

A photograph of an oil and gas refinery at night, illuminated by numerous lights. The scene is filled with complex piping, metal structures, and industrial equipment. The lights create a warm, golden glow against the dark sky.

Oil and gas

Oil and gas

Skills and services

Strategic planning
Oil and gas process facilities
Terminals and storage
Refinery and LNG services
Pipelines
Risk, environment and safety
Onshore and offshore facilities

Key services and markets

Project development

Techno-economic evaluation
Project financial appraisal
Concept and feasibility studies
Greenfield and brownfield sites

Project services

Conceptual and feasibility engineering
Front-end engineering design
Detailed design and engineering
Lenders'/owners' engineer
Construction management
PMC and EPCM assignments
Support to EPC contractors
System design studies
Procurement and logistics

Due diligence services

Asset valuation
Contracts review
Technical advisory roles
Expert witness
Operations review
Technical audit
Inspection/maintenance audits

Special skills

Process engineering

Offshore facilities
Flare system optimisation
Gas/condensate and oil production
Optimisation and de-bottlenecking
Facilities and treatment plants

Strategic

Deregulation and common access
Market studies
Policy development
Regulatory advice
Sector reform
Strategic and master planning studies

Pipelines

Economic and operational evaluation
Gas gathering systems
Hydraulic and surge analysis
Multiphase flow analysis
Multiproduct flow
Network analysis
Steady-state and transient flow
Subsea and cross-country
Water and gas injection

Natural gas

Depleted reservoir gas storage
Distribution system design
LNG plant, storage and loading
LPG storage systems and design
Transmission system design
Underground cavern gas storage

Fuel and blending plant

Aviation fuel storage
Hydrant system design
Military fuel systems
Lube oil, gas oil
Unleaded gasoline, bitumen

Terminal and storage facilities


Crude and products storage
Loading systems design
Single point moorings
Jetties and bunkering facilities

Risk, safety and environmental

Consequence, accident and safety assessments
Hazard and risk assessment
Quantitative risk analysis
Sustainability reviews
Constructability reviews

Integrated services

Environmental
Geotechnical
Marine
Mechanical
Telecommunications
Power



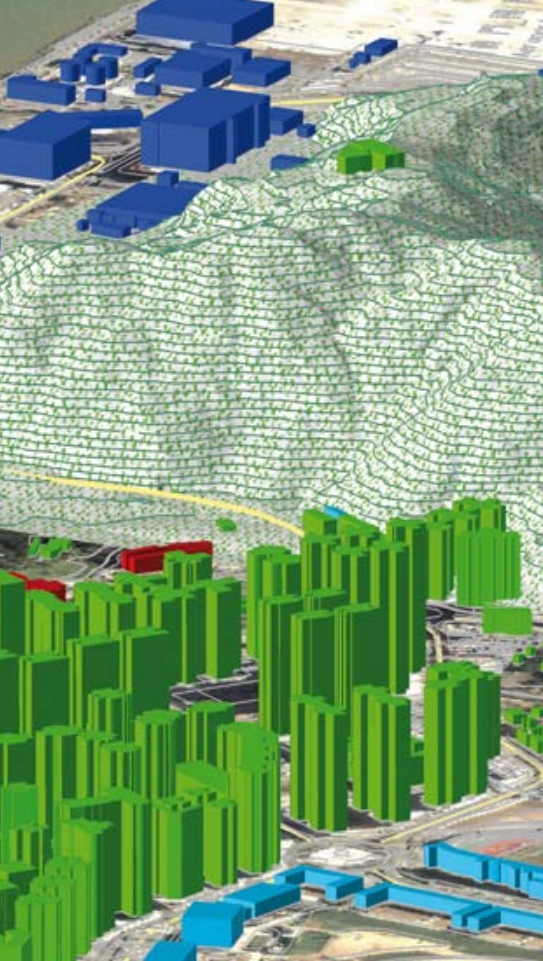
We have a design services contract to engineer upgrading and expansion solutions to this LNG plant in Oman.

