



Experts in Mexico

**Gaffney,
Cline &
Associates**

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Gaffney, Cline & Associates (GCA) is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector since 1962. GCA 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, GCA offers a full range of upstream, midstream and downstream consultancy services. These include seismic interpretation, static and dynamic reservoir modelling, 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. GCA operates worldwide from three main offices in London, Houston and Singapore, supported by regional offices in Buenos Aires, Sydney and elsewhere.

Mexico

Mexico's ambitious program to attract foreign investment into the oil and gas sector has been underway for some time. Round One had 39 blocks awarded out of 55 total blocks offered. Round Two resulted in 50 of 68 blocks being awarded, including 19 deepwater blocks in Round 2.4. Round 3 got off to a good start with 16 of 35 onshore blocks being awarded. The Pemex Associations or "Farmouts" have also attracted attention with three (3) contracts being signed between Pemex and International E&P companies looking to jointly invest and develop the fields. While other licensing rounds and farmout rounds have been postponed or delayed, the fact remains that a new ecosystem of operators, regulators, service companies, and private equity has sprung up and taken root in Mexico.

GCA has performed numerous projects in Mexico, some of which are outlined in the following brief descriptions.

Due Diligence for the Divestiture of an Exploration Portfolio in the Shallow Water Sureste Basin.

Following the Zama discovery in Mexico, GCA performed a techno-economic due diligence of several opportunities - offshore Mexico:

- Reviewed geological and petrophysical interpretations.
- Validated and Carried out Volumetric Hydrocarbon in Place
- Estimates for discovered accumulations.
- Carried out Volumetric Hydrocarbon in Place and Geological Chance of Success Estimates and ranked a large number of exploration opportunities.
- Provided Production Forecasts for each key opportunity.
- Carried out Economic Analysis and run Sensitivities depending on Various Price and Cost Scenarios.
- Provided Bidding Considerations.
- Visited the sellers data room.

Oil Monetization Project. For a new independent operator about to enter into negotiation with a crude oil purchaser, GCA determined the relative price for the crude in relation to other crudes in Mexico of similar quality such as Isthmus and Olmeca and to international crude markers such as Brent and WTI. GCA analysis focused on a comparison of yields of the subject crude with the other reference markers.

Review of Ayin-Batsil Farmout Opportunity. GCA assisted a Mexican operator in the review of a farmout opportunity for the Ayin-Batsil field in the shallow water offshore area of Mexico. The operator was concerned about the testing and appraisal plan that would be required to sufficiently de-risk the project. The costs associated with the appraisal program needed to be well understood as the fiscal terms of the project were quite challenging. GCA performed its analysis and the client decided to pass on the project. GCA analysis was further confirmed when the block was retracted and removed from the bid round due to lack of industry interest.

Assist in the Evaluation and Bidding of a Burgos Basin

asset in Mexico for a large E&P company, to facilitate the development of resources, infrastructure and their maintenance, establishing screening criteria for the blocks and recommendations, prioritizing the opportunities.

Assist in the Evaluation of Mexico's 2015 Round 1.3 Onshore Bidding Round.

GCA's client hired GCA to oversee its entire evaluation workflow for the bid round. This included:

- Pre-Screening Blocks
- Original Interpretation of Seismic
- Review and Validation of Estimates of Reserves
- Development of Mexico Economic Model

GCA worked with our client to develop commercial bidding strategies designed to make an informed decisions regarding appropriate bids for the selected blocks.

Independent Review of Reserves and Resources for Mexico's 2015 Round 1.3 Onshore Bidding Round.

GCA was tasked to review 6 blocks being evaluated by a newly formed Mexican E&P company. Our approach was to validate the interpretations used by the clients technical team and apply our knowledge and experience in the prospective areas. In areas where significant differences appeared, we looked to resolves these issues using a structured process. This process identified the key uncertainties underlying the assumptions and interpretation enabling the client's technical team to expand their understanding of the asset. The client was successful in becoming pre-qualified and placed several bids in the Round 1.3. While unsuccessful in winning any of the blocks, the client was very satisfied with the work performed by GCA and this lead to further work being contracted for later rounds.

Evaluation of Pemex Bid Package of Santuario Assets. GCA's client was planning to participate in Pemex's 2011 licensing round. This first round, under Mexico's new contractual regime (Integrated E&P Contracts), included licenses for the Santuario, Carrizo and Magallanes Blocks in the Chiapas-Tabasco region. Each license contained approximately six mature fields.

GCA was engaged to conduct a technical evaluation of the Santuario block in the Chiapas-Tabasco region of Mexico to assist an international O&G company to prepare bids, including:

- Conducted a high-level review of all the wells in the assets, and categorized them based on their level of performance. GCA investigated why many of the wells were shut-in.
- Reviewed the status and current state of the facilities.
- Reviewed the current operational capacities and identified any operational problems that could be optimized to increase operational performance.
- Reviewed the operational costs and expenditures including maintenance of facilities, if they were available. Based on GCA's past experience and knowledge, GCA identified areas where operational cost savings could be applied.
- Provided a high level report on the present status of the infrastructure.

