

Joanna C. Martin Ziegenfuss
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SUMMARY

Ms Joanna Martin Ziegenfuss, Associate Director of BRG's Energy Practice offers 15 years of market, commercial and technical experience in the global energy industry. Her expertise encompasses LNG, SSLNG, power generation, renewable energy, and energy assets environmental assessments. She has led market, commercial and economic analyses, regulatory risk assessments, project due diligences, strategic investments, and environmental impact assessments of energy assets.

Ms Martin Ziegenfuss has delivered market, project feasibility and due diligence assessments for end-users seeking to switch from petroleum fuels to natural gas; infrastructure developers seeking investment opportunities; and market players needing a market entry business strategy. She has led international engagements for international financial institutions, investment banks, private equities, sovereign entities, major international energy companies, fuel end-users, project developers and equipment providers.

Ms Martin Ziegenfuss has also provided key energy market expertise in a number of international commercial disputes under the ICC rule.

Her oil and gas expertise is underpinned by a strong environmental background gained in her earlier career, when Ms Martin Ziegenfuss worked as an environmental specialist on upstream development feasibility and as an environmental advisor for an international oil company ensuring environmental compliance.

Ms Martin Ziegenfuss has undertaken project work in the following countries: UK, Germany, France, Netherlands, Algeria, Egypt, Oman, Pakistan, Afghanistan, Kenya, Uganda, Columbia, Mexico and the US.

EDUCATION

MBA. Strategy, Economics and Finance	Cranfield School of Management, UK
Post Graduate Certificate in Project Finance	Middlesex University London, UK
APMP qualification	Association of Project Managers, UK
CEnv. Chartered Environmentalist	Society for the Environment, UK
Level 3 City & Guilds Cert. in Petroleum Processing Technology	OPITO, UK
MSc. Marine and Fisheries Science	University of Aberdeen, UK
BSc. Hons. Marine Biology	University of Wales, Swansea, UK

PREVIOUS POSITIONS

2015 - 2017: *Independent Energy Consultant, Washington, DC, US*

2013 - 2015: *Senior Project Manager, Pace Global / Siemens, London, UK & Washington, DC, US*

2011 - 2013: *Senior Consultant, Mott MacDonald Ltd, London, UK*

2004 - 2011: *Consultant, Genesis Oil & Gas Consultants Ltd, London, UK*

2000 - 2004: *Marine Scientist, Fisheries Research Services, Aberdeen, UK*

PROFESSIONAL EXPERIENCE

LNG Commercial and Technical Projects

- **Project finance and commercial advisory to small scale U.S. LNG and NGL exporter.** Advising c-suite and commercial team on various aspect of the project to support capital raising.
- **Commercial strategy for global gas and LNG portfolio design, marketing, and pricing for a global LNG supplier.** Project managed the global LNG and European natural gas teams in advising a global LNG supplier on its commercial strategy for long- and short-term LNG sales and pricing over the coming decade. This involved detailed analysis of global gas and LNG supply, demand, flows, contracts, and pricing in the short- and long-term markets.
- **Expert risk and market evaluation of energy infrastructure loans across the globe within a \$3 billion portfolio of energy loans for an international investment fund.** Led the analysis of key market, commercial and geopolitical risks on the return on investment for each asset. Assets reviewed included ten LNG assets across U.S, U.K, Australia, Papua New Guinea, Mexico and Singapore and seven gas power plants across the U.S, Philippines, Mexico, Oman, Saudi Arabia
- **Onshore LNG regasification terminal in Mombasa for the Kenyan Ministry of Energy.** Led the project management, market research, analysis and a multidisciplinary team of engineers and financial experts to develop the financial, engineering feasibility as well as an environmental impact assessment of the proposed terminal.
- **Pre-investment Due Diligence for a floating regasification LNG terminal project in Pakistan for an International Financial Institution.** Analyzed the validity of CAPEX, OPEX and technical assumptions, working with a multidisciplinary team of engineers to assess the reasonableness of the business model in view of the market, environmental compliance and operations management. Resolutions and mitigation measures of identified key risks were recommended to resolve and reduce the client's risk exposure.
- **Floating Liquefaction Facilities (FLNG) development costs for an oil major.** Review on FLNG development costs and schedules worldwide to support a project screening process.

