

Chapter 8 Mining and Energy

Key Points

- » In terms of output, mining is the largest industry in the Territory, accounting for 25 per cent of gross state product (GSP) in 2005-06, compared to 7 per cent nationally.
- » Mining output is volatile as production is dominated by a small number of large projects. Global supply and demand conditions and the impact of exchange rate movements on competitiveness are key factors affecting production levels and price.
- » In recent years, declining output from the Laminaria-Corallina oilfield in the Timor Sea has been partially offset by increasing gas and condensate production from Bayu-Undan, as well as liquefied natural gas (LNG) production at the Wickham Point plant.
- » Mineral production and processing is expected to significantly increase in the next few years, with growth driven largely by increased production of alumina, gold and manganese.
- » Mineral and energy production is estimated to increase by 26.1 per cent to \$6.3 billion in 2006-07. More moderate growth of 6.6 per cent is expected for 2007-08.
- » In the medium to long term, the level of exploration is expected to continue to increase, supported by strong commodity prices and Northern Territory Government initiatives.

Mining

Mining is the most significant industry in the Territory, accounting for 25 per cent of GSP in 2005-06 (the latest year for which jurisdictional data is available), compared to 7 per cent nationally (Table 8.1). However, its high contribution to GSP is not reflected in its share of Territory employment. The Australian Bureau of Statistics (ABS) estimated resident employment in the mining industry in 2005-06 to have totalled 1900 or 1.9 per cent of total resident employment. An additional 3000 employees are associated with the Territory mining and energy industry as: fly-in fly-out (FIFO) workers; manufacturing workers at Alcan's Gove alumina plant and the Wickham Point LNG plant; and construction workers on mining and energy projects, especially the Alcan G3 expansion at Gove.

Table 8.1: Mining as a Percentage of GSP, 2005-06

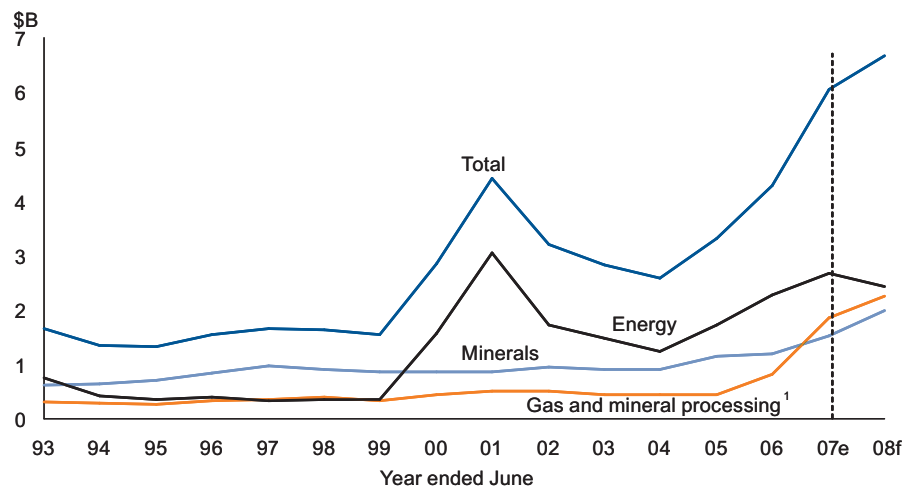
	%
New South Wales	2.2
Victoria	1.5
Queensland	11.2
South Australia	2.9
Western Australia	25.0
Tasmania	1.9
Northern Territory	24.6
Australian Capital Territory	0.0
Australia¹	6.8

¹ Mining as a percentage of GDP
Source: ABS Cat. No. 5220.0

Mining is a source of Territory Government revenue through royalties for most onshore mining operations. Royalty revenues have grown significantly in recent years, increasing by 95.1 per cent to an estimated \$75.1 million in the two years to 2006-07. The Australian Government also pays a grant to the Territory Government in lieu of uranium royalties, estimated at \$3.6 million in 2006-07. Offshore gas and oil falls under the Australian Government's tax jurisdiction.

In 2006-07, the value of mining and energy production is estimated to increase to a record level, up 41.3 per cent to an estimated \$6.1 billion. The major contributors to the increase are increased LNG production at the Wickham Point plant and increased production of oil at the Laminaria-Corallina field in the Timor Sea (Chart 8.1).

