

Gaffney  
Cline

India 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 range from 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, Sydney and Moscow.

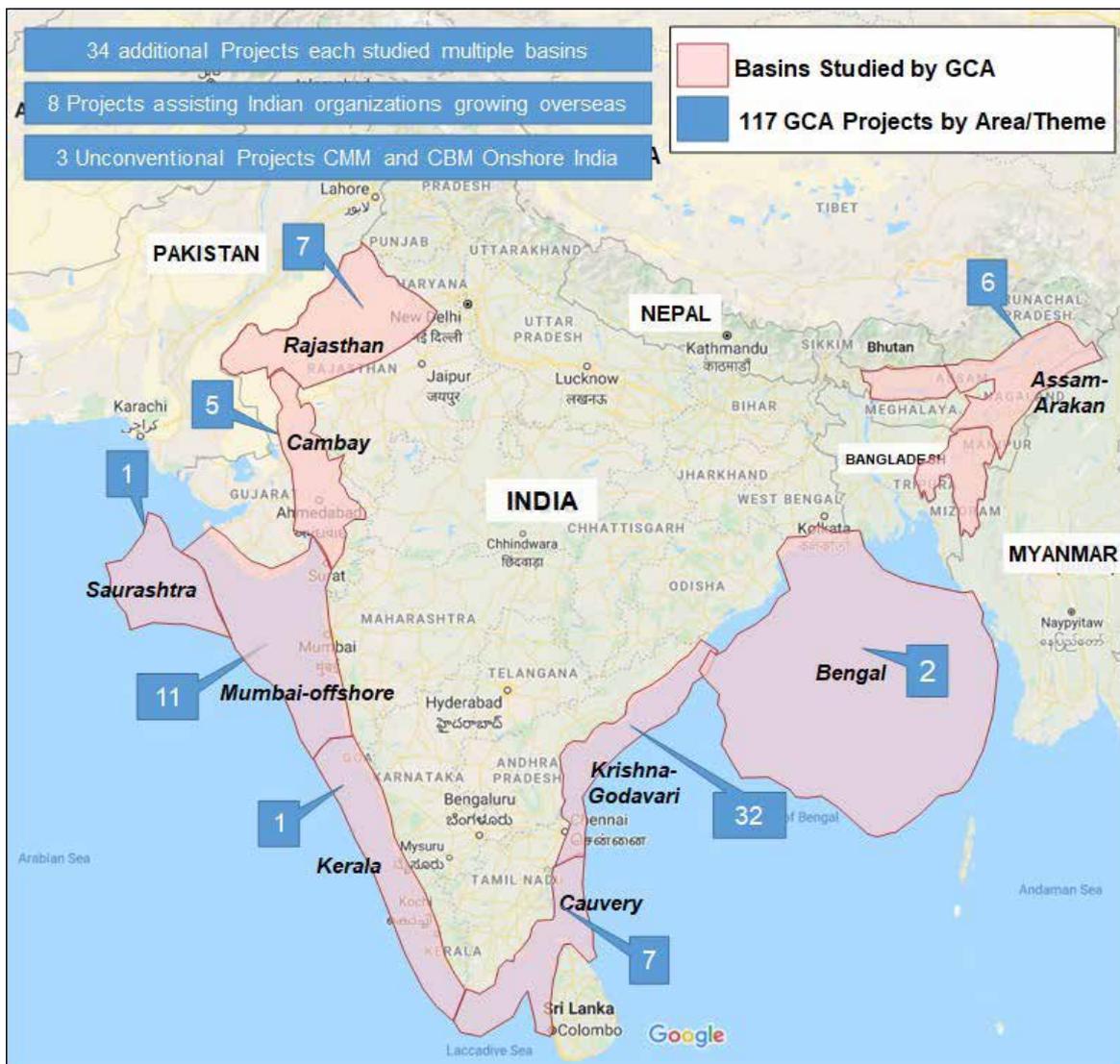
# India

GaffneyCline has undertaken, and continues to undertake, a wide range of projects in India over a period of more than 30 years serving a wide range of local and international clients from oil and gas companies to national oil companies, banks, service companies and international financial organisations. The scope of these projects has been very diverse including upstream exploration portfolio management and bid round support, technical field and development studies, gas and refinery market

studies, corporate strategy, legal dispute advice and a number of Reserve and Resource audits/evaluations and Competent Person Reports (CPR).

In addition, GaffneyCline has supported Indian organisations growing overseas.

The following pages provide a sample of the breadth of work that GaffneyCline has been engaged on in India.



# Our Experience

## Discovered Small Field Bid Round 2016

For an Indian Operator, GaffneyCline provided technical and commercial evaluation of 10 Indian fields. Support was provided in-country and concluded with a shortlist of technically and commercially NPV positive fields with reduced subsurface risk for potential bid submission.

## Offshore Gas Resource Assessment

GaffneyCline was engaged by a leading Indian oil company to provide an assessment of the gas-in-place and recoverable resources associated with the exploration results offshore in the Bay of Bengal. GaffneyCline performed detailed petrophysical interpretations generated independent 2D models of the channelised reservoir bodies and ranked in excess of 100 untested seismic anomalies.

