

Gaffney  
Cline

East Africa Expertise



## About GaffneyCline

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GaffneyCline is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector since 1962. GaffneyCline's reputation demonstrates that its advice, along with its insight, is high-quality, impartial, technically based, and commercially astute. GaffneyCline is often referred to as one of the leading Reserves consultants within the industry, but in reality, GaffneyCline offers a full range of upstream, midstream and downstream technical and commercial consultancy services. These include seismic interpretation, static and dynamic reservoir modelling, field development planning, field engineering, gas monetisation, LNG/GTL, expert witness, mergers and acquisition, economics and project finance. GaffneyCline operates worldwide from three main offices in London, Houston and Singapore, and from regional offices located in Buenos Aires and Sydney.

## East Africa

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East Africa is an area where GaffneyCline has considerable experience and continues to be very active.

The petroleum systems of onshore and offshore East Africa are very different. Onshore exploration successes, exemplified by those in the Albert Basin of Uganda and Lokichar Basin in Kenya, are oil discoveries in Tertiary aged sediments and are associated with the East Africa Rift system. The offshore deep water gas discoveries of Mozambique and Tanzania are typified by sandstone reservoirs deposited in a deep water fold and thrust belt. A third petroleum system is much older and is exemplified by Mesozoic aged sediments seen on the island of Madagascar, as well as the petroleum system of South Sudan and its potential extension into Kenya, Ethiopia and adjacent areas.

Deep water sands of Tertiary and Cretaceous ages, offshore Mozambique and Tanzania have proved to be amongst the most prolific offshore gas basins in the world, with some 185 Tcf of natural gas resources having been discovered since the first well completed in March 2010. Given the length of the coastline (about 4,000 miles from Somalia to South Africa) and the licenses around surrounding islands (e.g. Madagascar and Comoros), the deep water of the region remains largely unexplored with only 90 wells drilled in the last ten years; 85% of which are within a 250 mile "golden-zone" running either side of the Tanzania-Mozambique border.

GaffneyCline has worked in all of these basins and areas, each of which poses different challenges for successful discovery, development and monetization of resources. GaffneyCline activity in these relatively new petroleum provinces is still largely Upstream focussed and includes: advising on portfolio building and exploration, Reserves and Resources reporting, gas/LNG developments, CPR preparation for stock market listings, mergers and acquisitions, as well as being an Expert Witness.

Downstream advice such as refining studies and gas monetization is increasingly required. GaffneyCline's clients range from Small and Independent exploration and production companies through to Supermajors, as well as financial institutions, NOCs and government Ministries. GaffneyCline is uniquely placed for work in the region, having experience across the full life-cycle of East African assets.

Some examples of GaffneyCline's recent East Africa projects follow.

# Our Experience

## Albert Graben Exploration, Uganda

For an international client considering acquiring an interest, GaffneyCline reviewed three exploration blocks and a number of oil and gas discoveries located in the Albert Graben of western Uganda. The GaffneyCline team reviewed all petrophysics, volumetric estimates and the conceptual development plans (including anticipated production profiles and Capex/Opex estimates) and provided an independent opinion on the Seller's reserve/resource estimates.

## 1st Licence Round, Uganda

For a potential investor in the First Ugandan Bidding Round, GaffneyCline undertook a review and provided a techno-economic assessment of two Ugandan Exploration Licences (with discoveries) in the Albert Graben using data provided by the Ugandan Ministry. This review included an independent evaluation of the technical, economic and commercial potential of the discovered resources and the remaining prospectivity in the blocks evaluated.

## Refinery Feasibility Study, Uganda

GaffneyCline worked with a major engineering contracting company on a refinery feasibility study on behalf of the Ugandan government. GaffneyCline's product market/pricing study assessed both the mix, and scale, of refined product demand that the new refinery might expect to meet in the coming decades, and realizable product prices netted back to the refinery gate. GaffneyCline analysed the economic attractiveness of various refinery development scenarios and financing options. GaffneyCline also advised the engineering contractor on the appropriateness of upstream field development concepts and profiles, and, in workshops with the Government, discussed the implications of the refinery project for the country's economic development and the development of its national hydrocarbon resource sector.

## Crude Export Pipeline Advice, Uganda

GaffneyCline analysed refining costs (in conjunction with an engineering contractor) to advise the government on the economics of constructing a crude oil export pipeline and the associated handling and transit fees.