Chart 8.1: Value of Mining and Energy Production and Processing (nominal dollars)



¹ Includes alumina and LNG manufacturing

e: estimate; f: forecast

Source: Northern Territory Treasury, Department of Business, Economic and Regional Development, Department of Primary Industry, Fisheries and Mines

Minerals

Bauxite and alumina production at Gove, manganese production at Groote Eylandt and Bootu Creek, and lead-zinc production at McArthur River account for an estimated 81 per cent of the total value of mineral production in 2006-07, and the four mines are expected to continue to dominate production in the medium term. The McArthur River mine is in the process of being converted from an underground to an open cut operation, and mining is expected to recommence in the December quarter 2007.

Other important mineral resources and operations include:

- gold mines located in the Tanami Desert and Pine Creek areas;
- phosphate deposits near Tennant Creek;
- garnet sands and vermiculite near Alice Springs;
- magnesite and a major polymetallic deposit of lead, cobalt, copper, nickel and silver in the Batchelor area; and
- the Merlin diamond field south-east of Borroloola.

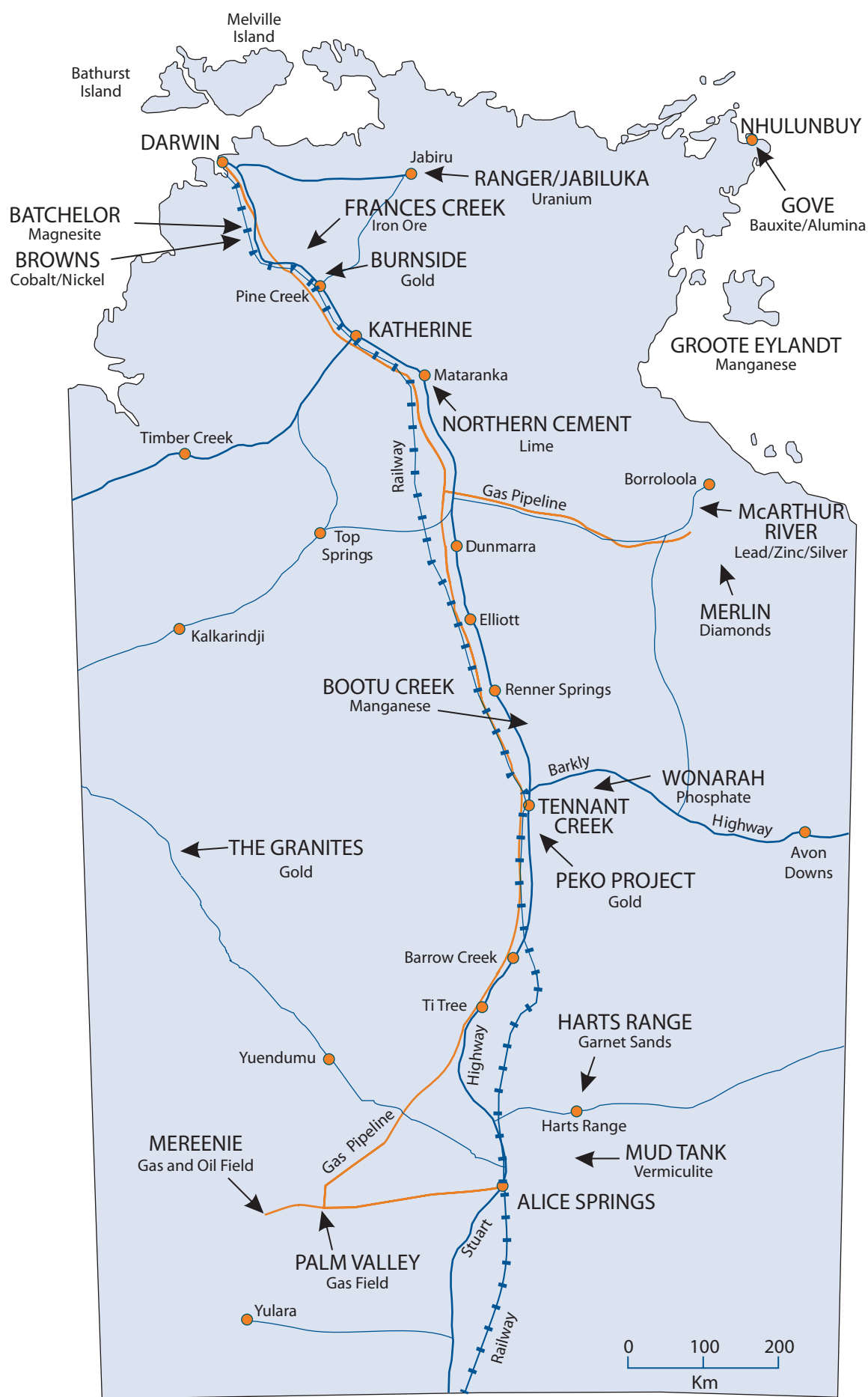
Uranium mining is reported under the 'Energy' section below.

