

ENERGY COUNTRY REVIEW

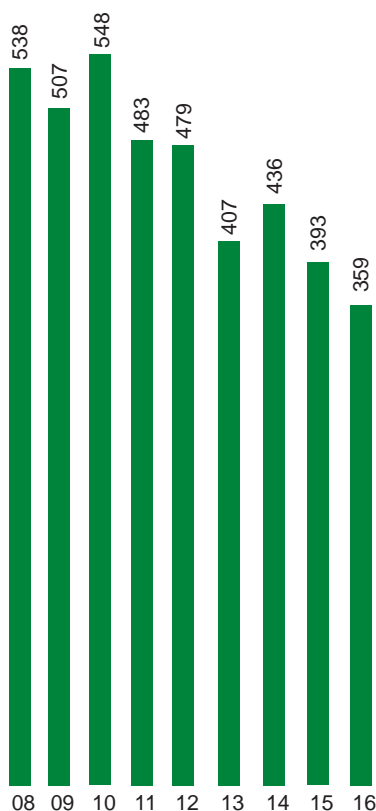
Australia

keyfactsenergy.com

Country Review Australia

Australia Oil Production

Thousand barrels per day



Source: BP Statistical Review

The first British settlement of Australia began in 1788 and six Crown Colonies were eventually established which federated in 1901.

These six colonies managed affairs while still part of the British Empire and in 1901 they federated with the Federal Capital Territory (ACT) formed in 1911 to house the capital in Canberra. The birth of the nation proper is recognised as defeat of the ANZACs at Gallipoli in World War 1 and Britain had ended most constitutional links by 1942. After World War 2 the country encouraged immigration from Europe and, later, from Asia. The Australia Act of 1986 severed all ties with the UK but voters rejected a proposal to become a republic. Australia's economy is strong, focused on mining, energy and services.

Oil & Gas

Oil production began onshore in 1924 in Victoria, in a small part of the Gippsland Basin. However, most onshore oil and gas comes from the Bowen/Surat and Cooper/Eromanga Basins in Queensland and South Australia, including methane deposits associated with coal.

The offshore part of the Gippsland Basin became the country's main producing area when output from here began in 1969. It has been taken over by production from the shallow and deep water basins of the NW Shelf in Western Australia and Northern Territory where oil, NGLs and, in particular, gas have growing contributions. Gas fields serve a broadening indigenous pipeline market and a rapidly expanding LNG export capacity.

Geography

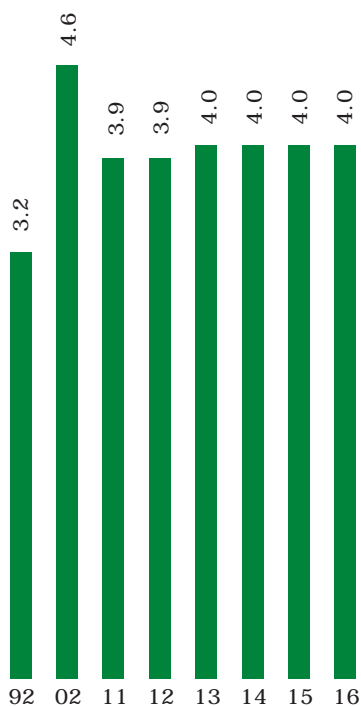
Australia is part of the Indo-Australian Plate. It is separated from Asia by the Arafura and Timor Seas. The Coral Sea lies off the Queensland coast and the Tasman Sea between

Country Key Facts

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|---------------------|--|
| Capital: | Canberra |
| Population: | 24 546 779 (2016) |
| Area: | 7,692,024 km ² / 2,969,907 sq miles |
| Form of government: | Federal democratic administrative authority |
| Religions: | Protestant, Roman Catholic |
| Currency: | Australian dollar (AUD) |
| Calling code: | +61 |

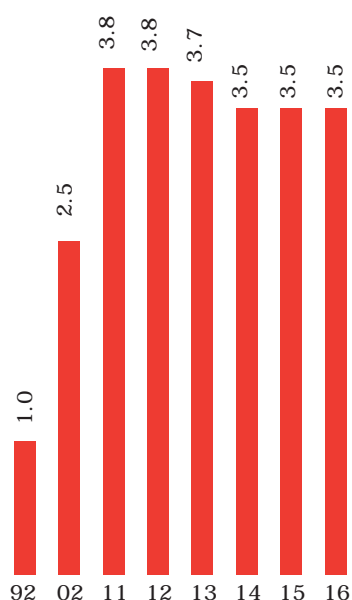
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Australia year end proved oil reserves Billion barrels



Source: BP Statistical Review

Australia year end proved gas reserves Trillion cubic metres



Source: BP Statistical Review

Australia and New Zealand. The Great Barrier Reef, the world's largest reef, is off the northeast coast, extending over 2,000 kms.

