

OIL AND GAS



Australian Government
Australian Trade Commission





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EXPERIENCE, INNOVATION AND PROVEN SOLUTIONS

Image courtesy of Woodside Energy Ltd



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Since the 1965 drilling of the first offshore well in Bass Strait, to the modern coal seam gas boom in Queensland, Australia's oil and gas industry has delivered enormous benefits in the form of export earnings, domestic economic activity, employment and investment. It has also created and sustained a globally respected and innovative technology, services and manufacturing sector.

Australia's oil and gas service and supply companies have been at the forefront of the industry's efforts to deal with remoteness, inherent technical challenges and risks, and mounting environmental and social pressures.

Australian companies have developed expertise across drilling technologies, geophysics software, pipeline construction materials and methods, engineering and design, and geotechnical engineering and assessment, as well as advanced safety training, rehabilitation and facility management.

This industry capability statement provides an overview of Australian capability in the oil and gas sector, including examples of some of the many Australian companies with specialist expertise.

Talk to your local Austrade representative for more tailored advice and information about connecting and partnering with the Australian oil and gas industry.

Image courtesy of Woodside Energy Ltd



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Australia produces energy for its own use, and exports for consumption overseas.

According to the Office of the Chief Economist, over the 10 years to 2013–14 Australian primary production grew at an average rate of 1.1 per cent per year. Total primary energy production in Australia in 2013–14 was 18,715 petajoules, around three times larger than domestic consumption. Net exports (exports minus imports) accounted for 72 per cent of production.

Over the past decade, Australian gas production has expanded by an average of 5 per cent a year, reaching 2,587 petajoules of natural gas in 2014-15, supported by the start-up of the Queensland Curtis LNG project. In 2014–15 Australia's crude oil and condensate production declined by 5 per cent to average 19 giga litres, reflecting a long term downward trend in declining production from mature liquid petroleum fields.

New and existing developments in several regions around Australia have already created thousands of jobs in the local oil and gas industry, and this is likely to continue over the next few decades.

Australia also has substantial shale gas reserves, such as in the Perth, Canning, Cooper and Maryborough basins, which offer potential for development in coming years.

BASS STRAIT, VICTORIA

In 1965 Esso/BHP joint venture drilling discovered the Barracouta gas field in Bass Strait. Two years later, Kingfish, the first offshore oil field, was found. It is still the largest oil field discovered in Australia. Billions of dollars worth of infrastructure has been built to develop, produce and process the crude oil and gas from these and other major discoveries in Bass Strait, off Victoria's Gippsland coast. The energy produced has been used to power industry, fuel vehicles and manufacture products in Australia and overseas.

Today there are 23 offshore platforms and installations in Bass Strait, including the new Marlin B platform and Kipper subsea wells, which feed a network of 600 kms of underwater pipelines. More than four billion barrels of crude oil and around eight trillion cubic feet of gas have been produced and the fields are predicted to supply energy for decades to come.

WESTERN AUSTRALIA

In Western Australia, the North West Shelf's modern gas boom effectively started with first-phase development of facilities in 1980. First domestic gas deliveries began in 1984. The North West Shelf Project is today Australia's largest oil and gas resource development, with further growth expected. Some 92 per cent of the gas reserves feeding Australia's multi-billion-dollar liquefied natural gas (LNG) sector are located off the Western Australian coast in the Bonaparte, Browse, Carnarvon and Perth Basins.

Since 1989, when the first LNG cargoes were shipped from the North West Shelf, Australia has produced more than 350 million tonnes of LNG. Production from the region accounts for one per cent of Australia's gross domestic product per year and contributes more than A\$5 billion a year in state and federal taxes and royalties.

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LNG production from the North West Shelf grew about 10 per cent a year to 2012, but with projects currently under construction this rate could climb to 20 per cent per year from 2020. Some projections indicate Australia's share of global LNG supply is set to grow from about 8 per cent to more than 25 per cent.

This success has been achieved by overcoming many technical and other challenges.

More than 80 per cent of Australia's gas resources exist in deep, remote, offshore areas. Developing the full potential of these remote resources has relied – and continues to rely – on advances in exploration, infrastructure and project development, transportation and maintenance.

Western Australia's oil and gas industry is supported by state-of-the-art local engineering and design, geophysics, and electrical and process engineering services and expertise. The service sector has demonstrated and exported advanced front end engineering and design (FEED), subsea technology and asset management capabilities.

Western Australia has also become an important global centre for offshore LNG industry research, education and training, through a variety of collaborative ventures and projects such as the Australian Centre for Energy and Process Training (ACEPT) at the Australian Marine Complex in Western Australia.

SOUTH AUSTRALIA

The Cooper Basin in central Australia has been a focal point for oil and gas exploration and development in South Australia since the first hydrocarbon discovery there in 1963. The formation of Geosurveys of Australia and Santos in March 1954 were important for local petroleum exploration locally and brought a revised approach to exploration thinking. By the early 1980s the Moomba gas processing facilities were regarded as a 'Vital National Installation'.

QUEENSLAND

Eastern Australia has very large reserves of coal seam gas (CSG) in high-permeability reservoirs that can deliver gas to the well-bores faster than coal reservoirs elsewhere.

CSG projects in Queensland are now playing a major role in Australia's energy sector and Queensland has been a pioneer in using coal seam gas to produce LNG. In January 2016 Australia Pacific LNG successfully completed the first export cargo shipment of liquefied natural gas from its new Curtis Island LNG facility, offshore from Gladstone, in Queensland. This is fed from the Bowen and Surat Basin which now has a tapped capacity of 25.3 million tonnes of LNG per year. More than A\$200 billion of new investment is proposed in LNG and CSG developments in Western Australia and Queensland alone.

