

Company Brochure

THE COMPANY

Petroleum Development Consultants was formed in 1988 and is based in London with its excellent international connections providing an ideal base for its international operations. The company's activities concentrate equally on both upstream and downstream sectors of the oil and gas industry. Our clients include the World Bank, the European Commission, the European Bank for Reconstruction and Development as well as many oil companies such as BP, British Gas and Shell. We have also worked for a number of state oil companies and large and small international oil companies.

KEY AREAS OF EXPERTISE

We have a number of areas which we feel are our core expertise, which reflect what we do and the experience of our staff and associates. We adopt a flexible approach to projects and are happy to co-operate with other consulting companies if this provides a better service to our clients.

Our **unique selling point** when comparing ourselves to our competitors is that we have the ability to provide a service across the oil and gas value chain Upstream and Downstream, encompassing exploration, appraisal, development and production of oil and gas to governmental regulation and market development of resources. Using geoscientists, reservoir engineers and process engineers we are able to link the subsurface to the surface linking the reservoir to the facility and using our downstream experts to the market. PDC's services are grouped as follows:

- **Subsurface**
 - Integrated Subsurface Studies
 - Asset Evaluations
 - Reservoir Studies
 - Reserves Auditing/Reporting
 - Unconventional Resources
- **Engineering**
 - Field Development Planning
 - Process Engineering
 - Conceptual Designs
 - Project Management
- **Commercial & Legal**
 - Gas Market Development
 - Field Commercialisation Studies
 - Market Studies
 - Energy Regulation & Liberalisation
 - Expert Witness

Subsurface Studies:

Integrated Subsurface Studies

Utilising our geoscientists, reservoir engineers we can offer either an integrated solution to subsurface studies or when taken into its constituent part a G&G or reservoir engineering project.

Examples of our work are as follows:

- **Argentina** – Regional study of the Neuquén Basin to identify leads and prospects on an onshore block held by Repsol YPF
- **Argentina** – PDC worked on redeveloping the Lunlunta Carrizal oil field for Repsol YPF by utilizing a team of geoscientists, reservoir engineers and process engineers
- **Nigeria** – Asset evaluation of offshore gas field reviewing geological models, reservoir models, GIIP volumes
- **Papua New Guinea** – Asset evaluation of onshore gas field reviewing geological models, reservoir models, GIIP volumes

Asset Evaluations and Due Diligence Studies

PDC has assisted clients in evaluating upstream and downstream oil and gas assets through attending both physical and virtual data rooms and visiting facilities in person.

- **Nigeria** – Evaluation of billion barrel oilfields which were being divested by Shell for a confidential client
- **Nigeria** – Evaluation of gas field in Niger Delta, the study required a visit to Lagos to review data
- **Egypt** – Evaluation of East Bahariya block in the Western Desert conducted through a virtual and physical data room
- **Egypt** – Evaluation of Gulf of Suez oil fields carried out through a physical data room
- **Russia** – Evaluation of gas condensate field in the Samara region through a physical data room in Tatarstan
- **Jordan** – Evaluation of Block 1 as part of an open bidding round
- **Ireland** – Assisting client in reviewing data for an offshore gas field as part of an asset divestment transaction

- **Russia** – Advising European Bank for Reconstruction and Development on providing funding for a gas processing facility in Siberia
- **Romania** – Advising Gazprom on acquisition of gas distribution company
- **Kyrgyzstan** – Advising European Bank for Reconstruction and Development on possible investment to fuel stations group
- **UK** – Advising major Australian financial company on oil storage facility acquisition
- **Mongolia** – Advising European Bank for Reconstruction and Development on possible investment to fuel stations group
- **Nigeria** – Technical consultant, privatisation of LPG bases for Bureau of Public Enterprise
- **Nigeria** – Technical consultant, privatisation of National Gas Company for Bureau of Public Enterprise

Reservoir Engineering

- **Ivory Coast** – Peer review of clients reservoir model
- **UK** – Reservoir simulation model of Triassic reservoir for an offshore oil field
- **Iran** – Reservoir model for the development of the BB heavy oil field
- **UK** – GAPS model of offshore gas field prior to tie back to production platform

Reserves Certification

PDC assists organisation both private and public to assist in reserves based lending or to satisfy regulatory obligations, examples of which:

- **UK North Sea** – Technical reserves report for development of West of Shetland development
- **Ivory Coast** – Competent persons report for a 1 billion barrel oil field offshore Ivory coast as part of a reserves based lending project
- **Mozambique** – Reserves report for two onshore gas fields as part of a reserves based lending project which raised US\$100 million
- **Tanzania** – As part of a project to commercialise gas reserves in the country PDC calculated resource figures for the commerciality of an onshore pipeline The clients were RAK Gas Tanzania and Tanzania Petroleum Development Corporation (TPDC)
- **Kenya** – As part of a project to improve E&P terms in the country PDC calculated the resource figures of undiscovered prospects
- **EU** – Conducting study on European refinery air pollution and compliance with environmental regulation

Unconventional Resources

PDC is rapidly building up its experience within the unconventional resources domain, examples of projects completed are as follows:

- **Colombia** – Formulating model contract and regulatory regime for the exploration and production of unconventional resources within the country. PDC carried out conceptual development scenarios for shale gas field to evaluate impact of high volume of drilling and fracking on the economics of the fields
- **Europe** – Field development planning for tight gas field later leading to EPC of the gas processing facilities
- **Poland** – Field development study and economic evaluation of the Siekierki gas field.
- **Slovenia** – Commerciality and development study of tight gas field with focus on evaluating well flow rate after fracking, an additional study was commissioned to project manage the development of the asset which is currently ongoing. (A public copy of the report is available on request)
- **Hungary** – Assisting major oil and gas company in identifying unconventional plays

Engineering Services:

Field Development Planning

Examples of our work in this area are as follows:

- **Abu Dhabi** – Carrying out a project for ADMA-OPCO developing field plans for two large offshore oil fields in production for thirty years. Field development plans to cover the next 35 years of production
- **East Mediterranean** – Shadowing the development of a giant gas field for a governmental client. Providing technical expertise during partner meetings and independent evaluation of operators plans
- **Romania** – Managing design procurement of three onshore gas fields including production facilities, flowlines, compression and export pipeline.
- **Romania** – Field development plan of Bobocu tight gas field for Zeta Petroleum
- **Argentina** – Prepared re-development plan for RepsolYPF for the Lunlunta-Carrizal field in production since 1950 concentrating on workovers and infill vertical and horizontal wells
- **Argentina** – Preparing re-development plan for RepsolYPF for the Pedras Negras oil field

Conceptual Design

Examples of our work in this area are as follows:

- **Colombia** – Preparation of conceptual designs for shale gas developments allowing the calculation of CAPEX figures. This allowed the company to develop potential incentives to Colombia’s shale gas fiscal regime.
- **Tanzania** – Pre-feasibility study for a gas pipeline from the Songo Songo gas field to run along the coast to industrial customers and to export to neighbouring countries. The conceptual study reviewed scenarios with differing number of compressor stations and different sized piping.

Process Engineering

- **Mozambique** – modelling flow of gas from wells to the gas processing facility for the Pande & Temane gas fields
- **Romania** – Conducting process engineering of the Bilca gas processing facility as part of field development planning and construction project management
- **Australia** – As part of a high profile expert witness case PDC process engineers modelled the offshore facilities using Process Engineering tools such as Hysys simulation to highlight the processes of gas production
- **Tanzania** – Developing a conceptual design for a gas pipeline linking existing and potential gas developments to indigenous customers and export out of the country.

Project Management

PDC’s project management team has extensive experience in the supervision and coordination of multidiscipline engineering design, procurement and construction management teams and works closely with the clients to determine appropriate solutions.

Examples of our work include:

- **Romania** – Project managed the construction of the gas processing facilities of the Bilca gas field
- **Slovenia** – Project development advice for the development of a tight gas field

Commercial & Legal:

Gas Market Development

PDC has worked extensively in the development of gas industries with governments, NOC's and oil and gas companies.

