

Gaffney  
Cline

Experts in Brazil



## GaffneyCline

GaffneyCline is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector since 1962. GaffneyCline is well known as one of the leading suppliers of Reserves and Resources assessments, which are required for many purposes including statutory reporting, stock exchange listing, development planning, project finance, and asset valuation. In addition, GaffneyCline offers a full range of upstream, midstream and downstream consultancy services. These include seismic interpretation, static and dynamic reservoir modeling, field development planning, facilities and pipeline engineering, gas monetization, LNG/GTL, mergers and acquisitions, economics and project finance, unitization and redetermination, and expert witness work. GaffneyCline operates worldwide from three main offices in London, Houston and Singapore, supported by regional offices in Buenos Aires, Sydney and Dubai.

## Brazil

GaffneyCline has successfully completed over 80 projects in Brazil, from reserves audits to due diligence, spanning the entire spectrum of the oil and gas industry, from upstream to downstream, and including energy strategy and portfolio management advice. The list of GaffneyCline's clients is equally diverse and ranges from small independent E&P companies to major and independent oil companies, national oil companies, government ministries and lending/investment institutions.

To keep our clients ahead in the highly competitive energy business, GaffneyCline has also carried out various multi-client strategy studies and engaged in such varied activities as developing licensing rounds for petroleum exploration and development, marketing stranded gas resources and assessing the impact of changes in petroleum legislation.

To illustrate GaffneyCline's wide experience and expertise in Brazil a selection of projects is given below.

### Independent Evaluation

On behalf of the Brazilian national regulator ANP, GaffneyCline conducted an independent evaluation of the potential hydrocarbon volumes in the pre-salt reservoir in ten offshore exploration blocks. This valuation was used as the basis for the Cessão Onerosa negotiation between Petrobras and the Government of Brazil, by which exploration acreage was granted to Petrobras in return for stock in the company.

### Dataroom Farm-in Evaluation

GaffneyCline was requested to review data from a farm-out block. The farminee engaged GaffneyCline to provide an independent opinion as to the likelihood for successful exploration on the block. The value to GaffneyCline's client in this farm-in opportunity depended on the chance of drilling a successful exploration well and proving sufficient gas to co-develop along with the existing two accumulations to make a commercial supply of gas.

### Independent Evaluation for the ANP

GaffneyCline undertook an evaluation of the six pre-salt fields awarded to Petrobras during the Cessão Onerosa. GaffneyCline's evaluation included developing the static and dynamic models, evaluating different field development plans, simulations and production forecasts. GaffneyCline also evaluated the project costs (CAPEX, OPEX) to perform an economic evaluation. These evaluations were used by ANP to negotiate with Petrobras the proposed development plan of the Pre-Salt fields awarded to them during the Cessão Onerosa.

### Valuation of a Small Independent Brazilian Company

GaffneyCline conducted a valuation of a small independent Brazilian company for the launching of an Initial Public Offering (IPO) in the Bovespa Stock Exchange. The client has gone on to become the most important Brazilian independent publically listed E&P company.

### Reserves and Resources Evaluation

During a bidding process for an International NOC, GaffneyCline provided an evaluation of major pre- and post-salt blocks, offshore Brazil. This project included the interpretation of the seismic data, estimation of hydrocarbons initially in place (HIIP) and calculation of the related recoverable resources. Further the GaffneyCline team evaluated development plans, production forecasts, CAPEX and OPEX costs, cashflows, and NPVs.

### Reserves and Resources Evaluation

GaffneyCline conducted an evaluation of a gas development project, onshore Brazil. This project included both upstream, midstream and downstream elements. The upstream involved estimation of Gas Initially In Place (GIIP), recovery factors, auditing the reservoir dynamic simulation model, development plan, production forecasts. On the midstream and downstream sides, GaffneyCline also reviewed the electricity market evaluation, Gas Sales Agreement, gas treatment facilities and power generation facilities, and overall economic evaluation. This project today is a successful, vertically integrated, gas production-power generation project.

## Reserves and Resources Evaluation

GaffneyCline conducted the reserves and resources evaluation of numerous fields and blocks offshore Brazil. GaffneyCline has evaluated, in different bidding processes, numerous offshore fields that were offered to private companies, including the Carcara pre-salt field, and the Atlanta field.