NORTHERN TERRITORY

As part of the Ichthys project in the Browse Basin off Western Australia, Darwin will be the location for an onshore LNG processing plant. Gas from the Ichthys field will be transported from the offshore central processing facility (CPF) to the plant via an already completed 885km subsea pipeline. When completed Ichthys is expected to produce 8.9 mt LNG per annum, 1.6 mt liquefied petroleum gas (LPG) and 100,000 barrels condensate per day at peak.

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INNOVATION

A number of industry trends have opened up development opportunities for Australian designers and engineers, manufacturers and technology companies. Australian oil and gas companies are pioneering innovations in floating LNG, as well as coal-seam gas and advanced subsea geotechnics in extreme marine environments. Australia is also home to one of the world's leading collaborative research organisations focused on carbon dioxide capture and geological sequestration, the Global Carbon Capture and Storage Institute.

Floating production systems

Floating production systems will be of increasing importance to offshore oil and gas development, giving access to resources that would otherwise remain untapped because of distance from land.

Australia is likely to be the first country where floating LNG facilities are deployed, using a workforce capable of operating the next-generation vessels. The operations and maintenance phases of these projects are contributing to an emerging skilled workforce in floating production, storage and offloading (FPSO) and floating LNG (FLNG).

Specialised engineering capabilities

Other areas of innovation include improving construction productivity, safety enhancements, computational geosciences and subsea production. Oil and gas projects are becoming increasingly complex as the need increases to search for new resources in more hostile environments. Similarly, cost and other pressures require the development of different technologies which affect engineering design requirements.

Australia has proven capacity and capability in process and chemical engineering; mechanical and piping engineering; electronic and instrument engineering; electrical and power engineering; IT and telecommunications; civil and infrastructure engineering; onshore; offshore and subsea structural engineering, and project management.

Australian companies have developed advanced tieback, flow assurance and foundation modelling technologies and design solutions, while local suppliers are recognised as offering world-class marine vessels and innovation.

SAFETY, REMOTE OPERATIONS AND ENVIRONMENTAL CONTROLS

Australian companies are recognised as leaders in innovation around safety, remote operations and environmental controls – knowledge that is increasingly in demand around the world.

According to the Australian Petroleum Production & Exploration Association (APPEA), injury rates in the domestic industry have declined despite a significant increase in industry activity and hours worked over recent years.

Australian firms with experience in security, safety systems and compliance have responded to increasingly stringent safety and environmental requirements on offshore projects. Chevron, ExxonMobil, Conoco Phillips and Shell all cite safety as the number one priority for their business, while 2015 Australian Petroleum Production and Exploration Association (APPEA) environment award winners Woodside Energy were recognised for their work and leadership in the field of environmental management.

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In announcing the award, APPEA said judges found Woodside had shown consistent excellence in environmental management. This included strategic planning, risk management, monitoring and evaluation.

Woodside's marine research projects have involved collaboration with a range of organisations, including universities, CSIRO, the Australian Institute of Marine Science (AIMS),

the Western Australian Museum (WAM), and the Western Australian Department of Parks and Wildlife.

Flagship research projects include the Scott Reef Maxima Seismic Survey and the Rankin Bank and Glomar Shoals Study.

Since 1993, Woodside (on behalf of its Browse joint venture partners) collaborated with AIMS on more than

40 scientific expeditions to the offshore atolls of the Kimberley. From 1998, Woodside and the WAM partnered in ground-breaking research on the marine biodiversity of the Dampier Archipelago and the waters off the Kimberley region for the Browse and Pluto projects, aimed at minimising the environmental footprint of hydrocarbon exploration and production.

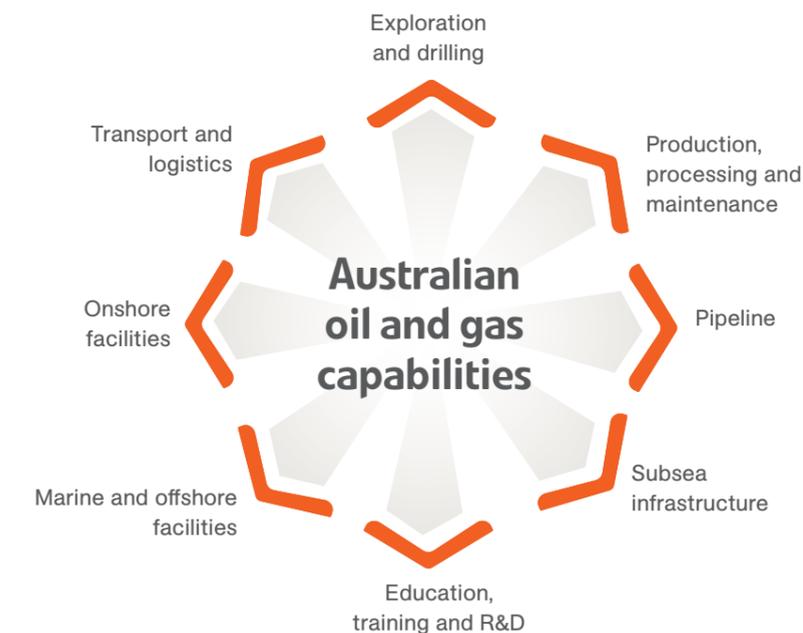


Diagram adapted from Teramar Consulting

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RESEARCH AND DEVELOPMENT

Australian centres of excellence and clusters of suppliers, researchers and tier one industry players are working together to provide an environment for innovation and commercialisation of new solutions and technologies. The Australian Government, industry and universities are fostering oil and gas industry Centres of Excellence in Australia (particularly in Perth), as a hub for deep offshore and FLNG operations and maintenance.

