

9<sup>th</sup> December 2021

Shareen Crosby  
Chief of Staff  
Office of Senator Natasha von Imhof

[Shareen.Crosby@akleg.gov](mailto:Shareen.Crosby@akleg.gov)

Dear Shareen,

We appreciated the opportunity to review the requirements for the upcoming sessions in January/February 2022 with you and Senator von Imhof. We propose a total budget of US\$180,000 for a scope of work as set forth below.

## 1 Economic Overview of Alaska's Upstream Operations and Developments

In this element of the work, we will model the Alaska primary operations/developments. The expected outputs are analyses of:

- Competitive/economic analysis of Alaska's oil industry:
  - A qualitative competitive assessment of Alaska's position as a resource owner based upon what other jurisdictions are doing around the world, including a comparative assessment of Government Take in different jurisdictions. The Government Take assessment will look at revenue differentiation between federal lands (i.e. National Petroleum Reserve) and State lands.
- How different oil price scenarios impact Alaska's competitiveness on the global oil market.
- Review of major fields to determine how delays will affect anticipated volume and State revenue, plus additional factors that may affect schedules for new fields being opened, thus affecting anticipated revenue for the State.
- In the event that an oil revenue tax bill is proposed, how the tax change may affect different "asset types" (i.e. mature onshore, appraisal and development, exploration etc.).

As we have discussed, a key issue will be the data we use. Since our call, we have checked available public domain data and our internal data resources and we see a way forward. To the extent available, we will use operator data to build the model or validate our assumptions, inputs and results. Operators tend to be very protective of their information and we will probably have to rely on public domain data to a significant extent. However, our assessment is that the public domain information will be of generally good quality and we will be able to bridge any deficiencies in the data. We expect that the result will be high quality analyses and results.

The budget for the economic overview work is estimated to be US\$100,000.

## 2 Review of Alaska Gas and LNG

In this element of the work, we will review Alaska Gas & LNG and provide our perspective on the potential and risks. This is a complex and interesting area and could very easily be a topic all of its own. However, in the context of the anticipated committee meetings, it will be only one part of a larger picture. We have developed a full scope covering the range of issues legislators may be interested in but divided and budgeted the scope in two parts in case you determine that the full scope is more than is needed at this time. In our view, Part 2 of the scope is interesting, useful but optional in light of the themes we discussed in our last call. Accordingly, it does not form part of our budget proposal.

### Part 1 Overview of Alaska Gas and LNG

- Review of latest Alaska Gas & LNG project status and plans:
  - Positioning considering global gas & LNG market dynamics and outlook.
  - Summary of future potential and risks.
- Competitive/economic analysis of Alaska LNG project:
  - Benchmarking against other major exporting countries (country level, not individual projects)
  - A side-by-side comparison against LNG Canada (14 MMtpa), which is a direct competitor to Alaska's LNG ambitions to Asia in terms of large-scale volumes.
  - Given potential production rate uncertainty, a review of the potential for small-scale Alaskan LNG exports, by contrasting against Woodfibre LNG (2.1 MMtpa) in British Columbia, Canada.
  - A high-level consideration of the feasibility of smaller scale exports direct from the North Slope.

Part 1 budget for Alaska Gas and LNG is estimated to be US\$30,000.

### Part 2 Markets, Energy Transition and Potential Decarbonization Opportunities

- Updated view of key Asian LNG demand centers in terms of volume, contractual trends, pricing levels and indexation to determine marketing strategy options.
- Gas and LNG's role in the energy transition, and the need to consider the carbon intensity of the gas/LNG across the value chain to the end consumer.
- High level assessment of more creative ideas beyond or combined with the LNG export option to engage with a move to a lower carbon world e.g.:

- Leveraging the CO<sub>2</sub> removal facility planned for the North Slope for the LNG project (US\$10bn cost) to underpin a wider carbon capture/storage concept.
- Low carbon solutions utilizing the CO<sub>2</sub> storage capacity of the Prudhoe Bay oil reservoir e.g. as part of a Hydrogen, or more likely Ammonia export vector.
- Oxyfuel based systems with Carbon Capture.

If we were to include Part 2, the estimated budget for the work would be US\$25,000.

### 3 The Impact of Energy Transition

A view on the impact of energy transition and how that may impact Alaska's oil industry and the development of Alaska's gas industry going forward. The proposed scope of work is as follows:

- Review the current status of energy transition and consider how energy transition may unfold over time taking into account:
  - Market based developments expected to happen as cost reductions make key technologies such as EV and renewables commercially viable and able to substitute traditional fossil fuels.
  - Near-term decisions that support adopted policies such as government initiated or supported investments in low carbon mobility, electric grid infrastructure, battery innovation and manufacturing, energy efficiency in buildings etc.
  - Long-term commitments and related policy by different countries relating to achieving net zero levels of emissions, considering among other things the timing, magnitude and level of uncertainty associated with the commitments made.
- Assess the potential impact of energy transition scenarios on Alaska's oil industry and the development of Alaska's gas industry taking account different emissions reduction scenarios and the 'price competitiveness of Alaska's oil and gas sector relative to other major producers.

The budget for the energy transition work is estimated to be US\$40,000.