Small Scale LNG Market and Commercial Analyses

- **North American LNG peakshaving plant functionality change evaluation for the American Gas Association.** Undertook a review of drivers and inhibitors to the expansion of LNG peakshaving plants' primary functionality to a merchant functionality in order to service the SSLNG market.

- **U.S. LNG trucking standards and codes gap analysis for the American Gas Association.** Analyzed the status of the U.S. LNG vehicle market, and factors mitigating its growth. Identified steps to resolve the disparity in standards and codes to facilitate the adoption of LNG in the natural gas vehicle market.
- **North American market analysis of LNG adoption across various sectors for a Global oil and gas equipment manufacturer.** Identified key sectors and markets for the client's 6,000 gpd liquefaction technology. Forecasted LNG adoption by 2020 and 2035 in the US, Canada and Mexico in the following sectors: oil & gas drilling and flaring, industry, remote communities and mining. Advised on potential revenue and key market strategy approach.
- **US & Canada market analysis of LNG adoption by region in key markets by 2025 for a Japanese investment corporation.** Undertook a Comprehensive analysis of potential LNG demand growth and value in key markets (marine bunkering, trucking, mining, rail, oil and gas, and off-grid industry) by region. Analysis based on diesel demand growth and end-user LNG adoption model. Presented LNG supply overview, technology developments, costs by markets and strategic assessment of most profitable market and region for client to target.
- **Mine site haul trucks LNG conversion and financial analysis for a US LNG project developer.** Undertook a mining haul trucks LNG conversion analysis (fuel consumption, opex and capex) in support of financial transaction.
- **Positioning of small scale LNG liquefaction technology and approach to market for a US oil and gas equipment manufacturer.** Assessed the potential market for a 700 gpd liquefaction technology ahead of the client building a prototype. Undertook an evaluation of the client's liquefaction technology market positioning based on technology performance and competitive advantages. Proposed business models in key niche markets based on the client's technology competitive advantages.
- **150,000 gpd LNG liquefaction facility off-take market analysis for a US Private Equity firm.** Assessed the financial viability of a liquefaction plant based in Texas ahead of the FID. Analyzed the future potential LNG demand from regional key markets including: E&P drilling and fracking, trucking and marine bunkering, and competition from proposed and existing regional liquefaction plants. Forecasted off-takers demand and plant potential revenue and ROI, as well as competing risks from regional export plants.
- **Analysis of LNG bunkering fuel costs for a new dual fueled barge for a US Private Equity firm.** Analysed the financial benefits of investing in an LNG dual-fuel articulated tug barge, including the supply and pricing of LNG and competing fuels along the Louisiana and Florida coast line. Assessed the cost benefit of LNG fuel and ROI and identified the most economical locations to source LNG fuel.
- **Pre due-diligence assessment of two small scale liquefaction plants on US Gulf Coast for a US Private Equity firm.** Undertook a high level review of proposed projects to gauge whether they were worth investing the expense to undertake due diligences and sign associated term sheets. Reviewed pricing and tolling assumptions in relation to the facilities respective markets, capital cost

evaluation of both facilities, typical project development activities, regulatory process and financial structuring schedule. Presented a risk assessment of reviewed items.

- **US West Coast LNG bunkering demand analysis by 2025 for a US Utility.** Assessed the LNG bunkering adoption along the West Coast of the US by 2025 and 2035 in key ports and regional LNG supply infrastructure development. Analysis based on marine bunkering end-user LNG adoption model and segmented by ship type. Delivered forecasted volumes and market value by key ports and identification of strategic location to extend client's business portfolio.
- **LNG adoption forecast in key markets in six US Northeast states by 2025 for a US Utility.** Undertook the analysis of the potential for diesel displacement by LNG in the following key markets: marine bunkering, trucking and industry based on diesel demand growth and end-user LNG adoption model. Delivered strategic insights on key favorable markets for the client to target and leverage existing natural gas assets to enter the CNG/LNG market.
- **LNG adoption along the Rhine Corridor for the EU LNG Masterplan for the Consortium of Rhine ports.** Undertook a comprehensive analysis of future LNG demand adoption in key markets (short-sea shipping, inland waterways vessels, trucking and off-grid industry) along the Rhine corridor across the Netherlands, Belgium, France, Germany and Switzerland. Analysis based on diesel demand growth and end-user LNG adoption model and key national economic factors.
- **LNG and CNG vehicle European market study for a German Energy Company.** Undertook a comprehensive analysis of forecasted growth of CNG and LNG heavy duty vehicles in Northern Europe.