Sustainability

In 2011, industry and the science community came together in Queensland to launch the Gas Industry Social and Environmental Research Alliance (GISERA), a groundbreaking research alliance to support sustainable development of the coal seam gas industry.

Founded by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Australia Pacific LNG (a CSG to LNG joint venture between Origin and ConocoPhillips), GISERA's research focus over five years is in five key social and environmental areas:

groundwater and surface water, biodiversity, land management, the marine environment and socio-economic impacts.

The A\$14 million venture is initially aimed at Queensland's CSG-LNG industry but has potential to be expanded to cover gas sector developments in other parts of Australia.

LNG processing

CSIRO is also leading industry research into new ways to liquefy or transform natural gas so it is easier to use and transport. New generation gas-to-liquid processes are being targeted, with potentially significant implications for global use of the fuel.

Working with Australia's biggest gas producers, CSIRO research projects are aimed at developing, testing and demonstrating new catalysts to improve the efficiency of natural gas processing:

- making the conversion of natural gas to synthetic fuels and chemicals more economically feasible by developing processes that reduce plant size and cost

- improving gas separation technologies for oxygen, hydrocarbons and carbon dioxide for process efficiency improvements and greenhouse gas mitigation
- developing a concentrated hydrogen supply from gas-to-liquids processes for fuel cell and hydrogen economy applications
- researching plastics production from biologically-derived materials such as eucalyptus oil.

The work is also targeting new purification steps to produce cleaner LNG, potentially lowering processing costs.

CSIRO gas processing and conversion research facilities and laboratories are regarded as being unique in the South East Asia region. The organisation has also built Australia's first synthetic fuels research facility. While automated, the plant is seen as an ideal training ground for the gas processing industry.

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Pipeline technology

In response to the global trend for deep water and offshore oil and gas developments, Australia is focusing energy sector research collaborations on pipelines.

Building a pipeline system to link an offshore oil and gas field to the mainland represents a huge capital investment.

Today the cost per kilometre of current pipeline projects, including Gorgon (water depth: 1350m/length: 65-140km), Scarborough (900m/280km), Pluto (830m/180km) and Browse (600m/up to 400km) is estimated to exceed A\$4.5 million per kilometre.

With over 2,000km of pipelines under design in Australia, capital expenditure could exceed A\$10 billion.

Pipeline research

The need to maintain the structural integrity of offshore pipelines to safeguard continuous supply of products across hundreds of kilometres of seabed – and also to ensure the economic viability of these vital transportation arteries – has led to the development of cutting-edge R&D and technical solutions now being applied around the world.

These solutions for Australia's offshore pipelines are considered essential for achieving 'platform free fields' (a CSIRO Production technologies research initiative csiro.au/en/Research/EF/Areas/Oil-gas-and-fuels/Offshore-oil-and-gas/Flow-assurance), where subsea technologies replace traditional oil and gas platforms in the production of gas from resources up to 300km offshore, at depths exceeding 1km.

Six Australian universities (The University of Western Australia, Curtin University of Technology, The University of Queensland, Monash University, The University of Sydney and Flinders University) and CSIRO came together in 2008 to establish the Subsea Pipelines Collaboration Cluster.

Based in Western Australia, its aim was to provide engineering solutions for safe and economic design and operation of subsea pipelines in Australia's offshore frontiers. The work resulted in significant advances in the understanding of subsea pipeline technology.

Key achievements include establishing new numerical models and software for analysing the stability of offshore pipelines, novel methodologies for economic and safe pipeline design, and the commissioning of world-class experimental and pipeline testing facilities. These have spawned specialist testing and consultancy services for the offshore pipeline industry.

Results from the cluster's research have been incorporated into new generation subsea natural gas projects such as the Gorgon project in north-west Western Australia. The final reports of the Subsea Pipelines Collaboration Cluster are available from the University of Western Australia's Centre for Offshore Foundation Systems www.cofs.uwa.edu.au/publications

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The sophisticated equipment and pipeline testing methods developed by the cluster have underpinned designs for other new pipelines in Australia, while the same technologies have also been used on projects elsewhere in the world, such as BP's PSVM field off Angola, the West Nile Delta off Egypt and Shah Deniz in the Caspian Sea.

The cluster's research outcomes are contributing to future research priorities of the CSIRO, universities and industry partners in the areas of pipeline design and installation in Australian calcareous soil conditions and in deep-water. Outcomes also inform geohazard risk assessment and the use of automated underwater vehicles.

Leading energy company Chevron established its Perth Global Technology Centre in 2007, choosing the location for its proximity to talented regional technology experts and opportunities to pursue research and development alliances with universities and industry partners.

The Centre provides research and development services and integrated technology solutions in areas such as process safety, environmental stewardship, LNG processing, subsea engineering, technical geophysics, exploration, reservoir management,

enhanced oil recovery and deepwater operations. It has developed new seismic processing technologies that enable oil and gas reservoirs to be found at greater depths and in more geologically complex situations.

A combination of state-of-the-art imaging, analysis and computing technologies has enabled Chevron to locate and economically develop reservoirs in hitherto inaccessible locations such as the sub-salt Tahiti field in the deep-water Gulf of Mexico – a 500 MMboeg field 6km below the waters of the Gulf of Mexico.