Identify and Rank Potential Supply Acquisition Strategies to assist a large US electric power company to identify and rank options for a power project in Mexico. GCA also identified (a) key contractual terms for any supply agreement as they would relate to expected operations of the power plant, (b) Mexican regulatory framework for gas and electricity dispatch and (c) any other power sales terms that the Client required. The scope of work included:

- Assessment of the risks and rewards associated with each strategy, through validation with various Texas market participants, South Texas producers and others.
- Pros and cons of purchasing gas at the border vs. upstream.
- Advice on gas quality specifications.
- Issues related to obtaining Department of Energy (DOE) gas export permits.
- Risk identification and mitigation.
- Recent trends in gas supply agreements in South Texas (such as players, long vs. short-term, basis for pricing, remarketing of unused gas, etc.).
- Key contractual terms for supply agreements and Mexico rules for gas and electricity dispatch, with negotiation support.

Provide an Overview of the Geology and Petroleum Industry of Mexico based on data available in the public domain, including:

Regional geology of Mexico with emphasis on its petroleum accumulations and major petroleum basins, including the following:

- Sureste
- Salina del Istmo
- Macuspana
- Tampico-Misantla
- Burgos
- Veracruz
- Sabinas
- Sierra de Chiapas
- Purisima-Iray
- Sebastian-Vizcaino

A summary of PEMEX including history, organizational structure (domestic and international), exploration and development, refining and petrochemicals, energy supply and demand, oil and gas markets, and finance and investments. Likely investment requirements, including secondary petrochemicals, water-flooding and secondary recovery, enhanced oil recovery (EOR), natural gas and non-associated gas.

Survey of the Geological and Operating Conditions in South Texas Gas Fields. An operating company was considering participating in Mexico's forthcoming "opening" of the Burgos Basin to produce non-associated natural gas. GCA provided a document (based on public domain information) that summarized the geological and operating conditions of certain South Texas gas fields to assist the client to decide whether to participate, and the parameters of such an investment.

Description of the Region's Geology:

- This included a description of the major plays (Vicksburg, Yegua, Frio, Wilcox, etc.) from publicly available information, including source rock, trap types, etc. and other reservoir parameters.

Operating Conditions:

- This included aspects related to the operation of the reservoirs (i.e. gas quality, processing and treatment needs, and well completion methods).

Economic Analysis:

- Economic parameters were provided for three "generic" fields, which were considered to be representative of the fields in the region. The analysis was done before taxes as a way to illustrate the ceiling return.



Reservoir Evaluation - Offshore IXTAL Field. Assisted the client in the evaluation of two blocks for PEMEX, including:

- Gathered all available information from PEMEX's AbkatunPol Chuc Asset to create the field database for the following areas:
 - Seismic
 - Stratigraphy-Sedimentology
 - Petrophysics
 - Geomechanics
 - Reservoir delineation and characterization
 - Production history
 - Drilling engineering and reports
 - Completion engineering and reports
 - Cementing
 - Stimulations
 - Artificial lift operations
 - Technical limit
 - Risk evaluations
- Development of a reliable database for the IXTAL and YAXCHE fields to help understand the following:
 - Dynamic behavior of the reservoir
 - Drive mechanisms
 - Rock-fluid interaction
 - Material balance and reservoir pressure response
- Production analysis
 - Water cut/GOR evolution
 - Well architecture
 - Completion programs
 - Historical drilling performance
- Reviewed the current structural geological model to determine the reservoir geometry, define the boundaries for stratigraphic control and to evaluate the extent of the hydrocarbon accumulation.

Additional Information

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

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Determine the Price of LNG Imports into the West Coast and Central regions of Mexico, and the impact on gas prices as a result of importing LNG, including:

- Forecast of the demand for natural gas, by sector in Mexico, natural gas prices and the pricing mechanism.
- Analysis of how LNG imports may change the flow of natural gas between regions of Mexico vs. the existing pipeline infrastructure.
- Strategy for supplying LNG to the West Coast of Mexico.

Reserves and Resources Assessments

GCA has extensive experience in conducting independent resources assessments utilizing SEC, SPE-PRMS, and COGEH definitions. Most of GCA's work is confidential and, therefore, it is not possible in many instances to name clients and specific field assessments.

In Mexico GCA has also conducted resources assessments in the following:

- Burgos Basin, including Comitas, Mision, Monclova, Monterrey, Reynosa Blocks and the Pimienta shale.
- Sabinas Basin, Pirineos Block.
- Tampico-Misantla Basin, Arenque, Atun, Ebano, Panuco, San Andres, Tierra Blanca Blocks.

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