## Resource Assessment

GaffneyCline undertook an evaluation of the Prospective Resources in an offshore Block for the Operator. This work investigated multiple prospects and leads within proven and possible plays in the Basin. The work combined an audit of the data and analysis provided by the client, but also involved GaffneyCline undertaking independent seismic analysis and volumetric assessment and estimation of Geological Chance of Success for the prospects and leads. Much of the Block was covered by 3D seismic data, which allowed seismic attributes to be used in the evaluation of reservoir quality and fluid content where appropriate. Deeper prospects and leads were evaluated using geological principles.

## Resource Assessment Offshore Gas Discovery, India

GaffneyCline was engaged by a large Indian oil company to develop static and dynamic reservoir models for a deep-water gas condensate discovery, offshore India. GaffneyCline conducted its own 3D seismic interpretation and analysis of log, well test and PVT data to construct static and dynamic models. Two technically attractive development options were identified and recommendations for appraisal made.

## Assessment of Indian Energy Market

For a major Middle Eastern National Oil Company, GaffneyCline carried out a detailed evaluation of the Indian energy and gas markets. Gas supply, demand, imports and prices were determined for a 20-year period. Pipeline import economics were derived and competing fuel economics assessed.

## Review of Geophysical Work

For a major State Indian oil company, GaffneyCline undertook a complete block prospectivity and prospect evaluation for an offshore block in the Krishna-Godavari basin. This involved detailed basin analysis of the block, identification of major depositional sequences, play fairway analysis. An exploration program and strategy were developed.

## Well Design in Indian Oil Field

For a major Indian Operator, GaffneyCline advised on well design in a field with high H<sub>2</sub>S and CO<sub>2</sub> concentrations. The work addressed well design, operational and safety procedures, and ways in which the design could be simplified to achieve cost savings.

## Technical Due Diligence for Corporate Acquisition

For a major Asian national oil company, GaffneyCline performed the technical due diligence and valuation of a portfolio of significant oil and gas fields in support of a large corporate acquisition. In addition, GaffneyCline provided advice on negotiating positions to adopt in discussions with the seller.

GaffneyCline India Projects	
Job Category	Number of Jobs
Reserves/Resources	44
Field Development/Technical Studies	20
Block/Asset Review	16
CPR	10
Acquisition & Corporate Strategy	8
Gas & Refinery Studies	4
Bid Round Support	3
Unconventionals (CBM)	3
Arbitrations & Dispute Advice	2
Other	7
<b>Total</b>	<b>117</b>



## Our Experience

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### Mumbai High Field Redevelopment

GaffneyCline was retained by the board of the Indian Oil and Natural Gas Commission (ONGC) for over 15 years to provide assistance with the operation and management of the giant Mumbai High field offshore western India. GaffneyCline specialists spent most of the time on the ground in ONGC's offices working with their staff on a broad range of technical, operational and management issues. GaffneyCline's approach was to use multi-disciplined teams covering all aspects of field management from seismic, geology, petrophysics, reservoir engineering and simulation to drilling, well bore technology, pipeline networks, facilities, cost reduction and economics. GaffneyCline was additionally mandated to report regularly and directly to the ONGC board on matters of long term Mumbai High reservoir management, the implementation of new technologies, the introduction of an ongoing development plan and benchmarking management, organisational and technical procedures against international norms.

### Refinery Financial Feasibility Study

GaffneyCline was requested by an Asian financial institution to conduct an economic feasibility assessment of a planned crude oil refinery in the Indian sub-continent. GaffneyCline's evaluation comprised the development of capital cost estimations, a review of the likely demand for refined products within the target region for supply, financial feasibility assessment and a sensitivity analysis.

### Upstream Asset Assessment, India

For a major Indian operator, GaffneyCline undertook an independent assessment of a number of upstream assets as preparation for the submission of the client's tender for their licence round.

### CPR for LSE Listing of Hardy Oil and Gas

GaffneyCline provided a Competent Person's Report to assist Hardy during its listing on the London Stock Exchange.

### Annual Reserves Audit

For a international operator, GaffneyCline undertook an independent reserve evaluation of its working interest in a gas field offshore India. Reserves were evaluated to COGEH guidelines for the client's annual filing to the TSX.

### Overseas New Country Entry

For a large Indian oil company, GaffneyCline evaluated the commerciality of Prospective Resources for two blocks highgraded as a possible basis for New Country Entry as part of the Ugandan First Licensing round. This involved a techno-economic assessment of the exploration potential, a range of development scenarios and offtake solutions for hydrocarbons in Uganda. A review of the PSC was also undertaken.

### Resource Assessment

GaffneyCline conducted an assessment of Contingent and Prospective Resources for Blocks in offshore India. The assessment of the resource potential was made in a play context with each play comprising the Operator's identified prospects and leads, plus a number of postulated prospects based on the play potential and its field size distribution. Volumetric estimates were made at both the prospect and play level.

### Review of Possible New Field Development, Offshore India

For an international investor, GaffneyCline undertook an independent due-diligence assessment of an undeveloped discovery offshore southeast India.

### Resource Assessment

For a London-listed independent oil company, GaffneyCline prepared an assessment of its resources offshore India. GaffneyCline assigned both Contingent and Prospective Resources to discoveries and prospects on the block respectively.



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

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