A groundbreaking solution, using advanced technologies in riser materials, design, and manufacturing, was developed to meet operating constraints in the Agbami field in Nigeria, a deep-water field in 1524m of water. Significant flow assurance and temperature and pressure challenges had to be overcome to enable the project to deliver crude oil from the subsea wells to the host facility successfully and safely.

Subsea research

Industry and government-funded research in Western Australia is making a global difference in other areas of oil and gas exploration.

Work at the Centre for Offshore Foundation Systems (COFS) is equipping both geoscientists and offshore engineers with a better understanding of the challenges posed by differing subsea conditions.

The centre, which has become the largest international subsea research organisation of its kind, was originally established to investigate the unique composition of seabeds on the North West Shelf and address the shallow water challenges then faced by the subsea industry. Its sophisticated modelling and applied research has improved the way offshore infrastructure is designed and has influenced the design of subsea pipelines around the world.

The specific findings from the centre support new design approaches which have been written into international standards such as the widely used SAFEBUCK Guideline.

Image courtesy of Matrix Composites & Engineering



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A collaboration between the centre, the Minerals and Energy Research Institute of Western Australia and six oil and gas industry partners led to the improvement of pipeline hazard modelling software which can identify the impact of submarine landslides on subsea pipelines, allowing better assessment and mitigation of risk.

The centre also developed new techniques to investigate and characterise unusual geological conditions found on the seabed in deep water. The tools have been widely adopted by industry in Australia and overseas.

COFS centrifuge and soil characterisation facilities and an 'O-tube simulator' in the School of Civil and Resource Engineering at the University of Western Australia continue to advance seabed science in support of industry.

The centre is the only one of its kind in Australia and the only testing and modelling facility in the southern hemisphere to have both a beam and drum centrifuge.

Able to reproduce the behaviour of complex seabed sediments, UWA's centrifuge facilities support industry with geotechnical design for structures such as pipelines, anchors, foundations and jacket foundations. The facility supports leading research into offshore foundation systems, including the mechanics of seabed sediments, geo-hazards and seabed mobility, and pipeline and deep water offshore engineering.

Unique in the world, the giant O-tube simulator creates cyclonic conditions in a controlled experimental environment, demonstrating how seabed sediment and pipelines interact during storms. The facility supports industry to improve pipeline designs – promoting safety, reducing risks such as pollution, and optimising infrastructure investment.

The CSIRO and WA Government-backed North West Shelf Joint Environmental Management Study (NWSJEMS) continues to influence planning and project development around the world.

The study tackled the complex issue of how human activities on Australia's marine and coastal environment can be managed, to deliver social and economic benefits, while maintaining environmental integrity. It delivered the world's first practical, objective way to support planners in imagining, evaluating and choosing between different development scenarios and management options.

Results of the NWSJEMS have been documented in a series of technical reports and the work has produced a new generation of management strategy evaluation models.

Modelling advances have also strongly influenced the development of a range of other ecosystem models currently being applied throughout Australia, the Antarctic, the west coast of the USA, and Mexico. The web-based Data Trawler developed by NWSJEMS is now the standard tool for online identification and retrieval of marine data held by CSIRO.



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EDUCATION AND TRAINING

The development of skilled labour and advanced skills in areas such as engineering and geoscience is critical to efforts to improve productivity, not just in Australia but other key resource-developing areas around the world.

The Subsea Pipeline Collaboration Cluster has trained more than 40 offshore engineers and researchers for the benefit of the offshore oil and gas industry through its PhD and postdoctoral programs.

Technological breakthroughs such as FLNG are part of a much broader set of solutions.

Western Australia's Centre for Offshore Foundation Systems (COFS) is another focused on skilling the next generation of engineers through the training of PhD students. It says many of its graduates have remained in the state to contribute to the local engineering expertise that is building the next generation of offshore resource projects.

The newly created Woodside Professorship in Computational Geoscience at The University of Western Australia is part of a five-year program to establish the state as a world centre of excellence in geoscience. An alliance between UWA and Woodside will work to develop new computational geoscience research aimed at improving understanding of North West Shelf energy resources.

Computational geoscience, and seismic imaging in particular, allows exploration companies to make three-dimensional models of the earth's structure to aid discovery targeting. Models can also be used to assess geological suitability for carbon geosequestration projects, and quantify natural hazards such as earthquakes, tsunamis and landslides.

'Substantial productivity improvement in LNG will make a tangible improvement to the economy...The biggest drivers to improve productivity are to reduce the time needed to build a new LNG plant, and to reduce the costs of doing so.'

McKinsey Institute, 2012

Image courtesy of ACEPT



Woodside Energy continues to set records

Case study: offshore installation

Woodside Energy, Australia's largest independent oil and gas company, produces some 900,000 barrels of oil equivalent each day and has been operating its landmark Australian project, the North West Shelf (NWS), for almost three decades. It remains one of the world's premier liquefied natural gas (LNG) facilities.

The North Rankin Redevelopment Project (NRB), an essential extension of the NWS business, is an example of Woodside's project development capabilities. A major undertaking on a global scale and one of the most complex developments Woodside had ever undertaken, the A\$5 billion project is aimed at recovering low pressure gas from the North Rankin and Perseus gas fields.

Successful use of the float-over method at NRB enabled Woodside to set a new installation record with 24,000-tonne topsides placed on the jacket in open water. The record related to weight and height of the topsides.