## Reserves and Resources Audit

GaffneyCline has conducted the reserves and resources audit of clients' assets in Brazil, including the BAS-131 fields in Camamu-Almada basin; Cavalo Marinho, Caravela Sul, Estrela do Mar and Sardinha fields in the Santos basin.

## Resources Audit

GaffneyCline has audited the reserves and resources of several fields where a client has a participating interest. This was in relation to a dispute between GaffneyCline's client and another party involved in the development of the asset.

## Reserves Evaluation of the Atlanta Field

The main characteristic of the Atlanta field is that it is a heavy oil offshore development that will be produced with electric submersible pumps. On behalf of the operating consortium of the Atlanta field, GaffneyCline evaluated the reserves and resources at different stages of the development for the operator of the field. At present, the field is under a long-term test.

## Assessed the Potential Future Growth of Natural Gas Demand

Focusing on southeast Brazil, GaffneyCline reviewed the natural gas demand and how it may evolve, and various ways to meet it, including use of domestically produced gas and considering competition from possible gas imports into Brazil.

## Reserves Audit and Economic Evaluations

GaffneyCline has assessed several farm-in opportunities on behalf of domestic and international E&P companies both onshore and offshore, and including both pre-salt and post-salt reservoirs.

## Resources Evaluation

For a small independent E&P company, GaffneyCline conducted an evaluation for four exploration blocks offshore Brazil, in the Campos and Santos basins. These blocks included pre-salt and post-salt reservoirs.

## Reserves and Resources Audit

During the last seven years, GaffneyCline has been auditing the reserves and resources of a very large gas producing and power generation project in the Parnaíba basin. All the gas production is consumed by the power generating turbines of this private-owned vertically integrated company.

## Reserves Audit and Feasibility Study

GaffneyCline conducted a reserves audit and feasibility study in connection with the farm-in to, and financing of, an ongoing oil and gas field development program.