### 4 Presentations and Support to Legislative Committees

We will be available to present to legislative committees in the late January/early February 2022 timeframe. For purposes of budgeting, we have assumed a single presenter, and a presentation to each of the House and Senate Resource Committee.

The time and budget for presentation, integrating work elements and project management is US\$10,000. We have assumed that the presentations and other interactions will be virtual. Should it become feasible to travel and you wish us to do so, we would need to amend our budget estimate accordingly.

We understand that the legislature reconvenes 18 January 2022 and that we should be ready to report/present shortly thereafter. Accordingly, we will focus on delivering a draft/preliminary report in the form of a PowerPoint presentation by 20 January 2022 with a view to obtaining your input and finalizing the same by 25 January 2022. The report will be sent to your office in the first instance and we will await your instructions before forwarding it on to others.

In respect of the budget estimates, we will only charge for actual time worked and we will promptly advise you if the budget needs adjustment. If you are comfortable with the proposed deliverable, timeline and budget, please send me a confirmation email. Of course, if you would like to discuss the work or budget, let me know and I would be pleased to call you.

GaffneyCline will use the following team for the work:

Name	Function within Engagement
Michael Cline	Director / Strategy and Commercial
Frederick Weltge	Economist / Senior Advisor
Mark Wilkie	Carbon Management Director
Nick Fulford	Head of Global Gas and LNG
Ryan Pereira	Senior Advisor / Global Gas and LNG
Devassy Varghese	Economist / Consultant

Attached in Appendix I are CVs of team members.

Please note that we will need to secure the resources for the work (i.e. people) over a period that is typically very busy for us and it would be good to hear from you soonest so that we can secure the necessary resources.

I look forward to talking with you.

Yours sincerely,

**Gaffney, Cline & Associates**



Mike Cline  
*Director – Strategy and Commercial*

## Appendices

Appendix I CV's of Key GaffneyCline Professionals

**Appendix I**  
**CV's of Key GaffneyCline Professionals**

## Michael B Cline

Michael is a Director at Gaffney, Cline & Associates Limited (GaffneyCline), an international consultancy with offices in the United Kingdom, North and South America and the Asia Pacific. GaffneyCline provides a broad range of technical, commercial and strategic advisory support to the private and public sectors of the oil and gas industry, as well as to financial institutions, law firms and multilateral organizations. Michael has over 30 years of experience providing advisory support to clients around the world, including advice to governments and private investors on legal and business issues associated with privatizations and foreign investment, cross-border activities, mergers and acquisitions, joint ventures and partnerships and strategic alliances and investments.

### Key Areas of Expertise

- Petroleum laws and regulations and regulatory organizations
- Petroleum contract development and negotiation support
- Structuring and support for licensing and other competitive bidding processes
- Oversight of integrated technical and commercial teams in complex petroleum projects

### Professional Experience

1999 – Present: **Director of Corporate Strategy** – Gaffney, Cline & Associates Limited

- A Director in the Corporate Strategy Group providing legal and business advice to governments, national oil companies, international oil companies, lenders and others on petroleum laws and regulations, contract development and negotiations, transactions and operations, legal compliance and corporate counseling.
- Experience includes:
  - Acting as lead advisor to Kuwait Petroleum Corporation and Kuwait Oil Company on the opening of Kuwait's upstream sector to participation by international oil and gas companies,
  - Providing legal and commercial advice to the Government of Iraq in connection with licensing tenders to engage international oil companies in the development of major oil and gas fields throughout Iraq,
  - Leading a multi-disciplinary technical and commercial team evaluating a major onshore heavy oil development in the Middle East as part of the stage gate development process,
  - Leading a multi-disciplinary technical and commercial team evaluating a large offshore oil development in connection with the development of technical and commercial proposals to the national oil company to further develop the field,
  - Working with ministries and regulators on the development of regulations and regulatory and administrative systems and organizations,
  - Analyzing and benchmarking operating cost structures and developing frameworks for cost savings initiatives, and
  - Advising legal and restructuring experts on development and valuation matters in the E&P bankruptcy/administration context.

Mar 1997 – 1999: **Deputy General Counsel** – AMRESKO, Inc.

- Deputy General Counsel for AMRESKO, INC., a publicly held financial services company with offices throughout the United States and in the United Kingdom, Canada, Mexico, Japan and Thailand.
- Reported to the Chairman of the Board and Chief Executive Officer and the Members of the Executive Committee on Corporate Governance matters and served on the Risk Management Committee.
- Responsible for:
  - Corporate and securities matters, including public offerings of equity and subordinated debt, securitizations and other asset-based financing transactions,

- Mergers and acquisitions associated with strategic programmes to build lines of business, including multiple acquisitions of commercial real estate and small business lending entities, and Securities compliance.

1985 – 1997: **Shareholder** – Winstead PC

- Shareholder in the Corporate Finance Group of a law firm with offices in Dallas, Houston, Austin, Washington D.C. and Mexico City. Engaged in a broad based corporate finance practice, including
  - Public and private offerings of equity and debt securities,
  - Mergers and acquisitions (including stock and asset transactions, mergers, exchange offers and tender offers),
  - Venture capital financings, and
  - Partnership, joint venture and licensing arrangements.