Woodside completed piling of the NRB jacket early in 2012, followed by installation of production and pedestrian bridges connecting North Rankin A and North Rankin B platforms. After installation of the topsides, hook-up and commissioning activities commenced.

The 260 metre-long Heerema H-851 barge, the largest oil and gas industry transport barge in the world, was used to transport and install the topsides on the platform's substructure. The topsides were positioned 100 metres from the North Rankin A production facility and were installed using the float-over method.

Detailed analysis, disciplined planning, extensive risk analysis, rigorous attention to detail and a commitment to teamwork saw the NRB team safely deliver this project.



Image courtesy of Woodside Energy

Advanced Geomechanics offers solid expertise for challenging environments

Case study: consulting

Advanced Geomechanics, now part of Fugro's global GeoConsultancy practice, has established a world-leading oil and gas industry consultancy on Australia's unsteady calcareous seabeds.

Major geotechnical challenges found in developments on the North West Shelf of Australia in the 1980s and 1990s highlighted unexpected ground conditions affecting the first two large manned platforms at North Rankin and Goodwyn.

The local and global industry soon recognised the engineering challenges posed by the calcareous sediments around Australia, especially combined with extreme cyclonic weather. A Centre of Excellence at the University of Western Australia has since become the Centre for Offshore Foundation Systems. Central to its development was Professor Mark Randolph, supported by Professors Martin Fahey and John Carter.

Professors Randolph, Fahey and Carter joined other geotechnical experts at Advanced Geomechanics, established in 1994 and now a globally recognised leader in the design of foundations and anchors in calcareous seabeds. AG has a team of more than 50 geoscientists, most with multiple qualifications in specialist areas and unparalleled experience in the field. The specialist team has worked on hundreds of projects around the world.

Technical Director Carl Erbrich says AG has continually responded to industry needs. 'Since inception we have acquired the brightest talents to meet the demands of industry and this approach has been, and still is, central to AG's success.'

Recent consulting work includes projects throughout South-East Asia, the Gulf of Mexico, the North Sea, and the Middle East.

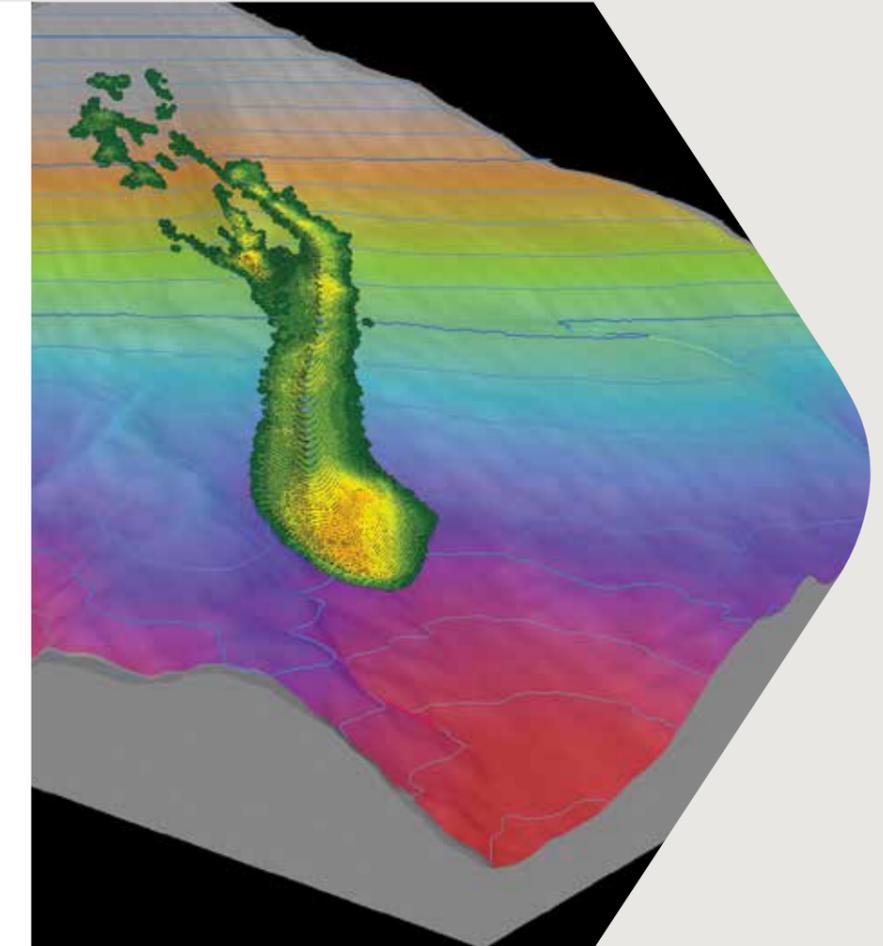


Image courtesy of Advanced Geomechanics

ACEPT trains a new generation of skilled operators

Case study: training

The resources sector has created huge demand for skilled process operators in Australia and internationally.

Challenger Institute's Australian Centre for Energy and Process Training (ACEPT) provides nationally accredited qualifications for the Australian oil and gas, mineral and chemical processing industries. It is regarded as one of the leading chemical, hydrocarbons and oil refining process operations training centres in the Asia-Pacific region. ACEPT's training facility is in the Australian Marine Complex, near Perth in Western Australia.

Developed through collaboration between industry and state and federal governments, and led by an industry management board comprising representatives from leading companies, ACEPT was founded to respond to industry growth and the resulting need for greater numbers of highly skilled workers.