Global oil and gas

Mott MacDonald has made a major contribution to the global energy sector. We rank among the world leaders in engineering consultancy and offer a wealth of experience in developing oil and gas projects. In the early 1960s we were working at many of the UK's refineries for Shell, BP and Esso. During the 1970s we were also operating in the North Sea – designing production facilities, pipelines and storage and export terminals – while setting up a network of design offices to serve the major oil producers in the Middle East. From the 1980s onwards we have enhanced our globalisation with many projects in the Middle East as well as undertaking assignments in areas as diverse as Africa, North America, Asia and Australasia.

Today we can take care of every aspect of a project from its initial concept to techno-economic studies, front end and detailed design, upgrades and optimisation plans, hazard and risk analysis, procurement, project management and site supervision. Reinforcing our vast technical base is our leading expertise in strategic, environmental and safety issues as well as a research and development capability.

Through close teamwork we build long term relationships with our clients, assuring them of our total commitment and determination to bring each and every assignment to a successful conclusion. Whether direct contracts, frame agreements, service contracts or EPC, EPCM and PMC contracts we use QA, HSE, QRA, risk assessment, continuous improvement, professional excellence and sustainability protocols and processes to offer our clients a fully rounded service.



3D 'walk through' model developed by us for a local gas distribution system for Macau.

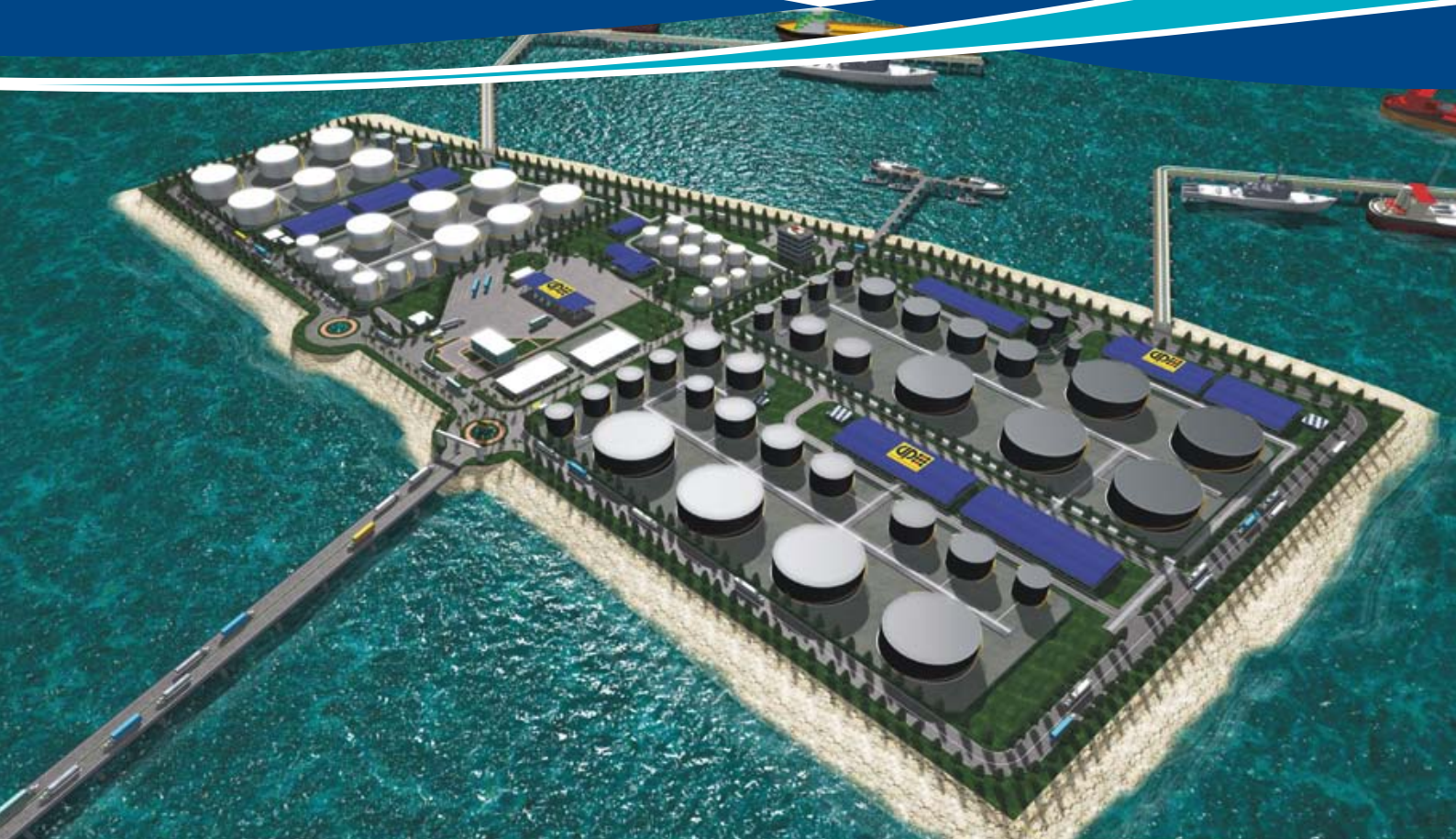
Asia Petroleum Products Storage Hub.