## Portfolio Valuation, Tanzania

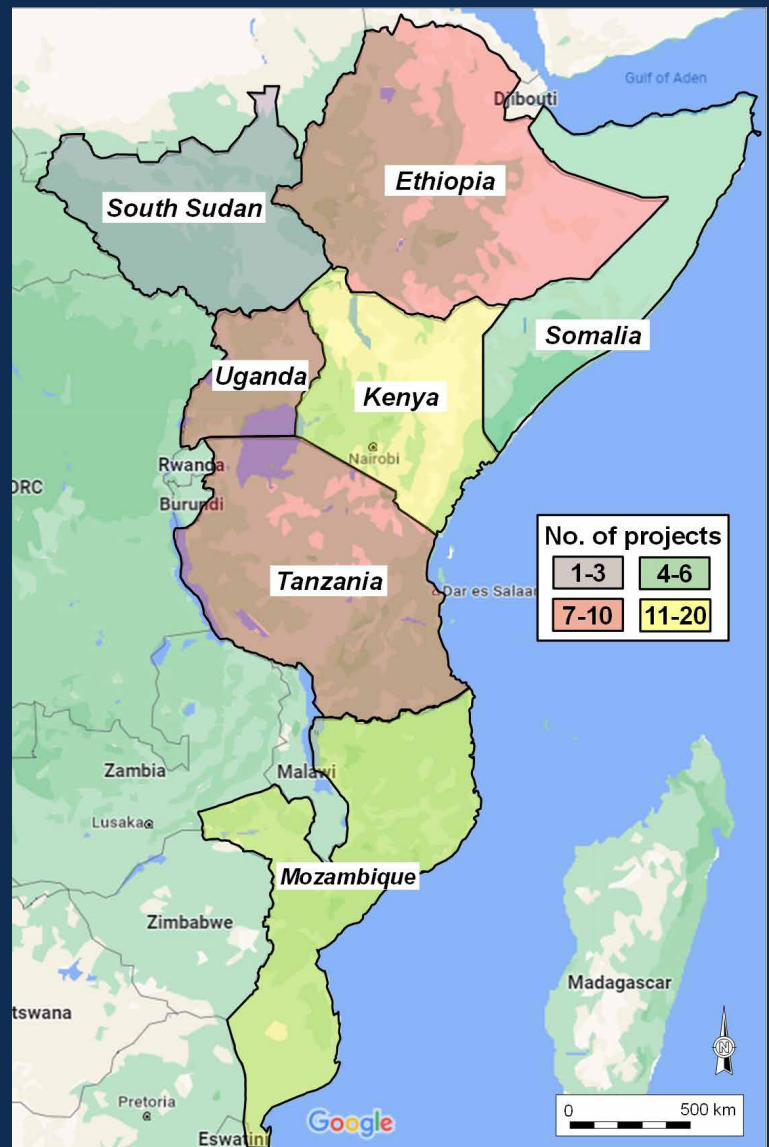
GaffneyCline performed an evaluation and valuation of equity investments in a frontier exploration portfolio that included multiple offshore licences. The equity investment was successful, leading to acquisition of multiple 3D seismic surveys revealing more than 20 TCF Gas in Place in a string of discoveries and leading to LNG planning.

## Tanzania – LNG Export Facility

TPDC (Tanzania Petroleum Development Corp.) has chosen GaffneyCline and Baker Botts as Transaction Advisors to the Government Negotiation Team in talks with Equinor, Shell and ExxonMobil regarding the development of an LNG project. The project involves development and construction of an onshore LNG plant to process and liquify natural gas from significant offshore natural gas discoveries in Tanzania and to export liquified natural gas to international markets. The main objective is to come to an agreement and execute an HGA (host government agreement) with the investors.

## Joint Venture Exploration Support, Tanzania

GaffneyCline provided assistance with technical decision making to a member of an E&P JV at the end of an offshore exploration phase. Decisions included the selection of relinquishment areas, prioritization of forward exploration programs, giving support at TCMs and strengthening the client's in-house technical capabilities.





# Our Experience

## Gas Reserves Audit, Tanzania

For a medium sized independent oil company, GaffneyCline undertook an audit of the recoverable gas volumes associated with a Tanzanian gas field. The audit was commissioned to provide comfort to potential gas buyers and to give the field operator recognition for its uncontracted gas volumes.

## Prospective Resources, Kenya/Tanzania

For a private client, GaffneyCline prepared an independent evaluation of two properties in Kenya (in the eastern branch of the EARS) and in central Tanzania. GaffneyCline's report included an independent assessment of the Prospective Resources attributable to these two properties.

## Project Oil Kenya Audit

GaffneyCline was engaged by Africa Oil to audit the completely redesigned development plan for Project Oil Kenya in Blocks 10BB and 13T to ensure it is technically, commercially and environmentally robust. The draft FDP, prepared by Africa Oil and its JV Partners Tullow and TotalEnergies, which allows for a higher oil production plateau and significantly greater expected gross oil recovery over the life of the field, was submitted to the Government of Kenya in late 2021. GaffneyCline reported independently verified Contingent Resources and related NPV10 in accordance with COGEH definitions and NI 51-101 Standards of Disclosure.

## CPR Preparation, Kenya

GaffneyCline prepared a CPR for a company with diverse petroleum assets, including in Kenya.

