and remotely located sources into portable, cleaner energy and valuable chemical products. Xenergi pioneered an innovative clean energy initiative providing health and economic benefits to rural communities in Nigeria through its LPG Exchange And Power (LEAP) program. LEAP is designed to permanently substitute kerosene and biomass fuels for cooking through our modular gas processing plants' broad distribution of environmentally friendly LPG.

Contact info@xenergitech.com for more information on Xenergi's modular plant solutions.