With state-of-the-art equipment and facilities delivered through A\$21 million of government funding and highly experienced training staff embracing industry-responsive training concepts, ACEPT works closely with resource industry company specialists to ensure the centre is a leader in training delivery. Its services span government-funded and fee-for-service programs tailored to client needs.

Its advanced training facilities include a fully operational closed-loop process train that separates nitrogen from air for use in the separation process, separates oil from water, stores the individual chemicals, and recombines the chemicals for the next training program. Other facilities include process controllers supplied by Honeywell, a full-scale simulation of the process train developed by Honeywell, and a Yokogawa simulation of a distillation tower, instrument air, furnaces and heat exchangers.



Image courtesy of ACEPT

Clough offers a century of expertise

Case study: engineering, construction and asset support services

Clough, established in Western Australia in 1919, diversified its services into civil and heavy engineering contracting in the 1950s and entered the oil and gas sector in the 1960s.

It provides engineering, construction and asset support services to some of the world's most challenging energy and resource projects in Australia and Papua New Guinea, where significant growth is predicted in the LNG export market over the next decade.

In 2013 Clough teamed with a Korean oil and gas manpower and logistics firm, Coens Energy, to form Clough Coens Commissioning and Completions, an incorporated joint venture providing highly specialised commissioning and completions services to onshore and offshore oil and gas facilities, including drilling rigs and fabricated process equipment manufactured in Korea and China.

Clough Coens' project management and execution service enables oil and gas facilities to be commissioned in the fabrication yard, with hook-up and commissioning services then performed in the final location.

The joint venture opened up access to an international talent pool of more than 6,000 technical and trades commissioning personnel, enabling Clough Coens to rapidly mobilise teams of specialised commissioning personnel onto projects.

Coens' strong relationships with key Asian fabrication yards and major oil and gas operators also afford leverage, with the group having supplied manpower services to the three largest oil and gas fabrication yards in the world.



Image courtesy of Clough

Wilson Transformer Company – a tradition of reliability and innovation

Case study: equipment manufacturing

Victorian-based manufacturer Wilson Transformer Company (WTC) has specialised in transformer engineering and manufacturing since it was founded in 1933. Now run by the founder's son, Robert Wilson, WTC supplies its products to customers in Indonesia, Malaysia, Saudi Arabia, the UAE, the UK, New Zealand and numerous other countries. Exports represent more than 10 per cent of WTC's annual sales.

'We have earned an enviable international reputation for quality, reliability and service. We are continually enhancing our products to achieve superior lifetime performance and competitiveness,' Robert Wilson says.

By working collaboratively with its customers and applying its decades of experience and know-how in engineering, manufacturing and logistics, WTC is able to innovate and propose original transformer and substation solutions.

'We are flexible in our approach,' Wilson says. 'We can provide total solutions designed for today's business environment,

which increasingly requires supply chain management, predictive management and condition-based maintenance'.

WTC operates specialised manufacturing operations at two locations in Australia, producing a comprehensive range of power and distribution transformers, up to 250 MVA, to standard and custom designs. The company also manufactures internationally via joint ventures with EWT Wilson Transformer Sdn Bhd, Malaysia and United Transformer Electric Company (Utec), Saudi Arabia, making high-quality distribution transformers and compact substations.

Dynamic Ratings, a WTC subsidiary, produces the DRMCC (Dynamic Rating, Monitoring, Control and Communications) System, an integrated microprocessor-based monitoring and control system for power transformers.

A joint venture laboratory was also formed in 2001 with US-based TJH2b Analytical Services Inc, world leaders in oil analysis and diagnostic technology.



Matrix Composites rises to the challenge

Case study: equipment manufacturing

When a major international equipment supplier sought to keep equipment identical between their new and old drill-ships and negate the need for a large investment in spare risers, Australia's Matrix Composites & Engineering had the solution.

Matrix's client ordered a number of rigs capable of drilling in 12,000 feet of water. With a large existing fleet of rigs rated to 10,000 ft and more than 100,000 ft of existing riser, the company wanted as much equipment as possible to be interchangeable between the new and older drill-ships.

The existing rigs had 60.5" rotary tables, each with buoyancy with a maximum diameter of 54". These needed greater uplift to deploy 12,000 ft of riser and the company was told it would need 58" buoyancy. While the new rigs would have a 75" rotary table and could deploy the larger diameter, it could not be used on the older rigs.

Matrix optimised the design of the riser buoyancy to obtain the largest possible uplift required for 12,000 ft.

The A\$36 million of riser buoyancy modules supplied for the new-build 12,000 ft drill-ships used premium ultra-light syntactic foam systems so Matrix could manufacture a product that gave the uplift of the larger diameter buoyancy while staying within the 54" OD parameter.

The solution also allowed the Korean shipyard to use the same derrick and tensioner system as the 10,000 ft rigs, thereby containing the overall cost of the project.

Established in 1999, but with operations dating back to 1980, Matrix Composites & Engineering has gained a global reputation for subsea buoyancy systems and advanced engineered products for well construction, subsea umbilicals, risers and flowlines (SURF) and cryogenic insulation systems for LNG applications.



Image courtesy of Matrix Composites & Engineering

GPT drills down to the deep data

Case study: software

Genesis Petroleum Technologies (GPT), an Australian company based in Perth, has been providing data analysis services to Petrobras through its Brazilian agent for the last seven years.

Successful application of this knowledge management software in the deepwater Campos Basin led to its use in the Brazilian sub-salt fields, whose wells are among the most complex developments in today's oil and gas industry.