Oil and Gas Project Feasibility Studies and Due Diligences

- **Fueling Station Regulation Due Diligence for a Private Equity Firm in Mexico.** Led a regulatory gap analysis and risk identification on the regulatory compliance of the concept design of a compact, modular, multi-fuel fueling station of a start-up venture for a private equity firm in Mexico. The analysis included a detailed review of diesel, gasoline, LNG and CNG fueling regulations, codes and standards in the U.S and Mexico.
- **Grassroots refinery feasibility study in Afghanistan for a private consortium.** Led the project management, multidisciplinary team of engineers and financial experts to define a feasible design concept for a refinery in a remote location of Afghanistan.
- **200 million bbl. crude oil storage terminal feasibility study in the Middle East for a major oil company.** Led the project management, market research, analysis and multidisciplinary team of engineers and financial experts to develop the financial and engineering feasibility.
- **Pre-investment technical, operational and environmental due diligence of an onshore oil field in France with shale gas assets for an investment bank.** Analyzed the validity of CAPEX, OPEX

and technical assumptions, working with a multidisciplinary team of engineers to assess the reasonableness of the business model in view of the market, environmental compliance and operations management. Resolutions and mitigation measures of identified key risks were recommended to resolve and reduce the client's risk exposure.

- **Pre-investment technical, operational and environmental due diligence of an onshore oil field in the UK for an investment bank.** Analyzed the validity of CAPEX, OPEX and technical assumptions, working with a multidisciplinary team of engineers to assess the reasonableness of the business model in view of the market, environmental compliance and operations management. Resolutions and mitigation measures of identified key risks were recommended to resolve and reduce the client's risk exposure.
- **Pre-acquisition due diligence on the infrastructure and operations of one of Europe's largest oil and chemical storage terminals in Rotterdam for an oil company** Analyzed the validity of CAPEX, OPEX and technical assumptions, working with a multidisciplinary team of engineers to assess the reasonableness of the business model in view of the market, environmental compliance and operations management. Resolutions and mitigation measures of identified key risks were recommended to resolve and reduce the client's risk exposure.

Energy Industry and Quantum Expert for International Dispute Resolution

- **Ongoing Investment Dispute Regarding a Petroleum Refinery.** Provided industry expert analysis of the domestic and import markets and pricing for refined petroleum products in an emerging market country. Analyzed the regulatory promises associated with the investment, the government's adherence to these promises, and counterfactual scenarios for refinery sales and revenue had the regulatory promises been kept in full.
- **Ongoing Commercial Arbitration Regarding Electric Utility Shareholders' Agreements.** Project managed and contributed to an expert analysis of energy market fundamentals, business practices, and damages related to the claims of a lead shareholder in large electricity generation and distribution companies in a developing country against the controlling JV partner. The claims included alleged violations of the JV agreement related to profit sharing, investments, divestitures, service contracting, and branding. Final expert reports and testimony are pending.
- **Ongoing Commercial Arbitration Regarding LNG to Power Project PPA.** Project managed and contributed to an expert analysis and a first report regarding the energy market fundamentals, industry practices, and quantum of damages for the alleged breach of a power purchase agreement ("PPA") for an LNG to power project for the national utility offtaker in a developing country. The claim regarded the alleged effort of the utility to effectively cancel its commercial commitments under the PPA.
- **Ongoing Commercial Arbitration Regarding LNG to Power Project JDA.** Provided independent expert analysis and a first report regarding the energy market fundamentals, industry practices, and quantum of damages for the alleged breach of a Shareholder's Development Agreement for a LNG

to power project in a developing country. The claim regarded the alleged effort of the claimant's JDA partner to change its development strategy, and replace the claimant's approach to engineering, procurement and construction ("EPC") contracting and project financing with an alternative approach that allegedly harmed the claimant.