### Professional Societies

- Licensed to practice law in the State of Texas
- American Bar and Dallas Bar Associations
- Association of International Petroleum Negotiators

### Education

- 1981 B.S. Foreign Service, Georgetown University
- 1985 Juris Doctor, S. Methodist University School of Law

## Frederick Weltge

Leads the UK economics team and has ten years' experience advising clients on oil and gas asset valuations, upstream contracts, national petroleum regimes, and industry movements.

### Key Areas of Expertise

- Economic/Financial analysis and modelling of oil/gas assets
- National hydrocarbon fiscal regimes
- Upstream block contracting and licensing

### Professional Experience

2011 – Present: **Senior Commercial Consultant** – Gaffney, Cline & Associates Limited

- Performing economic and financial valuations for upstream and downstream assets
  - Completed numerous global oil and gas asset evaluations with experience in over 40 countries for projects involving due diligences, expert witness, competitive tenders, unitization, portfolio optimization, competent persons reports, and reserves reports
  - Written valuation reports for use in litigation, companies filing for public offerings and hostile takeovers of publicly listed companies
  - Conducted portfolio optimization and analysis for African and South American NOC
  - Evaluated operational losses for Force Majeure insurance claims in Libya, Egypt and Syria
  - Analysed field development and portfolio options to optimize value from client's asset base for small independents, particularly in Nigeria, US, Egypt, and Mexico
- Advising clients on upstream contracting, licensing and policy
  - Worked with numerous NOCs and governments on reassessing or renegotiating fiscal terms to stimulate activity since the change in market conditions in 2014
  - Supported and met with the Petroleum Contracts and Licensing Directorate of Iraq to advise on business structure, marketing, evaluation, and process of upstream licensing rounds, including audits of IOC comments and proposals brought forth in subsequent negotiations
  - Advised the Ministerio Coordinador de Sectores Estrategicos of Ecuador on major integrated upstream/downstream project's business structure, economic evaluation, and negotiations
  - Assessed strategies and options for clients bidding on competitively tendered oil and gas licenses
- Projecting industry movements to deliver client insights on market trends and implications
  - Advised clients on the contractual developments and opportunities of the Mexican Energy Reform
  - Analysed US unconventional activity by basin to forecast production and breakevens
  - Forecasted natural gas supply and consumption outlooks for multiple projects to determine potential for gas transportation, utilization and monetization investments
  - Identified investment opportunities in new conventional and unconventional plays
  - Evaluated gas monetization opportunities in Trinidad and Tobago, Kuwait and Iraq

2010: **Intern** – Gaffney, Cline & Associates

- Edited and created upstream petroleum contracts for client countries
- Supported projects with research and statistical analysis to determine future trends and economic feasibility
- Assisted with economic and financial modelling of client data



2009 – 2010: **Research Intern** – Prestige Economics

- Researched extensively the commodities market, specifically the metals and energy sectors
- Researched and presented how to start a commodities trading market for scrap metals
- Provided historical and statistical information to clients.

### Professional Societies

- Association of International Petroleum Negotiators
- Energy Institute – Young Professionals

### Education

- 2011 B.A. Economics, The University of Texas at Austin, Austin, Texas
- 2011 Minor Finance, The University of Texas at Austin, Austin, Texas

## Mark Wilkie

Mark recently joined GaffneyCline as Carbon Management Director for Europe, Middle East, Africa, Russia and the Caspian.

With over 19 years of technical and commercial experience in renewable energy with several major global players he has established a track record in leading; business strategy, planning, programmes and project investments in energy decarbonisation from renewable and clean energy sources.

Most recently Mark led the Renewable Energy Programme for Heineken targeting carbon neutrality across its global production and was previously Head of Project Development for the Renewable Energy Division of Saudi Aramco

### Key Areas of Expertise

- Carbon markets, policy and reporting
- Clean energy solutions
- Origination, development and financing of clean energy projects
- Structuring of renewable power offtake agreements and certification mechanisms
- Development of business strategy and planning
- Programme and Project Management

### Professional Experience

Sept 2021 – Present: **Carbon Management Director** – Gaffney Cline & Associates Limited

- Recently joined GaffneyCline to work on projects Worldwide.

Jul 18 – Aug 2021: **Global Renewable Energy Programme Manager** – Heineken, Amsterdam, Netherlands

- Lead an international multi-disciplinary programme team to reduce Heineken's global carbon emissions by 80% in Production by 2030.
- As Global Programme Manager I am responsible for shaping the strategy and established the programme organization, processes, governance and reporting. The Global Programme covers almost 200 production sites across 60 countries in the regions of; Europe, Africa Middle East, Asia Pacific and South America.
- In 2020 annual report we successfully reported a reduction of over 50% in carbon emissions in Production. Consequently the Programme has further developed the carbon reduction strategy and roadmap to target Carbon Neutrality by 2030 in Production and Carbon Neutrality across the full value chain by 2040. The revised strategy will leverage energy reduction, targeted carbon offsetting, fuel switching as well as replacement of conventional with renewable energy such solar, wind, geothermal, concentrated solar thermal, bio-methane and potentially hydrogen

Primary Responsibilities:

- Global insights into energy markets and carbon policy ·
- Development of corporate carbon reduction strategy through reduction, replacement and offset
- Oversight and evaluation of solutions to decarbonize heat and power ·
- Establishing technology and project roadmaps ·
- Establishing and oversight project pipeline from origination to investment decision ·
- Oversight of financial appraisal and preparation of investment proposals ·
- Stakeholder engagement and communication ·
- Preparation and presentation of investment case to the executive board ·
- Chairing programme steering committee
- Leading cross functional team (engineering, procurement, finance, corporate affairs and law)