'Sub-salt' refers to an area located off the Brazilian coast where the reservoir was created prior to a layer of salt forming up to 2,000 metres thick. The distance between the surface of the sea and the oil reservoirs under the salt layer can be up to 7,000 metres.

Originally developed by the CSIRO, Genesis is a system and software package that allows easy and comprehensive analysis of drilling and completions operational data.

Genesis helps in the development life-cycle in the continuous improvement of planning well operations process. It offers companies a systematic way to analyse and benchmark results and use historical data, comprehensive data preparation and statistical analysis in order to plan time and cost for future wells.

Currently Petrobras uses several Genesis products to plan new well campaigns in a five-year timeframe and to plan and follow up detailed operations for each well. During this entire cycle of Front-End Loading stages, Genesis products help Petrobras understand operational performance and benchmarking, and follow several KPIs to keep management and operational teams informed.



Image courtesy of Woodside Energy Ltd



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The following table provides some examples of companies and their capabilities.

Contact your local Australian Trade Commission representative for assistance with connecting with the Australian businesses that best suit your requirements.

Company name A – E	Engineering procurement construction	Engineering services	IT/Communications	Drilling	Electrical/power	Environmental	Gas treatment/processing/compression/storage/monitoring	Geophysical	Health and safety	HVAC	Instrumentation/control	Marine	Maintenance and repair	Pipes/pipelines	Production and processing	Well services	Subsea	Research and development	Training/education/risk management	Transport/logistics	Valves/pumps/fittings/accessories	Water treatment	
Add Energy	•	•		•	•				•						•	•							
Advanced Geomechanics							•				•		•				•						
AECOM Australia Pty Ltd	•	•			•		•	•			•		•		•			•	•				•
APTS (Australian Pressure Testing Services)						•			•				•								•	•	
Aqueous Solutions																						•	•
Atlas Copco Compressors Australia Pty Ltd						•					•												•
Australian Maritime Systems					•				•	•	•												
Australian Satellite Communications		•																					
Basetec Services Pty Ltd		•										•	•										
Binder													•	•								•	
BlueScope Distribution Pty Ltd	•					•						•	•									•	
Borealis			•																				
BTE (Baillie Tank Equipment)						•																	•
Challenger Institute of Technology																		•					
Clough	•	•			•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•
Clyde Bergemann Australia Pty Limited						•								•									
CQ Field Mining Services					•							•	•									•	
CS GAS Pty Ltd	•	•			•		•					•	•	•				•			•	•	
CSIRO																	•						
Datapod Pty Ltd			•																				
Direct Connection Safety								•										•					
e2o Pty Ltd		•										•											
Easternwell			•				•								•								
Ecco Consulting Pty Ltd																	•		•				
Eilbeck Cranes											•					•							
Enretech Australasia P/L					•		•		•	•													

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Company name E – L	Engineering procurement construction	Engineering services	IT/Communications	Drilling	Electrical/power	Environmental	Gas treatment/processing/compression/storage/monitoring	Geophysical	Health and safety	HVAC	Instrumentation/control	Marine	Maintenance and repair	Pipes/pipelines	Production and processing	Well services	Subsea	Research and development	Training/education/risk management	Transport/logistics	Valves/pumps/fittings/accessories	Water treatment	
ERGT									•												•		
Falck Pty Ltd									•												•		
Farley Riggs Pty Ltd		•													•								
Fibre Optics Design and Construct Pty Ltd			•																				
Fitzroy Engineering Australia	•	•					•						•										
Gasco Pty Ltd	•	•				•	•						•										
Gastech Australia Pty Ltd	•	•					•	•	•	•											•		
Genesis Petroleum Technologies			•	•																•			
GeoGAS							•	•	•														
GHD Pty Ltd	•	•	•		•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•
Great Western Manufacturing														•									
Hercules Offshore Lifting Gear Pty Ltd																					•		
Hero Engineering		•						•	•														
ICON Engineering Pty Ltd	•	•		•													•	•					
Imbros						•	•		•	•						•	•						
Industrial Gaskets						•							•	•	•	•	•					•	
Inflatable Packers International				•									•		•	•							
Intrepid Geophysics							•					•								•			
Jacks Winches Pty Ltd		•										•	•				•						
JobFit Systems International Pty Ltd			•						•											•			
Klinger Limited										•											•		
KMH Environmental		•				•							•	•							•		•
L-3 Oceania	•	•	•			•			•	•						•							
Lanotec Australia Pty Ltd			•	•	•		•				•	•	•										
Lazertek Australia																					•		
Lockforce																				•			

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Company name M – T

Company name	Engineering procurement construction	Engineering services	IT/Communications	Drilling	Electrical/power	Environmental	Gas treatment/processing/compression/storage/monitoring	Geophysical	Health and safety	HVAC	Instrumentation/control	Marine	Maintenance and repair	Pipes/pipelines	Production and processing	Well services	Subsea	Research and development	Training/education/risk management	Transport/logistics	Valves/pumps/fittings/accessories	Water treatment
LogiCamms Limited	•	•			•		•						•	•				•			•	•
Matrix Composites & Engineering			•								•	•	•	•	•	•						
Maloney Field Services					•													•				
Metocean Services International		•			•				•	•							•					
Northern Refueling Maintenance	•	•			•			•				•	•						•		•	
MPower Projects Pty Limited		•		•								•										
MRC Global						•			•		•	•	•	•	•		•				•	•
PECOFacet Australia Pty Ltd		•				•					•	•	•								•	
Penske Power Systems Inc	•											•									•	
OMS Oilfield Services (Australia) Pty Ltd												•										
Osmoflo Pty Ltd																						•
Ozcon Industries Pty Ltd													•								•	
Pacific Hoseflex		•	•										•								•	
Peak Well Systems Pty Ltd															•							
Rigvids								•											•			
Safemate Anti-slip Pty Ltd		•						•				•										
SGL Systems International Pty Ltd	•								•		•											
Simmonds & Bristow		•			•														•			•
Spatial Solutions Pty Ltd					•		•				•	•	•			•				•		
Steel Blue Safety Footwear								•														
Subcon Technologies Pty Ltd		•															•	•				
Swivelpole tm					•			•				•										
TCA Partners Pty Ltd								•											•			
The Omega Group	•		•		•	•						•										
Thermal Electric Elements Pty Ltd	•	•	•	•	•		•		•			•	•									
Transco Oilfield/ Stealth Tools		•	•									•			•							
Truscott Crisis Leaders								•											•			