- **Ongoing Litigation Regarding Alleged Fraud in LNG Procurement.** Undertook detailed LNG market analysis for counsel regarding alleged fraud in LNG procurement arrangements for supply to an Asian buyer under a short-term LNG sale-purchase agreement.
- **Point Lisas Nitrogen Ltd. v. The national Gas Company of Trinidad.** For a commercial arbitration regarding the renewal of a natural gas supply contract, undertook analysis for the expert report on the historical evolution and long-term outlook for natural gas demand and supply availability in a major LNG producing country in the Americas for a commercial arbitration between the national gas company and a large industrial consumer.

Environmental Projects

Consulting Engagements

- **Expert risk and market evaluation of renewable infrastructure loans across the globe within a \$3 billion portfolio of energy loans for an international investment fund.** Led the analysis of key market, commercial and geopolitical risks on the return on investment for each asset.
- Market analyses of the Spanish and Italian renewable markets for a private consortium.
- Managed the environmental support for upstream onshore and offshore projects run by energy companies in Europe, Algeria, Kazakhstan, Uganda and Egypt.
- Provided sustainable concept solutions to reduce upstream development projects CO2 foot prints thereby increasing energy efficiencies and reducing the environmental cost of project development.
- Undertook Environmental Impact Assessments of new upstream offshore installations in the North Sea and secured environmental consent applications and permits for offshore operations in UKCS.

Environmental Advisor to an International Oil Company

- Managed the offshore installations daily environmental compliance for continuous legal operation.
- Successfully reduced the offshore installations' environmental foot prints by 10%, working with multi-disciplinary teams and developing corporate environmental KPIs.
- Responsible for selection and management of Project ESIA Consultants, preparation of tender documentation, technical scope of work and evaluating bids in tender reviews.
- Researched and appraised emerging UK and international environmental regulations to identify environmental trends and shape business decisions.

PRESENTATIONS

- *Extending the Asset Return of North American LNG Peakshaving Plants*. World Gas Conference, Washington, DC, 2018.
- *North American Marine Bunkering with LNG: Technical Opportunities, Challenges and Recent Experience*. With Ted Williams. World Gas Conference, Washington, DC, 2018.
- *The Role of FSRUs in the LNG Market*. LNG Global Congress Americas Conference, Houston, 2017.
- *ECA Update: Coastal Zone and Inland Waterways Shipping*. LNG Fuel Summit & LNG Fueled Tugs and Barges Conference, New Orleans, 2016.
- *LNG Lowdown: Changing Market Drivers*. LNG Fuel Summit & LNG Fueled Tugs and Barges Conference, New Orleans, 2016.
- *LNG Fuel: The Trailblazers*. LNG Global Congress Americas Conference, Houston, 2016.
- *US Shale Exuberance, the Prospects for U.S. LNG Exports*. 3rd Annual Global LNG Forum, Lisbon, Portugal, 2013.

PUBLICATIONS

- *Public Private Partnerships Driving the Integration of Renewables into Microgrids*. Co-author. Dentons Smart Cities Think Tank. May 2019.
- *LNG, Let's Get Small, Steve*. Co-author. Project Finance International. Global Energy Report April 2018
- *The New LNG Flexibility Imperative*. Co-author. LNG Industry. April 2018
- *The Big Potential of Small-scale LNG*. Energy Industrial Council. Energy Focus. Winter 2018
- *Will the US Make a Splash in China?* Lloyd's List Maritime Intelligence. June 2017.
- *Off the Scale: On the Current State of Small Scale LNG*. KNect365. April 2017.
- *The Time is Ripe for Small Scale LNG*. LNG Industry magazine. October 2016.
- *LNG Fuel Remains Cost Competitive in Low Crude Price Environment*. Pace Global North American Distribution List, February 2015.
- *Electricity Capacity Mechanisms in France*. Pace Global European Distribution List. January 2013.

PROFESSIONAL MEMBERSHIPS

- United States Association for Energy Economics, US
- Women's Council on Energy and the Environment, US
- Society for the Environment, Chartered Environmentalist, UK

LANGUAGES

French (native), English (fluent), German (intermediate).