- **Indonesia** – Preparation of Gas Development Master Plan for Ministry of Planning covering both upstream and downstream gas sectors
- **Kenya** – Advising National Oil Company of Kenya on improvement of E & P policy and particularly addition of specific gas terms
- **Tanzania** – PDC carried out a prefeasibility study for a pipeline to run along the coast of the country to monetise potential new discoveries and link them to market
- **Nigeria** - PDC reviewed LNG pricing trends for LNG sales contracts from Nigerian LNG for a group of banks financing this project.
- **Ireland** – Developed model of gas transportation pricing to support field development and working for Commission for Energy Regulation on distribution pricing
- **Vietnam** - PDC supported PetroVietnam with their negotiations with BP on the Nam Con Son gas field which lead to a \$2 billion investment in the country.
- **Israel** – Assisting the Natural Gas Authority on the development of the gas transportation and distribution industry
- **Ireland** – Supported the negotiation of a gas contract for offshore gas field with RWE Energy
- **Kenya** – PDC successfully completed a project for the Ministry of Energy which involved a LPG supply/demand for the East Africa region. PDC also provided a preliminary design for the necessary LPG import infrastructure.
- **Papua New Guinea** – Evaluation of Puk Puk gas field as part of a plan to potentially develop as LNG

Field Commercialisation Studies

- **Slovenia** – Commerciality and development study of tight gas field with focus on evaluating well flow rate after fracking, an additional study was commissioned to project manage the development of the asset which is currently ongoing. (A public copy of the report is available on request)

Market Analysis

We carry out a wide variety of market analysis covering in detail the oil and gas industries.

Examples of our work in Gas Markets are as follows:

- **Romania** – Leading development of three gas fields in northern Romania and carrying out gas sales negotiations
- **Ireland** – Supported the development of the Seven Heads gas field. Work included analysis of potential customers and evaluation of transportation pricing issues
- **Poland** – Evaluated the market for an onshore gas field and provided analysis of gas transportation systems and pricing. Prepared economic evaluations
- **Ukraine** – Carried out work on gas reform for Government/World Bank. Evaluated market development of gas reserves, Crimea for EU and EBRD. Gas market studies for JXX and other oil companies in Ukraine
- **Lebanon** – Evaluated potential gas and LNG supply options as part of Hydrocarbon Energy Strategy for Government/World Bank
- **Romania** – Evaluation of gas distribution companies being privatised

Examples of our work in Oil Markets are as follows:

- **Russia** – A number of studies have been carried out including a market study of potential oil and oil production exports through Tallin, Estonia on behalf of the purchaser of Estonia Rail. Study of oil and oil product exports from the Caspian through Poti Port, Georgia on behalf of the EBRD
- **Uganda** – Analysis of oil product market as part of a project on Downstream Regulation for Ministry of Energy/World Bank.
- **Lebanon** – Evaluated potential for rehabilitating two refineries or developing a new refinery as part of Hydrocarbon Energy Strategy for Government/World Bank
- **Croatia** – Evaluated oil and oil product storage requirements for IEA and EU
- **Ukraine** – Advised government on uses for the Odessa-Brody crude oil pipeline

Government Advisory

PDC has been at the forefront of developments in regulation and liberalisation for more than ten years. Examples of our work on Gas Regulation are as follows:

- **Kenya** – Advising National Oil Company of Kenya on improvement of E & P policy and particularly addition of specific gas terms
- **UK** – Acted as technical advisor to the Office of Gas and Electricity Markets (Ofgem) as part of the Price Regulation 2002-7 of Transco the monopoly gas transmission and distribution operator

- **UK** – Technical advisor to the Ofgem on gas transportation and distribution under long-term framework contract
- **Croatia** – Led project developing gas tariffs covering transportation, distribution and storage
- **Ireland** – Developed model of gas transportation pricing to support field development and working for Commission for Energy Regulation on distribution pricing
- **Pakistan** – Carried out evaluation of gas transmission and distribution capital expenditure and benchmarking for Office of Gas and Oil Regulation
- **MEDA** – Mediterranean countries for EU led downstream gas reform workshops
- **Israel** – Assisting the Natural Gas Authority on the development of the gas transportation and distribution industry
- **Saudi Arabia** – Developing technical and commercial regulations for the development of residential gas and LPG distribution system
- **Colombia** – Developing technical and commercial regulations for the development of unconventional resources

Examples of our work on Oil Regulation are as follows:

- **Uganda** – Development of downstream quality and price model for Ministry of Energy/World Bank
- **Tanzania** - PDC carried out a project for Energy & Water Utilities Authority (EWURA) to provide assistance in implementing a bulk procurement system for gasoline, diesel and kerosene
- **MEDA** – Mediterranean countries for EU led downstream oil product and refinery reform workshops
- **EU** – Conducting study on European refinery air pollution and compliance with environmental regulation

Negotiations

PDC has led a number of successful negotiations on behalf of clients including:

- **Vietnam** – Acted as advisor to PetroVietnam in the negotiation of gas contracts with BP to develop the offshore Nam Con Son gas fields leading to total investment of \$2.5 billion
- **Ireland** – Supported the negotiation of a gas contract for offshore gas field with RWE Energy
- **Croatia** – Led project developing gas tariffs covering transportation, distribution and storage

- **Ireland** – Developed model of gas transportation pricing to support field development and working for Commission for Energy Regulation on distribution pricing
- **Pakistan** – Carried out evaluation of gas transmission and distribution capital expenditure and benchmarking for Office of Gas and Oil Regulation
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Expert Witness

PDC has provided expert witness services at a number of international courts including the Arbitration Courts in Stockholm, Copenhagen, Singapore and London.

SOFTWARE USED WITHIN PDC

PDC uses the latest industry standard software:

3-D Field Geological Modelling:	
Petrel	Schlumberger
Full Field Reservoir Simulation:	
Petrel RE/Eclipse	Schlumberger
IMEX	CMG
Well Test Analysis:	

Interpret	Paradigm
Saphir	KAPPA Engineering
PanSystem	Weatherford
Log Analysis:	
Interactive Petrophysics	Schlumberger
Production Data Management & Analysis (Decline Analysis and Economics):	
OFM	Schlumberger
Integrated Production Modelling (Reservoir, Well and Surface Network):	
IPM (MBAL, PROSPER AND GAP) & PVTP	Petroleum Experts
FORGAS/Wellflo/Pipeflo	NEOTEC
Process Engineering	
HYSYS	Aspen
Cost Estimation	
Que\$tor	IHS Energy

KEY STAFF AND ASSOCIATES

Managing Director

David Aron	David is the Managing Director of Petroleum Development Consultants with more than 25 years experience of the oil & gas industry. David is both a petroleum engineer and chartered chemical engineer; he was Chairman of the London Section of Society of Petroleum Engineers (2000-1) and published numerous papers on the oil & gas industry. A Fellow of the Institute of Petroleum and Institution of Chemical Engineers and a Member of Institution of Gas Engineers. He also works as an Expert Witness. He previously worked for Marathon Oil, Tricentrol and Bechtel.
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Company Associates

John Bowers	John is a gas transmission and distribution engineer previously with British Gas and Bord Gais with wide international experience.
Malcolm Brierley	Malcolm Brierley is a geologist with more than 30 years international experience. He is a Fellow of the Geological Society and a Member of the Petroleum Exploration Society of Great Britain. He previously worked for Maxus Energy, Halliburton and Ikoda.
Chris Brown	Chris is a chemical engineer previously with Wood Mackenzie, Chem Systems and Esso who is also a refinery specialist.
Malcolm Groom	Malcolm is a qualified solicitor who has specialised in energy law for over 30 years. Since 2003, Malcolm has been practising as an independent international legal adviser specialising in oil, gas and liquefied natural gas (LNG).
Tim Howell	Tim is a geologist with a BSc Hons in Geology from the University of Wales, specialising in petroleum geology and geophysics.
Rita Jolly	Rita is a petroleum economist previously with BHP Petroleum.

Technical Staff

Temitope Adeyinka	Temitope is a energy analyst having graduated from University of Aberdeen with a masters (distinction) in energy & petroleum. He has previously worked in banking in Nigeria.
Simon Arabo-Nabil	Simon is a petroleum engineer with a BEng in petroleum engineering from London South Bank University. He has previously worked as a translator and interpreter.
Shwan Dizayee	Shwan is a petroleum engineer with a MSc in petroleum engineering from Imperial College London and a BEng (Hons) in chemical engineering from Aston University. He has previously worked for Schlumberger.
Craig Finlay	Craig is a chemical engineer with a BSc (Hons) in chemical engineering from the University of Strathclyde. He has previously worked for Thyssenkrupp and Schlumberger.

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