Techno-economic studies

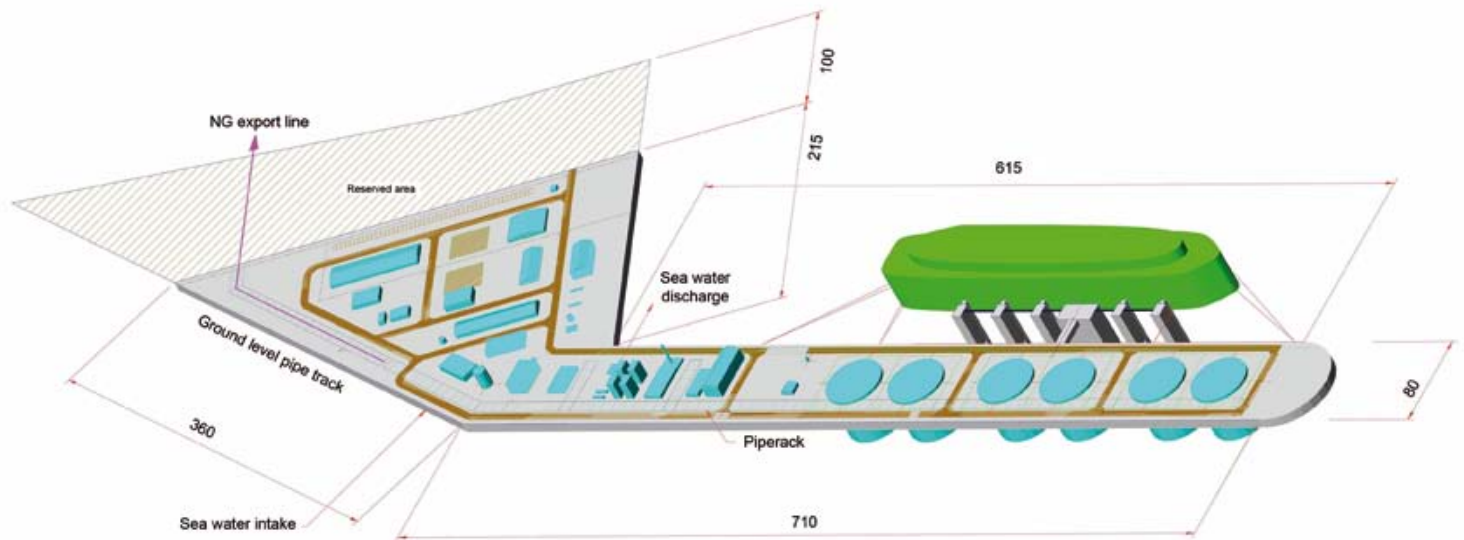
Mott MacDonald is renowned for its independent, world class experience in techno-economic studies, combining its century old technical heritage across all engineering disciplines with class leading financial, economic and consulting expertise. We undertake specialist evaluations and assessments for lending agencies, national and international energy companies, governments and project developers, considering all strategic, implementation and operational aspects using bespoke in-house teams.