## Kenya and Ethiopia Resources

For an Africa focused upstream company, GaffneyCline provided Contingent and Prospective Resource evaluations over a number of years and for multiple non-operated blocks in Kenya and Ethiopia.

## Exploration Review, Kenya, Tanzania & Zambia

This study involved evaluation of a number of exploration licences and included making comparisons to the Albertine and Lokichar Basins. The potential of the Karoo rift system was also examined.

## Mozambique – Deepwater Gas Field Development Plans

On behalf of MIREME (Ministry of Mineral Resources and Energy – Mozambique) GaffneyCline undertook two separate reviews of the FDPs of deep water gas fields in two blocks in the Rovuma Basin to determine if the FDPs provided the best solutions. GaffneyCline reviewed the strategy and the development models, geological and reservoir engineering aspects, projected production schedules including an evaluation of the impact of connections of existing or planned facilities and fields, subsea systems (gathering systems plus trunk pipelines, etc.). The reports also presented associated project economics and monetisation considerations.

## Mozambique Rovuma LNG

GaffneyCline advised on the feasibility of an LNG export project in Mozambique. This included assessment of the feasibility of both domestic utilisation of gas and international marketing of LNG from the project and covering key aspects such as:

- Economic and commercial evaluation: LNG Market Analysis and Industry Trends, Domestic Regional and International Gas Supply/Demand, Domestic Gas Market Obligations, LNG Revenue Review, CAPEX and OPEX, Fiscal Regime, Ownership and Business Structure, Capital Structure, Annual Financial Statements, Project Competitiveness, Project Economics.
- Technical evaluation: Upstream production and midstream Plant technology selection, Production of feedgas from straddling and non-straddling structure, Concept of drilling and completion and subsea facilities, Appropriateness and configuration of facilities selection, Appropriateness of liquefaction process selection, Appropriateness of Site Selection, Schedule and EPC Contracting, EPC cost reasonableness compared to other projects.
- Risk Evaluation: Risk Register – Project Risk Analysis and Countermeasure Plan, Project Environment Analysis in Host Country, Market/ Finance, Currency and Foreign Exchange Risk, Contracts, Project Partners, Technology, Review of LNG affiliate marketing strategy.

## Field Development Advice, Mozambique

GaffneyCline was requested by an integrated energy company to review options for sustaining gas production from two fields to meet a specified plateau production rate. Gas In Place was validated, and different scenarios and well counts modelled to meet the sales contracts.

## Open-Acreage Dataroom Support, Mozambique

GaffneyCline representatives advised and supported client personnel through a two day, workstation-based data room in Mozambique. Following the dataroom GaffneyCline prepared a Prospectivity Report, including analogues, for the client.



## Our Experience

### Exploration Evaluation, Mozambique Channel

GaffneyCline evaluated two frontier deep water exploration blocks of the Mozambique channel and provided the Operator with recommendations for an ongoing work programme and possible farm-out.

### GIIP and Reserves Estimation, Onshore Mozambique

GaffneyCline used an extensive well and seismic database in conjunction with dynamic data in order to estimate Gas In Place and Reserves for onshore gas fields.

### Unitisation

GaffneyCline has undertaken unitisation and redetermination studies on behalf of clients around the world, including in East Africa.

### Advice on Exploration PSA Terms, Malawi

GaffneyCline advised a company looking to enter into Exploration and Production Sharing Agreements within Malawi. The company was seeking clarification on PSA agreements in such a new hydrocarbon industry in the country.

### Play Concept Development, Offshore East Africa

GaffneyCline undertook geological and geophysical evaluation for an Independent company with exploration licences. Play concepts were presented at client workshops.

### Expert Witness, East Africa

GaffneyCline personnel acted as Expert Witness in a dispute regarding exploration in a deepwater fold and thrust belt.

### Gas Resources Evaluation, Ethiopia

Gas discoveries and prospects in the Ogaden Basin were evaluated for a company looking to acquire a number of discoveries and prospects in Ethiopia.

### Gas Monetization Study, Ethiopia

GaffneyCline evaluated a number of options including power generation, gas-to-liquids, LNG, fertilisers, CNG or long distance pipeline for relatively remote gas discoveries where local demand was low. Analysis was done for both existing individual discoveries, and for a cluster of potential discoveries.

### Zanzibar Tanzania Commercialisation and Regulatory Capacity Building

GaffneyCline reviewed the fiscal terms on behalf of an interested party in order to enable the exploration and potential development of natural gas resources. GaffneyCline also evaluated local and regional demand, as well as LNG export and LNG import potential, gas to power economics and feasibility.

### Zanzibar – Peer Review

GaffneyCline participated in a technical peer review of the client's Prospective Resource gas estimates for a frontier exploration block offshore Zanzibar. The final deliverable was a presentation style report summarising the findings and results of the review, including recommendations.

# Gaffney Cline

For more information about GaffneyCline's integrated services, please contact your regional GaffneyCline office.

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