2006-07 Mineral Production

The nominal value of mineral production and processing, including manufacturing of alumina, is estimated to increase by 33.8 per cent to \$2.3 billion in 2006-07 (Chart 8.2).

The nominal value of gold production in 2006-07 is estimated to increase by 46.2 per cent to \$396 million, due to commencement of production at Burnside, a

Onshore Mineral and Energy Resources



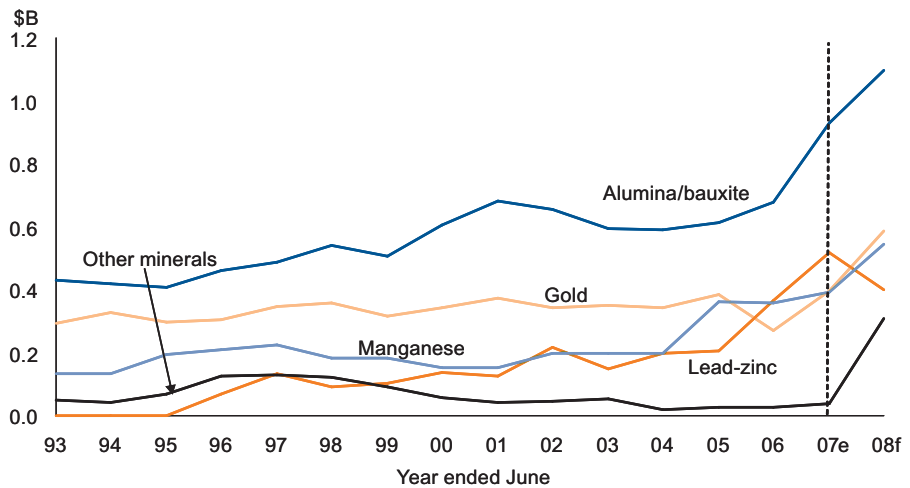
multiple orebody project near Pine Creek. The increase is estimated to be partially offset by a decline in production at The Granites mine in the Tanami region.

The value of bauxite and alumina production is estimated to increase by 37.1 per cent to \$930 million in 2006-07. The increase is largely due to greater volumes as production recovers from interruptions associated with the Alcan G3 refinery expansion, and as the new refinery capacity began to ramp up in the June quarter 2007. The value of production will also be boosted by higher alumina prices, up by an estimated 13.7 per cent in 2006-07.

The value of lead-zinc production is estimated to increase by 41.3 per cent in 2006-07 to \$519 million. After receiving approval from the Territory Government, Xstrata is in the process of converting the McArthur River mine to an open cut operation. Underground operations ceased in September 2005, causing production to decline in 2005-06, however the value of production continued to rise due to an increase in price of 165.9 per cent. Production in 2006-07 is recovering as feedstock from the test pit is being processed.

The value of manganese production is estimated to increase by 9.2 per cent to \$393 million in 2006-07, driven by increased production at both the GEMCO mine at Groote Eylandt and the Bootu Creek mine, which will more than offset a decline in manganese prices.

Chart 8.2: Value of Mineral Production and Processing (nominal dollars)