Australia has a variety of landscapes, with tropical rainforests in the northeast, mountain ranges in the southeast, southwest and east, and desert in the centre (known as the outback).

Eastern Australia's coast is marked by uplands and grasslands adjacent to the Great Dividing Range which runs parallel to the coast. At 2,228m, Mount Kosciuszko on the Great Dividing Range is the highest mountain on the mainland. Inland of the mountains are large areas of grassland and in the northeast are rainforests of the Cape York Peninsula.

The landscapes of the north include rainforest and desert including in the northwest sandstone cliffs of The Kimberley and Pilbara. To the south of these lie more areas of grassland. In the middle of the country are uplands including Uluru (Ayers Rock), and inland deserts. The arid Nullarbor Plain lies on the southern coast.

Coal Bed Methane and Shale Gas

Australia has sizeable, untapped natural gas resources in the form of coalbed methane (CBM), known as coal seam gas in Australia, and shale gas. Commercial production from CBM, which began in 1996, rose to 424 Bcf in 2015, 50% higher than in 2014.

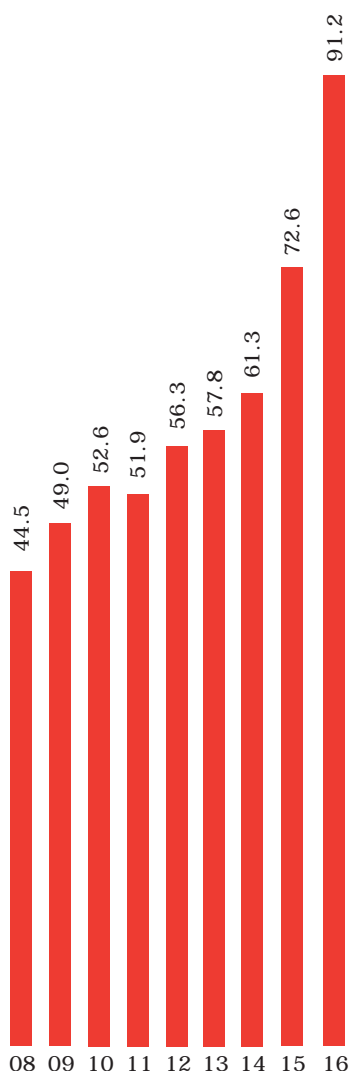
LNG exports

As a result of its abundant natural gas resources and its geographic proximity to consumer markets, Australia has become a leader of LNG supply for the Pacific basin. Over the past decade, Australian LNG exports have increased nearly three times, and they are expected to rise substantially in the medium term as developers usher in new upstream and liquefaction capacity. Australia became the second-largest LNG exporter in the world behind Qatar, surpassing Malaysia for the first time in 2015. Australia is poised to overtake Qatar as the world's largest LNG exporter by 2020 as capacity of its liquefaction terminals builds. Exports rose to 2.1 Tcf in 2016, up from about 1.4 Tcf in 2015.

Source: EIA, GlobalShift

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Australia Gas Production
Billion cubic meters



Source: BP Statistical Review

REGULATION

In Australia, upstream petroleum activities occur both onshore and offshore. Responsibility for Australia's offshore areas beyond three nautical miles from the territorial sea baseline rests with the Australian Government.

Responsibility for onshore petroleum operations and as far as three nautical miles seaward of the baseline (referred to as 'coastal waters'), is the responsibility of the state and territory governments.

The Department of Resources, Energy and Tourism provides the Australian Government with high-quality upstream petroleum-related policy advice and in cooperation with the states and territories, is the regulator of offshore petroleum activities.

Offshore petroleum operations beyond designated state and territory coastal waters are governed by the Commonwealth Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGSA) and related Acts and regulations. Within this legal framework, the Australian Government together with the State and the Northern Territory governments jointly administer the regulatory regime and supervise industry activities through a Joint Authority/Designated Authority arrangement.