Oct 2012 – Jul 2018: **Head of Renewable Energy, Project Development, Power Systems Renewables** – Saudi Aramco, Dhahran, Saudi Arabia

- Established the strategy and the organization for the origination, development of utility scale solar and wind projects across Saudi Arabia for Saudi Aramco and latterly on behalf of the Ministry of Energy, Industry & Mineral Resources.
- By 2016 Saudi Aramco's renewable project pipeline portfolio exceeded 3GW. The first two projects from the pipeline, totaling 700MW, were tendered in Round 1 of the National Renewable Energy Program, in February 2018 the first contract was awarded for a 300MW solar PV plant at record price of \$ 23.4/MWh and in July 2018 bids received for the second project a 400MW Wind farm from \$21.3/MWh

Primary Responsibilities:

- Driving strategy for the development of utility scale renewables .
- Establishing project portfolio and management of development risks .
- Leading project development organization .
- Lead structuring & negotiation PPA .
- Lead structuring & negotiation of agreements with project developers and investors . oversight on land acquisition .
- Lead negotiation on access to grid interconnection .
- Engagement of national agencies on development of energy policy .
- Oversight on environmental social impact assessment and permits .
- Preparation and presentation of investment case to executive committee .

Mar 2009 – Sept 2012: **Projects Director, Renewable Energy** – Platina Partners PPL, London, UK

- Initially appointed as Consultant and subsequently Projects Director for Private Equity fund manager Platina, with €500M equity under management. The fund specialized in the origination, acquisition and operation of renewable power projects in Europe through limited recourse project finance.
- Responsible for oversight of pipeline of utility scale renewable power projects during the development, acquisition, construction and operation in; Greece, Italy and Spain.
- In addition supported the formation of an International Power Producer, Eoxis Energy, in India, enabling Eoxis to bid for PPAs in first national and regional auctions for renewable energy and the acquisition of its first portfolio of Wind and Solar projects in India.

Primary Responsibilities:

- Identification and appraisal of investment opportunities to acquire projects
- Managing local project developers to establish new project pipeline
- Lead due diligence on project permits, consents and project agreements
- Supervision of lenders advisors and consultants
- Support preparation of project investment memorandum for investment committee
- Lead structuring and negotiation of project contracts and agreements

Mar 2004 – Feb 2009: **Business Development Director & Co-Founder** – Solar Green Ltd., Chelmsford, UK

- Co-founder and Director of Solar Green established in 2004 as specialist contractor in the design, supply, construction and servicing of Building Integrated; Solar Photovoltaic (BIPV) and Solar Thermal systems in the UK. Established Solar Green as a pioneer in the building integration of solar technology.
- 2006 selected as UK partner installer for Sharp Electronics, 2007 preferred contractor status with Balfour Kilpatrick and Laing O'Rourke, 2008 designed and constructed Solar Thermal Plant on British Land PLC development, building awarded Green Award 2008.

Primary Responsibility:

- Business start-up planning and strategy
- Market analysis and evaluation
- Business and market development in solar projects and after sales service
- Negotiation of supplier agreements
- Relationship management of key suppliers and contractors
- Preparation and presentation of customer proposals
- Identifying new business opportunities

- Establishing key accounts
- Sales and marketing strategy

Jan 2002 – Feb 2004: **Projects Team Manager** – BP Solar, Northern Europe, Sunbury, UK

- Lead the project team for BP Solar Northern Europe, to successfully deliver a portfolio of projects principally in the UK, Netherlands and Denmark.
- Team awarded Energy Globe in 2002 for contribution to low carbon development, 2003 completed the largest Solar PV projects in the; UK, Netherlands and Denmark, by 2004 BP Solar established leading market share in the UK.

Primary Responsibilities:

- Reporting and forecasting on project teams performance and budgets
- Coaching and development and management project managers and engineers
- Contract approval
- Oversee technology selection
- Manage selection and appointment of contractors
- Oversight on project budget and planning
- Preparation of customer proposals
- Market and business development
- Development of new products and services •□

Sept 2000 – Jan 2002: **eBusiness Strategy Consultant** – BI International, London, UK Mar

1998 – Aug 2000: **Commissioning Supervisor** – BP Chemicals, Hull, UK

Sept 1996 – Mar 1998: **Project Engineer** – BP Chemical, Hull, UK

Oct 1989 – Mar 1993: **Technical Apprentice** – Pilkington Glass, St. Asaph, UK

### Education

- 1996 BEng (Hons) Electrical & Electronic Engineering – University of Manchester Institute of Science and Technology (UMIST)
- 1994 University Scholarship – British Steel, UK
- 1993 HNC Process Measurement & Control – NEWI, Deeside, UK
- 1991 ONC Electrical & Electronic Engineering – Llandrillo Technical College, UK

### Industry Courses

- 2019 E2E Supply Chain Management – IMD, Switzerland
- 2018 Certified Expert in Climate Finance – Frankfurt School of Finance and Management, Germany
- 2014 Project Finance – International Faculty of Finance, UK

## Nick Fulford

Nick has over 35 years' experience in the gas industry covering major M&A transactions, LNG and gas marketing in Europe, Asia, Caribbean and North America. He has a proven record in the natural gas sector, working on all aspects of the gas value chain from complex upstream projects, through to wholesale and retail market management, regulatory policy and trading. Nick has first-hand experience of the evolution of the UK and European gas markets and the evolving gas and LNG policy in Asia and North America.