e: estimate; f: forecast

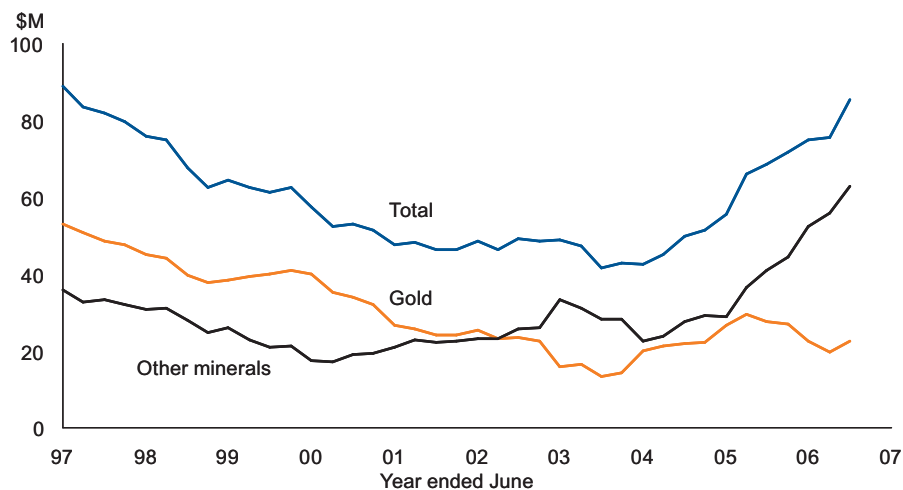
Source: Northern Territory Treasury, Department of Business, Economic and Regional Development, Department of Primary Industry, Fisheries and Mines

Exploration

Mineral exploration in the Territory and nationally increased significantly in 2005-06, the latest year for which data on exploration is available, in response to increased commodity prices and demand, particularly from China. In the Territory, private mineral exploration expenditure (including exploration for uranium) increased by 34.5 per cent to \$75 million in 2005-06. Expenditure on gold exploration, at \$22 million in 2006-07, has remained fairly steady over recent years, and now accounts for less than one-third of mineral exploration expenditure. Expenditure on exploration for other minerals has almost doubled in the last year to \$52 million. In the six months to December 2006, expenditure on mineral exploration further increased to a total of \$52 million (Chart 8.3).

Increased exploration expenditure has been influenced by the Territory Government's initiative, *Building the Territory's Resource Base*, introduced in 2003. The four year initiative provides pre-competitive geoscientific data to promote prospectivity in the Territory. The initiative also supports liaison with indigenous land owners and enhances the capacity of the Department of Primary Industry, Fisheries and Mines to process exploration and mining titles. The initiative is scheduled to end in June 2007, and will be replaced by a new initiative, *Bringing Forward Discovery* (see 'Outlook' below for more detail).

Chart 8.3: Northern Territory Mineral Exploration (moving annual total)



Source: ABS Cat. No. 8412.0

Energy

The significant energy resources in the Territory are oil, uranium, natural gas, liquid petroleum gas (LPG) and condensate (a light hydrocarbon liquid used to manufacture petrol and petrochemicals, and often found mixed with deposits of natural gas). The Territory's major energy resources and operations include:

- Ranger uranium mine, and undeveloped uranium resources Jabiluka and Koongarra in west Arnhem Land;
- onshore gas and oil operations in the Amadeus Basin at Palm Valley and Mereenie;
- offshore oil operations at Laminaria-Corallina, Jabiru and Challis/Cassini in the Timor Sea; and
- undeveloped offshore gas and condensate deposits, including Greater Sunrise, Evans Shoal, Petrel/Tern, and Crux/Argus in the Timor Sea.

In addition, 50 per cent of the value of oil and gas production from the Joint Petroleum Development Area (JPDA) is also attributed to the Territory. Currently, the two producing fields in the JPDA are Bayu-Undan (gas, LPG and condensate) and Elang/Kakatua (oil).

2006-07 Energy Production

The nominal value of energy production is estimated to increase by 46.2 per cent to \$3.8 billion in 2006-07, driven by increased production of offshore oil and LNG.

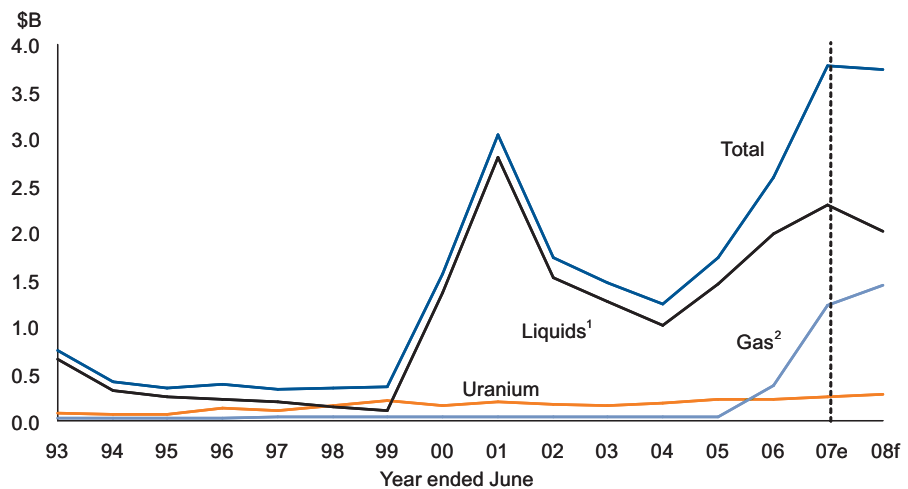
The value of oil production (excluding JPDA) is estimated to increase by 30.5 per cent to \$980 million, driven by an increase in production, but offset by lower prices. The increase is being driven by higher production at Laminaria-Corallina, as volumes continue to recover from a temporary shutdown in 2004-05 for repair work. Production at Laminaria-Corallina is expected to resume its decline in 2007-08.