The OPGGSA came into force in 2008 superseding and repealing the Offshore Petroleum Act 2006 (OPA) and the Petroleum (Submerged Lands) Act 1967 (PSLA). The OPA was firstly developed to replace the PSLA to modernise the offshore petroleum legislation through the use of common use English. The OPGGSA consequently incorporated greenhouse gas legislation.

The offshore petroleum legislation, regulations and guidelines provide for the orderly exploration for and production of petroleum and greenhouse gas resources, and sets out a framework of rights, entitlements and responsibilities of governments and industry.

Upstream

The Australian Government encourages investment in petroleum exploration through the annual release of offshore petroleum exploration acreage. The Acreage Release is underpinned by Australia's stable economic environment and well-established regulatory framework for offshore petroleum activities.

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Government

Australia is a federal parliamentary monarchy with the UK monarch as head of state represented by a Governor-General. The executive consists of the Federal Executive Council which gives legal effect to decisions of the cabinet, comprising the prime minister and ministers of state.

The party with majority support in the House of Representatives forms the government and its leader becomes Prime Minister. Parliament is bicameral comprising an elected 76-member Senate and an elected 150-member House of Representatives.

The Department of Environment and Energy is responsible for Australia's overall policies on oil and gas exploitation.

The Department of Mines and Petroleum (DMP) is responsible for Western Australia's resources sector. The Ministry for Energy and Resources is responsible for Victoria's resources sector.

In Queensland the Department of Natural Resources and Mines has responsibility whilst in South Australia it is the Department of State Development. Geoscience Australia is the public body that advises on the geology of the country.

Australia's production of oil, condensate and LPG peaked in 2000 and has steadily declined since then. Australia's gas production continues to grow, meeting growth in domestic and export demand.

The majority of Australian petroleum production is sourced from Commonwealth waters adjacent to Western Australia. Production from waters adjacent to Victoria accounts for the next highest share.

Western Australia and Victoria remain the largest gas producing states in Australia, while Queensland production, predominantly from coal seam gas, continues to increase its share.

Offshore production is becoming more important. The number of exploration wells drilled in offshore waters has remained relatively steady since 1990, while the number of wells onshore has trended downwards over this period.

Source: A Barrel Full

REVIEW OF SIGNIFICANT BASINS

Amadeus Basin

The Amadeus Basin is exposed over about 170,000 km² in central Australia. The majority of the basin lies within the Northern Territory (NT), but about 30,000 km² extends into Western Australia (WA). Whereas the eastern part of the basin is relatively accessible, well studied, and has an existing petroleum industry infrastructure, the western portion is poorly explored and access is difficult.

Bonaparte Basin

The Bonaparte Basin, consisting of the Northern Bonaparte and Southern Bonaparte Basins, is the most northerly sedimentary basin in Western Australia, straddling the border between the Northern Territory and Western Australia. Most of the basin is offshore, covering 250,000 km² compared to just over 20,000 km² onshore.

The Bonaparte Basin consists of the following structural elements: Ashmore Platform, Vulcan Sub-basin, Londonderry High, Petrel Sub-basin, Darwin Shelf, Malita Graben, Sahul Syncline Nancarrow Trough, Laminaria High, Flamingo High, Flamingo Syncline, Sahul Platform, Sahul Syncline, Troubadour Terrace, Calder Graben.

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Browse Basin

The Browse Basin covers an area of approximately 140,000 km² and lies entirely offshore, north of Broome. The basin is bounded by the Leveque Shelf in the south, the Kimberley Block to the east, and the Ashmore Platform and Scott Plateau in the north, and grades into the offshore Canning Basin to the southwest. The area can be serviced from Broome and Derby, which have port and air facilities. The economics of development operations in the Browse Basin are often adversely affected by the isolation of the area and by the fact that the majority of the basin lies in waters more than 200 m deep.

Canning Basin

The onshore Canning Basin covers an area of about 530,000 km² in central-northern Western Australia, and extends offshore for a total basin area of more than 640,000 km², of which 110 000 km² is in State waters. The succession in the onshore basin ranges in age from Ordovician to Cretaceous, but is predominantly Paleozoic. World-renowned Devonian reefs exposed on the Lennard Shelf in the northeast part of the Canning Basin provide excellent insight into the subsurface carbonate geology. The Blina oilfield produces from these reefs.