### Key Areas of Expertise

- Gas monetization, project structuring, markets and pricing
- Expert witness, gas and LNG price negotiations
- Unconventional natural gas resource exploitation
- International natural gas trading
- Wholesale and retail natural gas markets, regulatory governance and government policy

### Professional Experience

2013 – Present: **Global Head of Gas/LNG** – GaffneyCline, Houston

- Shapes strategies to assist clients successfully navigate growth in global natural gas and LNG
- Selected advisor for US Department of Energy on gas to power in Africa
- World Bank Jordan and Libya gas demand/supply and FSRU LNG import business cases
- Evaluate Rovuma LNG project for major investor, including project competitiveness, economics, pricing, LNG marketing arrangements
- Advice to project sponsor of LNG Canada on investment case leading up to FID, including project feasibility study covering upstream, midstream and downstream markets
- Advisory services to Cameroon NOC on feasibility of utilization of gas domestically and for LNG exports, gas monetization strategy, supply, demand, pricing, regulatory, economics
- Support Cypriot govt. agencies on LNG procurement for power generation / negotiation of SPA/TUA
- Iraq gas market design, regulatory framework and power plan for government legislation
- Argentina shale oil and gas monetization study and acquisition entry strategy
- Gas monetization strategy in Indonesia for PSC gas discovery, commercial and strategic
- Evaluate African gas to power projects: Ivory Coast, Nigeria, Mauritania, Senegal and Mozambique
- Commercial and technical advice regarding Eastern Mediterranean gas development
- Alaska LNG project, commercial, property tax, economic modeling, project structuring
- East African LNG monetization, economics, due diligence, commercial guidance
- Provide World Bank Cameroon gas monetization and power market analysis
- Advice on Australian gas import project, commercial, pricing and FSRU/onshore economics
- Advice on commercial, regulatory and technical aspects, regarding Pakistan gas import project
- Thailand domestic and global gas market study and recommendations for Market Reform
- Japanese Energy Market Reform, LNG trading
- Australia LNG markets, transfer pricing, global supply and demand analysis, key Australian LNG projects commercial and breakeven analysis, contract valuations
- North African (Algeria and Egypt) domestic and export gas supply and demand, LNG and pipeline contracting strategy
- East Mediterranean Gas Forum intergovernmental study on development options

1983 – 2013: **Various roles** – British Gas, Centrica and Direct Energy

- 2010-2013: **Strategic Advisor** – Centrica plc, Houston, Pittsburgh, Calgary
  - Led major growth initiative to determine attractiveness, commercial feasibility and deal structuring options for shale gas investments in North America
  - Worked with investment banks, legal counsel and consultants to maintain flow of investment worthy unconventional gas opportunities, and deal structuring possibilities
  - Briefed Executive Management and board sub-committees on aspects of shale gas development including economics, safety/environment and corporate social responsibility
- 2006-2010: **Director, International Business Development** – Centrica plc, Windsor UK
  - Led upstream gas exploration/development and LNG projects in Egypt and Qatar and other initiatives in Norway (country entry), Oman, and Trinidad
- 2000-2006: **Senior Vice President** – Direct Energy, Toronto/Calgary, Canada
  - Developed / executed North American entry strategy; led \$900m acquisition of Direct Energy
- 1998-2000: **Director, Strategy and Development** – Centrica Energy Management Group
  - Negotiated acquisition of key upstream assets/companies including PowerGen North Sea
- 1995-1998: **Assistant to Chief Executive, Sir Roy Gardner**
  - Led Centrica in demerger of British Gas plc and advised CEO/Board on process/strategy
  - Re-negotiated long-term take or pay gas purchase contracts, part of US\$2bn restructuring
- 1983-1995: **Various roles** – British Gas plc
  - 1992-1995: **Project Manager**, Global Gas
  - 1983-1992: **Project Engineer**, Gas Purchasing Department

1975 – 1983: **Engineering and Analysis** – UK Ministry of Defense

### Patents and Publications

- Various radio/TV interviews, including CTV, CBC, Global and Fox, including media training
- Contributes to press articles
- Participates in energy-related events and speaking engagements
- Consulting author:
  - "Liquefied Natural Gas, Law and Business of LNG" (3rd Ed.)
  - "Shale Gas, Practitioners Guide to Shale Gas & Other Unconventional Resources" (2nd Ed.)

### Professional Societies

- Chartered Engineer (CEng)
- Institution of Mechanical Engineers (MIMechE)
- Institution of Gas Engineers (MIGasE)

### Education

- 1981 MS Engineering, Royal Military College of Science, Shrivenham, Wilts, UK
- 1979 BS (*Honors*) Engineering Science, St. Chad's College, University of Durham

## Ryan Pereira

Ryan Pereira is Global Director in the global gas & LNG group at Gaffney Cline & Associates (GaffneyCline). A commercially focused energy industry professional based in London, Ryan has extensive international experience and cultural awareness having completed assignments across Europe, the Middle East, Africa, Asia Pacific, North America and the Caribbean across the downstream, chemicals, midstream and LNG, and upstream sectors. He holds a degree in economics and qualifications in management accounting, corporate finance and treasury, and project management.