We have a solid track record in master planning, institutional reform and restructuring, asset valuations, regulatory advice and related issues such as technology transfer and training. We are also highly respected for our specialist services, including privatisation support, transaction and restructuring support, technical audits and expert witness work.

With environmental and sustainability concerns at the forefront of most oil and gas projects our strong in-house environmental capability enables us to examine the possible effects of our clients' plans and strategies on the wider socio-environment – then recommend and implement optimum management regimes.



We incorporate safety, quality, environmental and sustainability measures into all projects from day one



Mott MacDonald developed an LNG jetty storage proposal during the concept definition phase of an LNG receiving facility in Europe.

Conceptual design

A project's conceptual phase demands lateral thinking and innovative ideas – underwritten by experience and solid engineering skills. As process engineering issues are normally fundamental in petroleum projects, our highly skilled process centre of excellence gives us a distinct advantage, with a proven track record in the oil and gas industry, both onshore and offshore. We provide core engineering with detailed design expertise as well as conceptual and front-end design experience – always ensuring that safety, reliability, value engineering, constructability, sustainability and risk issues, as well as environmental compliance, are fully integrated into the design process from the outset. The process team is fully supported by multidiscipline skills in the core areas of mechanical, piping, pipeline, control and instrumentation, electrical, cathodic protection, civil and structural design and engineering.

Using the latest computer simulation and visualisation techniques we have developed animations to enhance understanding of complex behaviour such as pipeline upheaval buckling and deepwater riser interference plus fluid and smoke flow patterns – ‘frontier’ work, expanding the international body of knowledge. As well as benchmarked in-house programs and proprietary discipline based design tools, we also implement integrated design techniques using programs such as PDS and PDMS. For multisite working we use a Group preferred intranet programme.

Being part of a multidisciplinary Group means we can provide all other engineering services and disciplines required to complete a project – a true one-stop service.



A section of the Cawthorne Channel central gas plant in Nigeria for which Mott MacDonald undertook the detailed design and engineering.

FEED and detailed design

Whatever the infrastructure involved, front-end design and detailed engineering services plus all technical aspects of procurement form the core of our work in the oil and gas sector. Our in-house multidisciplinary teams include process engineers supported by mechanical/rotating equipment specialists, piping engineers, electrical and CP specialists, control and instrumentation engineers, civil, structural and pipeline engineers. Peripheral services such as environmental, cartographic, telecommunications, materials and metallurgy plus power distribution services can be provided as required. For projects large or small, teams are brought together to provide the most cost-effective solution to the client.

Front-end and detailed engineering are often undertaken directly for our multinational oil and gas clients. For EPC contracts we are fulfilling detailed engineering and procurement assignments with major contractors, either in partnership or as a sub-contracted service.

Process engineering

Our process engineering centre of excellence offers capabilities spanning the whole spectrum, including GOSP, natural gas processing and compression, gas/condensate production, sour gas and crude oil, waxy oils and condensates, LNG and LPG plant and heavy oilfield development.

Using the latest process engineering tools – PRO II, PROVISION, OLGA, HYSIM, HYSIS and SYNERGEE for example – we've carried out assignments in almost every area of production. We're thoroughly familiar with major oil company standards and international standards such as ANSI/ASME, API, ISO, BS, DnV and NACE and are fully versed in the specification of unusual materials for services such as sweet or sour wet natural gas and sour, waxy crudes.

With this track record we're ideally equipped to plan, evaluate and analyse oil and gas production and processing facilities – and then look after every stage from conceptual and front-end design through to detailed engineering.

Lateral thinking and innovative ideas underwritten by experience and solid engineering skills

Part of the Rabi 3 gas compression plant in Gabon for which Mott MacDonald undertook the detailed design as part of a full EPCM contract.





Pipeline trench construction and welding prior to trench installation – Mott MacDonald was contracted as the PMC contractor for these major works in the Middle East (above and below).