The value of uranium ore production will increase by 9.7 per cent to an estimated \$256 million. Lower production caused by heavy rains in late February and early March 2007 is expected to be offset by higher uranium prices. The recent increases in uranium prices have been driven by increased global reactor requirements and decreasing supplies of secondary sources (mainly from blended-down weapons-grade uranium stocks).

The value of gas production, including LNG, will increase by 234.0 per cent to \$1.2 billion. The increase is being driven by the continuing ramp up of LNG production at the new Wickham Point facility using feedstock sourced from Bayu-Undan.

The value of JPDA oil, condensate and LPG production will increase by 6.6 per cent to \$1.3 billion, as higher prices offset a small decline in production.

Chart 8.4: Value of Territory Energy Production (nominal dollars)



1 Oil, condensate and liquid petroleum gas

2 Including LNG production

e: estimate; f: forecast

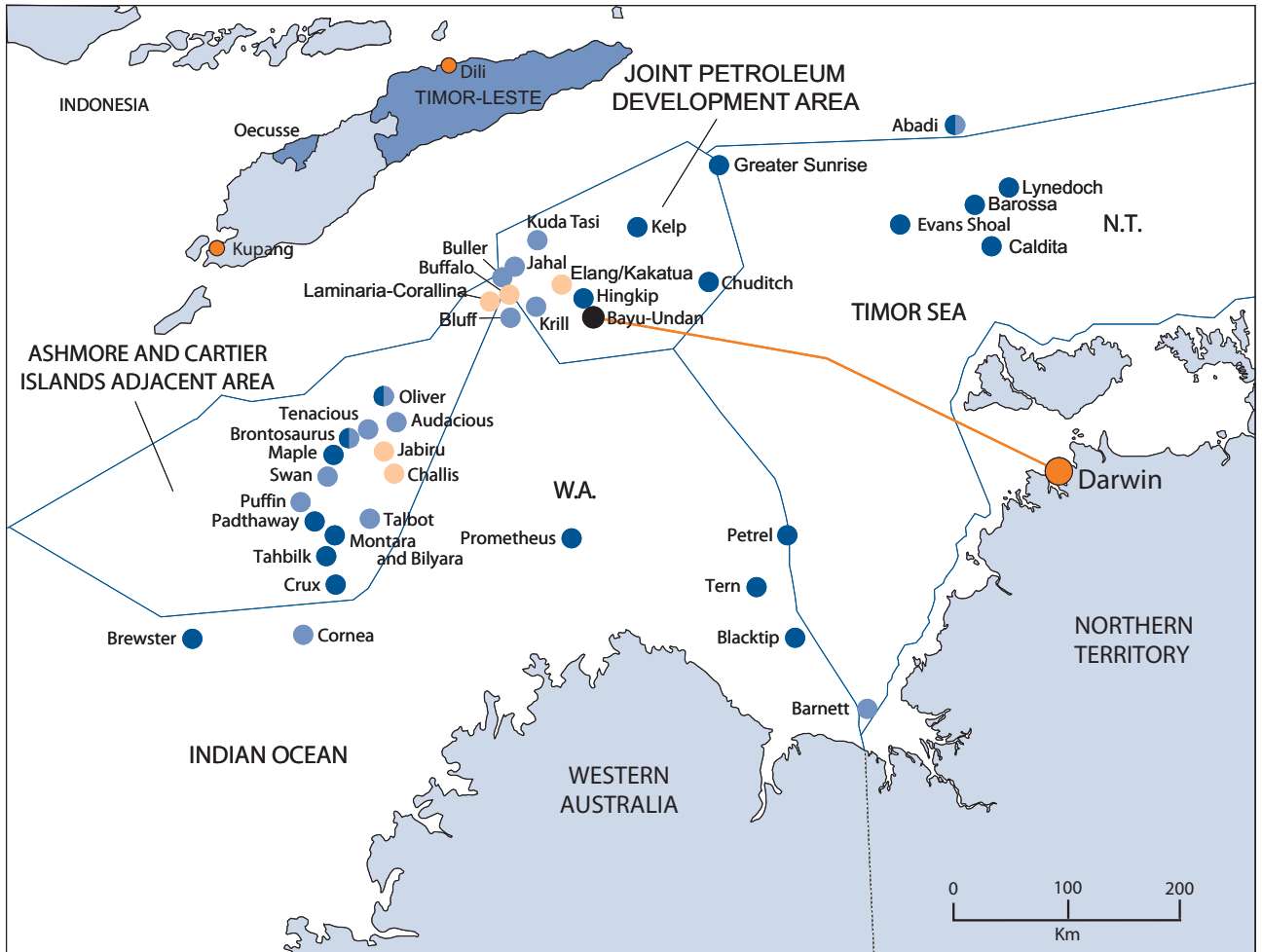
Source: Northern Territory Treasury, Department of Business, Economic and Regional Development, Department of Primary Industry, Fisheries and Mines