Ryan has over 18 years of global experience in the energy sector, from industry and advisory roles with majors (ExxonMobil) and operators (Centrica Energy), as well as working with joint venture parties and national oil and gas companies.

Since joining GaffneyCline in 2014, Ryan has led projects covering LNG import and exports (including FSRU/FLNG), gas to power, M&A, gas disputes and arbitrations, gas monetisation and utilisation studies, gas and power energy market reform, delivery of LNG training and has authored several articles and book chapters for external publications covering global gas markets. Ryan has led the development of GaffneyCline's Global LNG Supply and Demand model and its implications for pricing going forward, and also leads GaffneyCline's global client outreach on Gas and LNG projects. Since 2018, has increasingly focused on gas' role in the energy transition including projects covering carbon management, regulatory reform, carbon neutrality and CCUS.

### Key Areas of Expertise

- Commercial, economics and finance leadership, regulatory policy and strategy
- LNG export and import projects, including onshore and offshore, FLNG and FSRUs
- Gas monetisation, LNG and shipping, sale and purchase agreements, gas sales, pricing
- Business development, M&A, economics, valuations and project delivery
- Experience across the energy value chain, including wind power, carbon management, CCUS and gas' role in the energy transition

### Professional Experience

Oct 2018 – Present: **Global Director – Gas & LNG** – Gaffney, Cline & Associates Limited

- Direct report to Global Head of Gas & LNG, responsible for expanding GaffneyCline's leading commercial and technical advisory position, interacting with clients and stakeholders at a senior management and executive level. Increasing involvement in Carbon Management.
- In this, and previous role, has initiated and managed mandates worldwide, including:

*LNG export and imports (including FLNG and FSRU):*

- Multi-year commercial-technical advisor to European power generator seeking first LNG imports. Advise on GSAs, SPAs, TUA, TCSA, EPCOM, financing, commercial terms, pricing, economics, global gas market analysis and technical aspects.
- Led global LNG importation and gas-to-power screening and investment strategy study for large Asian investor.
- Australia FSRU LNG pre-feasibility client commercial and technical advisory services.
- West Africa FSRU and LNG import technical and commercial advisory services, including small scale LNG options for investor looking at power generation.
- Assessment of Rovuma LNG project for a major investor, including project competitiveness, economics, pricing, LNG marketing arrangements.
- Advice to project sponsor of LNG Canada, on investment case leading up to FID, including project feasibility study covering upstream, midstream and downstream markets.

- World Bank Jordan gas demand/supply and FSRU LNG import business case.
- World Bank Libya gas demand/supply and FSRU LNG import business case.
- UK gas storage asset evaluation and linkage to wider gas and LNG trading strategies.
- Advisory services to Cameroon NOC on feasibility of utilisation of gas domestically and for LNG exports, gas monetisation strategy, supply, demand, pricing, regulatory, economics.
- South East Asian company LNG entry strategy including FSRU options, LNG procurement strategy, pricing, negotiations and LNG terminal, third party access structuring, organisation.
- Gas market supply, demand and pricing analysis regarding Egypt including FSRU imports.
- Alaska LNG project, commercial, property tax, economic modelling, project structuring, LNG marketing potential and financing.
- Commercial and technical advice regarding Eastern Mediterranean gas development and onshore and offshore gas import projects, including FSRU analysis.
- Commercial and technical advice to lender regarding Pakistan FSRU gas import project.
- Eastern Mediterranean LNG export potential for a government entity.
- Commercial advice regarding Australian gas import project and FSRU economics.
- East African LNG monetisation, economics, due diligence, commercial guidance.
- North African (Algeria and Egypt) domestic and export gas supply and demand, LNG and pipeline contracting strategy.

*Gas market and monetisation studies, including gas to power:*

- Led design, development and update of Proprietary Global LNG Supply Demand model.
- Project manager advising 7 Ministers of Eastern Mediterranean Gas Forum countries (Cyprus, Egypt, Greece, Israel, Italy, Jordan, Palestine Authority) on gas strategy.
- IFC Iraq gas market study supporting loan for expansion of gas, condensate and LPG facilities.
- East Africa gas monetisation study, strategy and Ministry engagement on behalf of Middle Eastern client. Included analysis of power markets and feedgas supply economics.
- UK West of Shetlands basin gas monetisation strategy, economics and development.
- Advising Cypriot government agency on LNG procurement and negotiation of SPA / TUA.
- Iraq gas market design, regulatory framework and power plan for government approvals.
- Argentina shale oil and gas monetisation study and acquisition entry strategy.
- Gas monetisation strategy in Indonesia for a PSC gas discovery, commercial and strategic.
- Evaluation of various African gas to power projects including Ivory Coast, Nigeria, Mauritania, Senegal and Mozambique.
- Cameroon gas monetisation and power market analysis support for World Bank.