Northern Carnarvon Basin

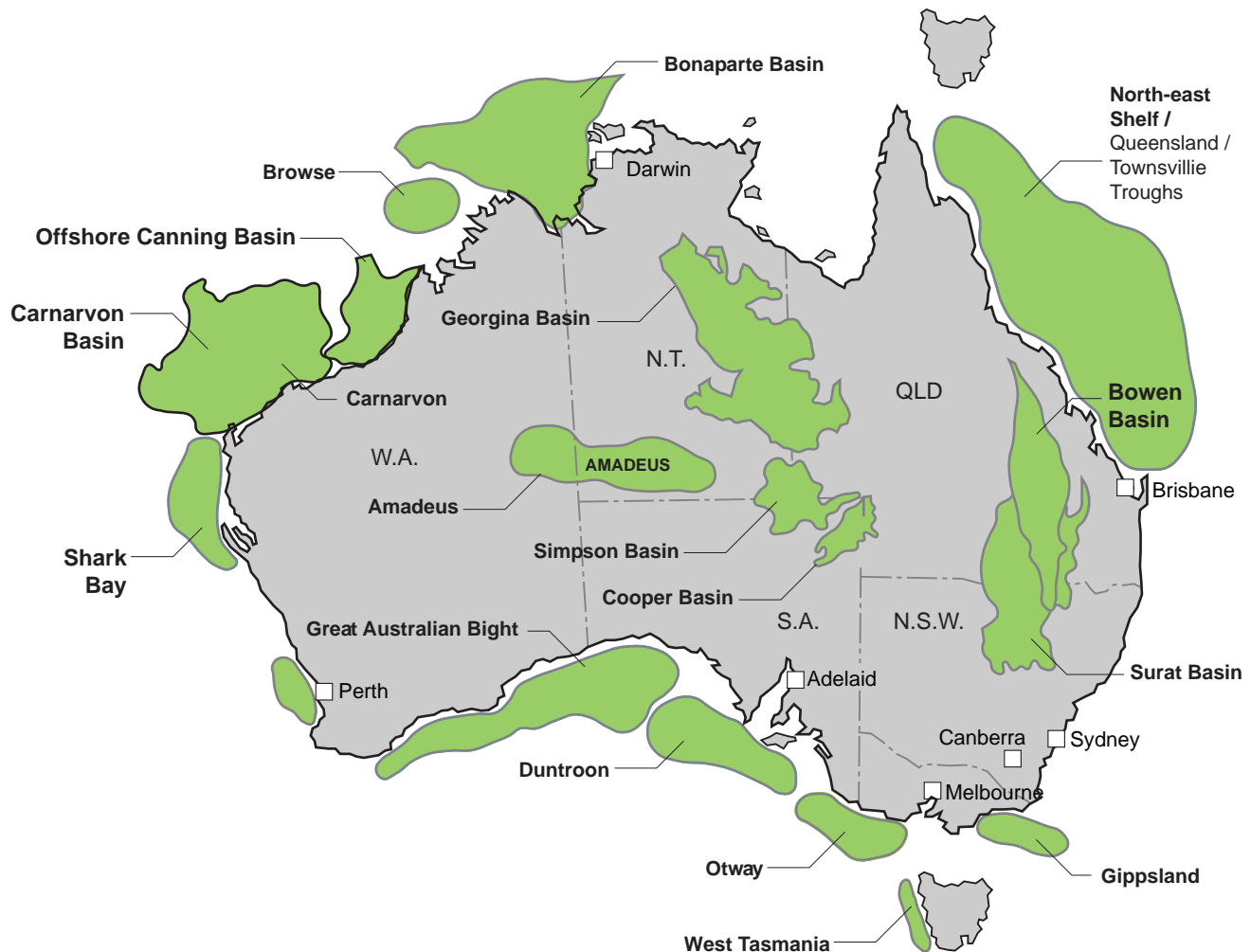
The Northern Carnarvon Basin, and in particular the Barrow and Dampier Sub-basins, is regarded as the premier hydrocarbon basin of Australia, and is one of the more intensely explored areas of the country. The basin lies mainly offshore, extending north from the Pilbara Craton to the continental–oceanic crust boundary, and covers about 500,000 km².

The Northern Carnarvon is transitional to and overlies the predominantly onshore Southern Carnarvon Basin. Several islands provide excellent locations for production facilities and bases in the basin (e.g. Barrow Island, Airlie Island, Varanus Island and Thevenard Island).