Exploration Relatively strong global economic growth and significant increases in oil and gas prices led to a resurgence in exploration activity in the past three years. Following a tripling of oil and gas exploration expenditure in 2004-05, expenditure tripled again in 2005-06, increasing from \$99 million to \$299 million. Expenditure is expected to increase further in 2006-07, with \$177 million recorded in the six months to December 2006.

Like mineral exploration, increased oil and gas exploration has been supported by the Territory Government's Building the Territory's Resource Base initiative through the provision of geoscientific information to explorers. The initiative has contributed to a major increase in the number of onshore exploration permits.

Uranium exploration, previously concentrated in west Arnhem Land and dominated by a few companies, expanded significantly in 2005-06, driven by strong increases in uranium prices since 2003. By June 2006 there were more than 40 companies active in almost every geological province in the Territory.

Timor Sea Oil and Gas



LEGEND

- Producing gas field
- Producing oil field
- Gas pipeline
- Discovered undeveloped gas field
- Discovered undeveloped oil field

Outlook

Growth in the total value of mineral and energy production is expected to moderate in 2007-08 to 10.3 per cent, resulting in a total value of production of \$6.7 billion.

Minerals

The outlook for minerals is determined by global supply and demand, with world economic growth and the exchange rate being major influences on demand. Global economic growth is expected to moderate in 2007-08, as growth slows in China, the United States and the European Union. Combined with increased global production, this will contribute to moderate to significant price declines of a number of the Territory's major commodities in 2007-08. Nevertheless, global commodity demand and prices are expected to remain high by historical standards, with strong demand continuing to be driven by ongoing growth in China. A potential depreciation of the Australian dollar in late 2007 or 2008 will also enhance the competitiveness of Australian producers.

The value of mineral production, including minerals processing, in the Territory is forecast to increase by 29.1 per cent to \$2.9 billion in 2007-08, largely due to expected increases in gold, manganese and alumina.

The value of gold production is forecast to increase by 48.3 per cent to \$587 million. Although prices are anticipated to remain steady, volumes will be boosted by production at the new Burnside project near Pine Creek, incorporating feedstock from numerous mines in the region and processing at the Union Reefs plant.

The value of manganese production is forecast to increase by 39.0 per cent to \$546 million in 2007-08. Prices are forecast to increase by 23.2 per cent on the back of stronger demand and constrained supply. Volumes will be boosted by increased production at Groote Eylandt and the continued ramp up of production at the Bootu Creek mine.

The value of alumina production is forecast to increase by 17.4 per cent to \$873 million in 2007-08, reflecting increased production volume associated with the completion of the Alcan G3 refinery expansion. Growth in the value of production will be partially offset by a forecast decline in price, driven by increasing global supply.

The value of Territory base metal production, including lead-zinc concentrate and copper concentrate, is forecast to fall in 2007-08 to \$412 million. Although production volumes at the McArthur River mine will be steady in the year, prices are expected to fall by 22.8 per cent, as increased global supply begins to come on line. The decline in the value of lead-zinc produced will be partially offset by the commencement of production at Browns oxide deposit near Batchelor (copper, cobalt and nickel concentrate). The same operator also intends later to develop a large sulphide orebody containing copper, cobalt, nickel, lead and zinc at the same site.