*Expert witness, pricing, dispute, gas market reform and other commercial projects:*

- Midstream gas market reform and pricing support to Middle Eastern client
- Multi-year advisory services covering monthly analysis and recommendations to client regarding LNG exports, competitiveness, LNG imports, prices, volumes and market trends.
- CCUS technology and policy advisory services for Middle Eastern client domestically and internationally.
- Expert witness to a branch of the Australian government on LNG transfer pricing and pricing methodology, and determination of cost/benefit analysis of volume flexibility.
- Australia LNG markets, transfer pricing, global supply and demand analysis, key Australian LNG projects commercial and breakeven analysis, and contract valuations.
- Japanese Energy Market Reform, LNG trading.
- Thailand domestic and global gas market study and recommendations for Market Reform.
- ASEAN gas market studies.
- Eastern European oil and gas company acquisition due diligence support, project structuring, organisational design.
- Gas and LNG value chain 2 day training course preparation and delivery for client.

Sept 2014 – Sept 2018: **Principal Commercial Manager, Global Gas & LNG** – Gaffney, Cline & Associates



- Joined GaffneyCline to work on projects worldwide, with a focus on Global Gas & LNG and growing the Gas New Ventures practice.

2008 – Sept 2014: **Various see below** – Centrica plc.

April 2012 – Sept 2014, **Project Manager of Energy Projects / Innovation Facilitator**

- 4 month secondment in Canada leading 3 work streams (IS, Facilities and HSE) to integrate newly acquired US\$1bn gas assets. Scoping, Day 1/Day 100 plans, led and motivated teams, ensured milestones achieved.
- Working on a number of projects for key Centrica Energy Directors including Capital Excellence transformation programme, Upstream Business Performance Review, Hedging, £1.1bn wind-farm project, £2bn gas project. Planning, monitoring and economic modelling of Centrica's windfarm projects (LID, Barrow, Braes of Doune, Racebank).
- Selected as an Innovation Facilitator to plan, develop, present and execute various energy related projects.

Oct 2011 – Mar 2012: **Travelling, Centrica-approved 6 month sabbatical**

- Travelling around South America, South Africa and SE Asia for pleasure, education, fitness and voluntary work.

Mar 2010 – Sept 2011: **Head of International Finance (new country entry)**

- **Trinidad new country entry:** Managed the set-up of the new Trinidad LNG business as part of leadership team. Service provider and bank selection, company incorporations, director and tax registrations, recruitment.
- **Establishment, leadership, management and development:** of a team of 8 in Trinidad.
- **International Leadership team:** highlights include largest Trinidadian seismic survey, establishing Centrica as a recognised competent PSC operator in Trinidad, advancing commercialisation of gas discovery (c. 1.3tcf/£2bn).
- **Upstream Senior Finance Leadership team:** people development, strategic thinking, business presentations.
- **Relationship building:** with foreign Ministry, national gas companies, JV partners and local business partners.

Apr 2008 – Feb 2010: **Business Development Finance Manager**

- **Oil and gas acquisitions:** extensive involvement in over 16 acquisition cases. Preparation of valuation, financial analysis, key risks and sensitivities, deal structure and input into Board papers. Managed relationships with Technical Subsurface, Business Development, Technical Accounting, Tax, Legal and Treasury colleagues.
- **Successful acquisitions completed:** US\$380m LNG PSC gas asset acquisition in Trinidad (2010). £1.3bn takeover of Venture Production (2009). US\$30m acquisition of share in gas development licence (2008).
- **Integration planning and execution:** preparing and implementing the Venture Production integration plan, supervision of Venture employees to ensure smooth integration into existing Centrica formats and timelines.
- **Process improvements:** development of a detailed automated acquisition process including commercial and technical checks, resulting in quicker turnaround of business cases and ensuring robust valuations were made.
- **Senior management influence:** frequent ad-hoc preparation and presentation of high-level analysis to Centrica Energy Finance Director. Simplification of complex information facilitated Board level strategic decision-making and introduction of capital allocation analysis determined ranking of development and exploration projects.

2003 – 2008: **Various see below** – ExxonMobil

Nov 2006 – Feb 2008: **Europe Financial and Asset Management Analyst**

- **UK Asset Management:** financial consultant on sale of several North Sea oil and gas fields. Provided advice on deal structures, sale and purchase agreements, contract clauses, interpretation and implementation of agreements, advisory support to the Commercial Department and earnings calculations.
- **Finance Projects Co-ordination:** key contact and business line interface in the £160m sale of a major UK entity (2007).
- **Financial and Operating Analysis:** preparation and presentation of the operating analysis of the Production business, monthly 2-hour presentations delivered to the Europe Caspian and Russia Vice President and up to 12 senior managers.
- **Supervisory experience:** 8-month training, support and supervision of assistant asset management analyst. Monthly co-ordination of submissions from 4 European analysts.

Sept 2004 – Oct 2006: **Internal Auditor (Europe Africa and Middle East)**

- **Participated in and led teams** of up to 6 people in a variety of internal audits including financial, corporate control, LNG, business process, treasury, manufacturing, sales, marketing, pricing, retail, joint venture and contractors.
- **International experience:** assignments of up to 5 weeks undertaken in Qatar (LNG), Saudi Arabia (refinery), Azerbaijan (development projects), Norway, Italy, Belgium, Hungary and various other UK locations.
- **Control, co-ordination and presentation** to senior management of \$10m EAME budget.