The following table provides some examples of companies and their capabilities.

Contact your local Australian Trade Commission representative for assistance with connecting with the Australian businesses that best suit your requirements.

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Company name U – Z

Company name	Engineering procurement construction	Engineering services	IT/Communications	Drilling	Electrical/power	Environmental	Gas treatment/processing/compression/storage/monitoring	Geophysical	Health and safety	HVAC	Instrumentation/control	Marine	Maintenance and repair	Pipes/pipelines	Production and processing	Well services	Subsea	Research and development	Training/education/risk management	Transport/logistics	Valves/pumps/fittings/accessories	Water treatment
Ulbrich Products Pty Ltd	•					•							•			•					•	•
UTi (Australia) Pty Ltd																				•		
Velrada Capital Pty			•																•			
Vigil Antislip									•													
Vipac Engineers & Scientists Limited		•	•			•		•	•							•		•				
Weir Minerals Australia	•					•															•	
Westlink Logistics																				•		
Westralian Engineering	•	•									•	•	•								•	•
Wilson Transformer Company					•																	
Wintech Engineering													•								•	
Wood Group Kenny	•	•											•			•						
Worksafe Environments						•		•	•		•		•									
WorleyParsons	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
WPM Health								•														
ZZ Resistivity Imaging							•															

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The following are some of the government and industry bodies involved in the Australian oil and gas industry.

Contact your local Austrade representative about connecting and partnering with the Australian oil and gas industry.

austrade.gov.au

GOVERNMENT BODIES

The Department of Industry, Innovation and Science is responsible for policy and programs in support of Australia's manufacturing, services, resources, and energy sectors.

industry.gov.au

Geoscience Australia is Australia's national geoscience agency and exists to apply geoscience to Australia's most important challenges. ga.gov.au

Office of the Chief Economist is an economic research unit within the Australian Government Department of Industry, Innovation and Science. industry.gov.au/Office-of-the-Chief-Economist

The National Offshore Petroleum Safety and Environmental Management Authority is a Commonwealth Statutory Agency regulating the health and safety, structural integrity and environmental management of offshore petroleum facilities. nopsema.gov.au

STATE GOVERNMENT CONTACTS

New South Wales - NSW Trade & Investment industry.nsw.gov.au

Northern Territory - Invest NT investnt.com.au

Queensland - Trade & Investment Queensland tiq.qld.gov.au

South Australia - Invest in South Australia statedevelopment.sa.gov.au

Tasmania - Invest Tasmania stategrowth.tas.gov.au

Victoria - Invest Victoria invest.vic.gov.au

Western Australia - Department of State Development dsd.wa.gov.au

INDUSTRY ASSOCIATIONS

The Australian Petroleum Production & Exploration Association (APPEA) is the national body representing Australia's oil and gas exploration and production industry. appea.com.au

Subsea Energy Australia (SEA) is a not-for-profit industry association aimed at championing Australian subsea industry capabilities to the wider regional & global markets. subseaenergyaustralia.com

The Petroleum Club of WA is an industry network and educational resource for the oil and gas sector. petroleumclub.org.au

The Australian Marine Complex (AMC) is a world-class centre for excellence for manufacturing, fabrication, assembly, maintenance and technology servicing the marine, defence, oil and gas, and resource industries. australianmarinecomplex.com.au

Industry Capability Network (ICN) is a business network that introduces Australian and New Zealand companies to projects large and small. icn.org.au

Oil & Gas Australia magazine provides coverage of developments in the Australian petroleum sector. It is recognised by leading global petroleum companies, industry and government bodies as a reference tool on oil and gas activity in the southern hemisphere. energy-pubs.com.au/oil-gas-australia

Engineers Australia works to develop, promote and support professional development of engineers, including engineers in the oil and gas sector. engineersaustralia.org.au

The Society of Petroleum Engineers aims to collect, disseminate, and exchange technical knowledge concerning the exploration, development and production of oil and gas resources, and related technologies for the public benefit, and to provide opportunities for professionals to enhance their technical and professional competence. spe.org



Image courtesy of Woodside Energy Ltd

The Australian Trade Commission – Austrade – contributes to Australia's economic prosperity by helping Australian businesses, education institutions, tourism operators, governments and citizens as they:

- develop international markets
- win productive foreign direct investment
- promote international education
- strengthen Australia's tourism industry
- seek consular and passport services.

Austrade helps companies around the world to identify and take up investment opportunities in Australia as well as to source Australian goods and services.

Our assistance includes:

- providing insight on Australian capabilities
- identifying potential investment projects and strategic alliance partners
- helping you to identify and contact Australian suppliers.

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