Southern Carnarvon Basin

The onshore, primarily Paleozoic, Southern Carnarvon Basin has seen minimal exploration compared to the adjoining Perth and Northern Carnarvon Basins. The Southern Carnarvon extends west from the Precambrian shield to the Mesozoic offshore Perth and Northern Carnarvon basins, and covers approximately 200,000 km².

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Officer Basin

The Officer Basin extends 1500 km from the southeastern flank of the Pilbara Craton to the central-western part of South Australia and, within Western Australia, occupies an area of about 310,000 km².

Perth Basin

The Perth Basin extends south from the Southern Carnarvon Basin and covers an area of about 100,000 km², from the Yilgarn Craton in the east to the edge of the continental shelf in the west. The onshore area is readily accessible, consisting of farming and shrub land in the central region. The undulating northern portion of the basin has relatively simple access from main roads. In the south, forestry and grazing are the main land uses.

The basin is close to petroleum industry infrastructure, including two major gas pipelines and trucking facilities to

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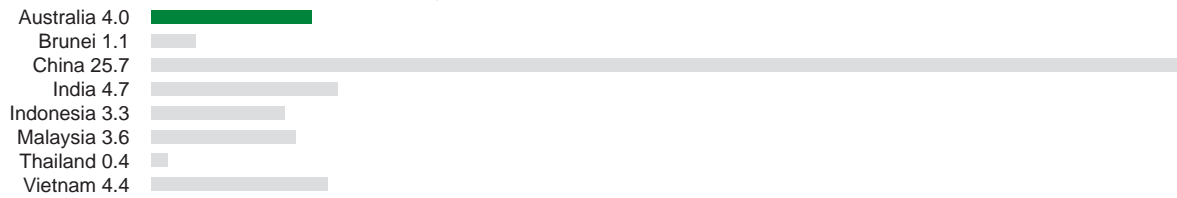
an oil refinery 30 km south of Perth. The Parmelia Gas Pipeline provides ready access to market and allows economic exploitation of small discoveries.

Northeast Shelf

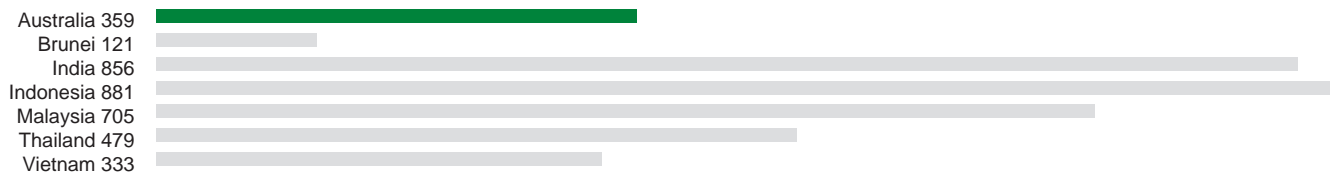
The Australian Northeast Shelf extends roughly 2000 km along the coast of Queensland. The region is influenced by the South Equatorial Current and the presence of the Great Barrier Reef system (GBR), the largest system of corals and related life forms in the world.

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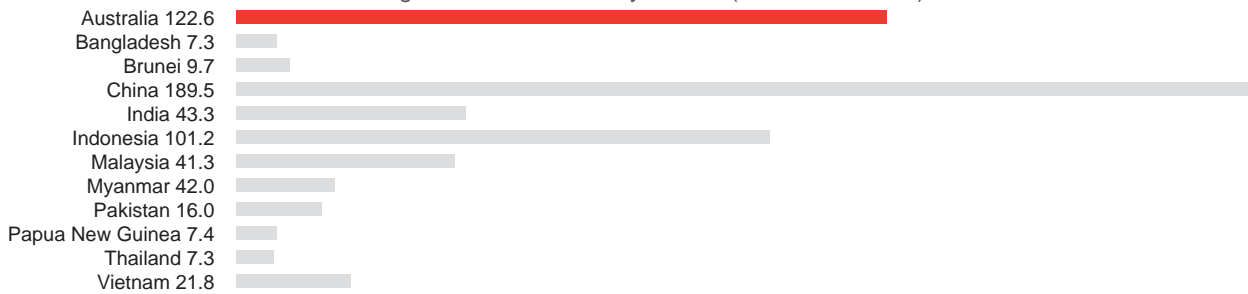
Proved oil reserves at 2016 year end (Thousand million barrels)



2016 Oil production (Thousand barrels daily)



Proved natural gas reserves at 2016 year end (Trillion cubic feet)



2016 Natural gas production (Billion cubic metres)