Sept 2003 – Aug 2004: **Corporate Controls Adviser**

- Responsible for identifying strategic improvements to financial and non-financial corporate controls and working with business divisions to implement the tools to deliver improved results. Trained over 300 employees.

### Education / Associations

- 2019 LNG SPA Drafting Committee Co-Chair for AIPN Model Contracts
- 2019 Association of International Petroleum Negotiators (AIPN)
- 2013 Association for Project Management (APMP)
- 2008 Association of Corporate Treasurers (AMCT)
- 2006 Chartered Institute of Management Accountants (CIMA)
- 2003 University of Warwick, BSc (Hons) Economics

### Publications / Presentations

- 2015-Current: Ryan is regularly asked to present or chair panels at a number of global industry conferences and seminars across Gas, LNG and the energy transition
- 2015-Current: Author of several articles on market trends and blogs for Gaffney Cline website
- 2021: Author of revised opening chapter for “Oil & Gas Contracts, Principles and Practice”
- 2019: Author of opening chapter “The Chemistry, Geology, Economics and Monetisation of Oil and Gas” for “Oil & Gas Contracts, Principles and Practice”
- 2017: Author of chapter “New Markets for LNG including marine, road, rail and small scale uses” for “Liquefied Natural Gas, The Law and Business of LNG, Third Edition”
- 2017: Author of opening chapter “The impact of the US shale boom on worldwide natural gas price trends” for “Shale Gas, A Practitioner’s Guide to Shale Gas and & Unconventional Resources, Second Edition”

## Devassy Varghese

An economist with 10 years' experience in petroleum economics. Extensive experience working with a wide spectrum of oil and gas participants such as operators, joint-venture partners, regulatory/government bodies, and midstream companies in an economist role. Key regions of working experience include North Sea, Africa and MENA.

### Key Areas of Expertise

- Building Discounted Cash Flow (DCF) models based on various fiscal and commercial contracts such as Royalty/Tax, Production Sharing Contracts, Service Agreements, LNG contracts, commercial agreements, project financing agreements.
- Economic/financial analysis and valuation.
- Software: Model building with Microsoft Excel and PalantirSUITE of tools; proficient in using market intelligence databases such as WoodmacGEM, RystadCUBE, and IHS Vantage.
- Expert in North Sea fiscal regimes (UK, Norway, Denmark).

### Professional Experience

Apr 2019 – Present: **Senior Economist** – Gaffney, Cline & Associates Limited

- Economics of Gas to Power projects
  - As part of a small-scale LNG to power project feasibility study, created a financial model that determined minimum PPA tariff levels for the project to meet investment criteria, calculation and comparison of LCOE of project.
- Numerous economic evaluations for Reserve Audits and Competent Person Reports
  - Economic modelling and financial analysis to calculate cessation of production and asset value estimates.
- Due diligence for Mergers and Acquisitions
  - Red flag report and asset valuations representing both buy side and sell side projects.
- Government Advisory
  - Advised an African Government on project financing and impact on project economics.
- Midstream and Integrated Economics
  - Advised an asset management company about the economic life of integrated infrastructure assets under different economic and commercial scenarios.

2013 – 2019: **Senior Consultant** – Palantir, London, UK

- Advised international oil and gas companies on economic evaluation and supported their business plan activities.
- Part of the Palantir software implementation team at various international and independent operator clients. Successfully led the fiscal regime modelling and benchmarking to client's economic models.
- Economic modelling specialist in Palantir with ownership of North Sea fiscal regime development. Proficient in Hub model economics and PORTFOLIO optimization techniques.

2017: **Consulting Economist** – Maersk Oil, Copenhagen

- Consulting Economist at Maersk Oil, Copenhagen reporting to Head of Economics.
- Lead economist for two business development projects in the North Sea.
- Responsible for asset economics of Danish Business Unit reporting to Portfolio Planning in Copenhagen in H2 2017.

2013 – 2014: **Economics Consultant** – Repsol Sinopec Energy UK Limited, Aberdeen

- Economics consultant and member of the Planning and Analysis team reporting to Planning and Analysis Manager,

- Supported and participated in business plan and reforecasting,
- Implemented ring-fenced corporate tax model by implementing changes to RFES calculations, Supplementary tax and decommissioning costs carry-back calculations in Palantir.

2012 – 2013: **Business Analyst Consultant** – Palantir, Bangalore

- Supported clients in the Asia-Pacific region on Palantir economic modelling.
- Worked extensively on the Palantir Regime Library - research, modelling and updating fiscal regimes (using VBA and Excel).

2010 – 2012: **Senior Business Analyst** – Derrick Petroleum Services, Bangalore

- Worked as oil and gas upstream research analyst for Rystad Energy, Norway based E&P Strategy advisory firm (client).
- Worked extensively on fiscal regimes of Russia, Kazakhstan and Former Soviet Union countries and valuation analysis of E&P companies in the region.
- Trained users on PalantirSUITE of applications

### Languages

- Malayalam
- Hindi
- Tamil
- English (fluent)

### Education

- 2010 MSc (Hons), Chemistry, Birla Institute of Technology and Science, Pilani, India
- 2010 BE (Hons), Chemical Engineering, Birla Institute of Technology and Science, Pilani, India

### Publications

- 2021: Author of market trends and outlook report published by EvaluateEnergy: “2021 and Energy Transition: The Outlook for Energy Portfolios and M&A”