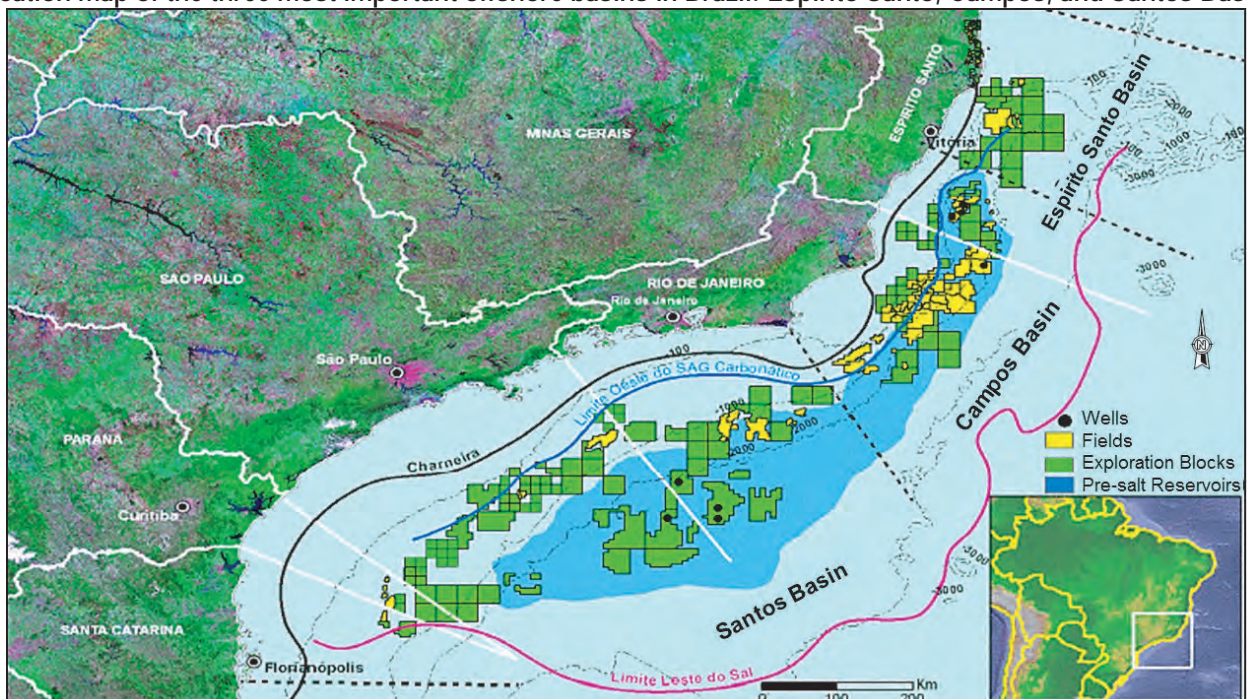
## Resources Audit

GaffneyCline has been conducting the reserves audit of an offshore gas producing field for a client. GaffneyCline has undertaken this audit annually for this client for the last eight years.

## Gas Utilization and Commerciality

GaffneyCline has undertaken a significant study of the gas market in Brazil, including related field development cost estimates.

Location map of the three most important offshore basins in Brazil: Espirito Santo, Campos, and Santos Basins



Source: ANP

## Provision of Regulatory Advice on Field Unitization & Redetermination

GaffneyCline, in conjunction with a top international legal firm with a subsidiary in Brazil, has been assisting Petrobras, IBP, PPSA, ANP and the Energy Minister on how to establish and conduct field unitization and redetermination processes for those fields, which straddle across block boundaries. Specifically, GaffneyCline has been advising on steps that should be taken to ensure unitization is expedited and occurs efficiently. The authorities recognize that the absence of an agreed framework for unitization cases has been detrimental to the country's oil sector, delaying development of major pre-salt blocks in Brazil.

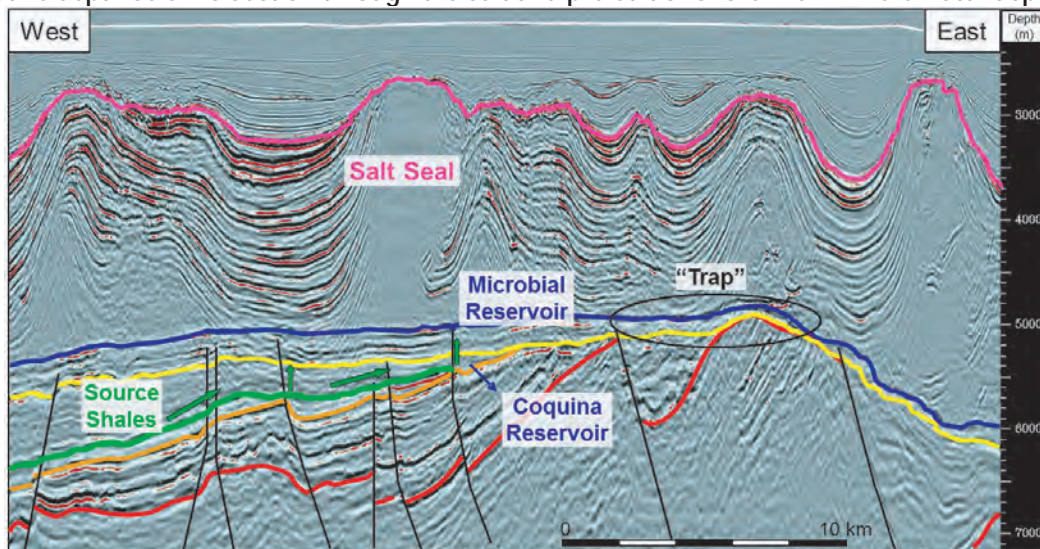
## Gas Commercialization Study

For a major international E&P Company in Brazil, GaffneyCline conducted a study involving assessment of the gas market today in Brazil and future development based on the availability of new sources of gas for domestic, industry and power generation. This major E&P company is planning to develop a large oil and gas field offshore Brazil and needed to identify and evaluate the various options to commercialize the gas to be produced.

## LNG - Power Generation Project

GaffneyCline was engaged by a large power generating company in Brazil to assist them on the development of an integrated LNG-power generation project. Companies in Brazil are seeking alternatives to generate power at a reasonable cost. Today, this type of vertically integrated projects can be a valid option.

Representative depth seismic section through the salt and pre-salt offshore Brazil where water depth c. 2,000m



Source: ANP

## Additional Information

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

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