Pipelines

From major on-land gas gathering schemes to large diameter transmission pipelines, our specialist engineers have in-depth knowledge of the design, engineering and operational criteria relating to the construction of overland and subsea pipelines. For projects spanning the globe we've been commissioned to provide complete transmission systems for oil, gas and water, together with all associated pumping, treatment, booster, pressure reduction and metering, pigging and block valve stations.

Surge calculations, corrosion analysis and hydraulic modelling of multiphase flow are just some of the skills we offer in addition to mainstream engineering. We also carry out advanced structural and reliability analysis to prove pipeline integrity in operation. We're fully conversant with all design requirements for oil and gas pipelines – especially protecting against corrosion and preventing crude solidification, hydrate formation and hydrogen induced cracking. Our innovative design work, always with a view to maximising value engineering for our clients, includes techniques such as limit state design, upheaval buckling analysis, exotic (and fit for purpose) materials selection, zigzag pipeline alignment design and the pioneering use of seaweed mattresses for the stabilisation of subsea spans.

Our offshore experience covers every facet of subsea pipeline design – stability, coating, wrapping, cathodic protection, pipelay analysis and rock dumping to name but a few.

Terminals and storage

In addition to total capability in process, mechanical, civil, electrical and control system engineering, we can call upon the Mott MacDonald Group's extensive geotechnical, foundations and maritime engineering capabilities to provide true one-stop services. For the oil and gas industry this means our planning and design expertise extends to all kinds of oil and gas loading, transshipment and bulk handling terminals and storage facilities. We offer specialist experience in facilities for handling aviation fuel, gasoline, diesel, LPG, LNG and condensate gas products – indeed, we've earned a reputation for designing jetties and other services to ensure efficient port operations.

Mott MacDonald provided EPCM services for a high flash chemical storage facility in the UAE.



Our role as EPCM contractor involved developing a large gasoline blending and jet fuel storage facility and 60km long pipeline in the UAE.



For the Total lube oil blending plant in the UAE we provided EPCM services.



LNG facilities

For many years LNG has been the fastest growing segment of the natural gas market and the long term demand for this means of supplying gas looks set to challenge producers, engineers, project developers, financiers and national and local governments well into the future.

We deal with all aspects and all phases of LNG developments from gas gathering and trunkline feed infrastructure, through liquefaction and regasification plants and resultant power development and distribution systems. Our involvement at the earliest possible phase of major projects liaising with potential stakeholders including governments, developers, lenders and major gas field owners means we often influence interrelated investment decisions. Following project sanction we can design and engineer all aspects of an LNG development.

In recent years we have been particularly active in evaluating the feasibility of proposed regasification terminals, considering technical, environmental, safety and regulatory perspectives, as well as economic and market aspects.

EPCM/PMC services

Mott MacDonald undertook a technical audit and strategic options study for this refinery in southern Africa.



We undertake a significant amount of detailed design and procurement work as the engineering sub-contractor to, or partner with, major EPC contractors.

We also offer our clients project facilitation services and support as a managing contractor, providing services in project management, design, procurement, logistics, inspection and construction supervision. Our energy specialists take full responsibility for the construction of new plant or upgrading of existing facilities, either managing manufacturers and contractors on behalf of a developer or taking the turnkey contractor role for projects within our risk envelope. We're also enthusiastic in developing partnering relationships offering improved effectiveness based on the principles of mutual benefit.



We were project management consultant for the Mina Al Fahal to Sohar crude oil pipeline project in Oman.

Refinery development

Refinery projects are normally large billion dollar developments centred around the core refinery process units. We've been involved in all stages of refinery development from the earliest concept development stage working with developers, financial institutions and national or local government agencies. Our specialist team offers the complete suite of ancillary services including the traditional petroleum industry related disciplines. And with our wider Group expertise we can also design and engineer jetties, tank farms, power systems, telecommunications, buildings, roads, tunnels, bridges and railways.

Mott MacDonald – multisector, multiskilled, multinational

Buildings

Communications

Construction economics

Education

Water

Environment

Health

Industry

Management consultancy

Planning

Project finance

Project management

Transport

Urban regeneration

Energy

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