Production of iron ore at Frances Creek is anticipated to begin in May 2007, with the first load of ore scheduled to be transported by rail to Darwin for export through the port in the September quarter 2007. The value of production is forecast to be \$67 million in 2007-08, building up to \$136 million in the following years.

Oil Oil production will resume its decline in 2007-08 due to lower production from the Laminaria-Corallina field, which accounts for almost 98 per cent of oil production in the Territory. The fall in production at Laminaria-Corallina is a normal function of declining reserves and will continue. A number of other marginal oil discoveries in the Timor Sea await further appraisal and/or development, including Audacious, Barnett, Montara, Oliver, Puffin, Talbot and Tenacious.

The outlook for oil prices is uncertain, and depends not only on global supply and demand conditions, but also on geopolitical uncertainty regarding major oil producers. Although the Australian Bureau of Agricultural and Resource Economics (ABARE) has forecast moderate price declines in 2007 and 2008, ongoing tensions with Iran, in particular, have the potential to significantly drive up prices in the short to medium term.

Gas The value of gas production, including LNG, is forecast to increase by 17.5 per cent in 2007-08, reflecting increased LNG production at the Wickham Point facility using feedstock gas sourced from Bayu-Undan.

Looking further ahead, the Territory remains on the verge of a major development phase for gas reserves and for gas-based manufacturing. Should efforts to bring more Timor Sea gas onshore prove successful, it could be used as feedstock for new manufacturing industries. An area at Glyde Point, on the Gunn Point Peninsula to the east of Darwin, has been identified as a potential site for a major gas-based industrial estate and associated port facilities. Possible gas manufacturing projects include further production of LNG or gas-based products, such as methanol, ethane,

ammonia/urea fertilisers and various petrochemicals. Timor Sea gas also has the potential to provide a cheap and efficient energy source for the manufacture of alumina, magnesium and other ore concentrates, and for the production of electricity that could advance local value-adding opportunities.

Development of the Greater Sunrise gas field has progressed with the recent ratification by the Timor-Leste and Australian Governments of the revenue-sharing agreement signed in January 2006. The ratification gives Woodside greater certainty in moving ahead with developing the field, however there are a number of regulatory and technical issues that need to be resolved before the project can go ahead. In particular, an investigation needs to be completed on the relative merits of locating an LNG processing facility in Timor-Leste or Darwin.

The Northern Territory's Power and Water Corporation has signed an agreement with Eni Australia for the sale of gas from the Blacktip field, a Western Australian administered field 100 kilometres west of Wadeye in the Bonaparte Basin. The agreement secures the supply of gas from Blacktip to meet the Territory's long-term gas requirements from 2009.

Uranium ABARE has forecast a 43 per cent increase in uranium prices in 2007-08, with some moderation expected in 2008-09 as world supply increases.

In the Territory, uranium production is forecast to fall in 2007-08, as output from the Ranger mine continues to be impacted by the effect of recent heavy rains on the operating pit. However, the value of production is forecast to increase by 7.9 per cent in 2007-08, as higher uranium prices offset the decline in production.

ERA is planning to expand the current operating pit at the Ranger mine, which has the potential to extend the life of the pit to 2014-15. The expansion is possible due to the current high price of uranium, which makes it viable to mine and process lower quality ore.

The Jabiluka mine remains on a stand-by, care and environmental maintenance status, and the operator has given an undertaking to the traditional owners that mining will not begin without their consent. Reserves at Jabiluka are estimated to be sufficient to maintain production for nearly three decades.

Exploration Minerals exploration expenditure in the Territory has recovered significantly in the past three years, following a period of gradual decline over the seven years to 2003-04, while petroleum exploration has risen to record levels. In the medium to long term, the level of exploration is expected to continue to increase, consistent with Australian trends and supported by Territory Government initiatives. In particular, increased exploration expenditure is expected in 2007-08 for gold, uranium and base metals. Petroleum exploration is expected to continue growing in 2007-08, although at much lower rates compared to the previous two years.

The Territory Government initiative *Building the Territory's Resource Base* is scheduled to end in June 2007, and will be replaced by a new four year initiative *Bringing Forward Discovery*. The new initiative will continue the support provided by the previous initiative, including the provision of geoscientific data aimed at improving regional prospectivity, and the facilitation of greater exploration access to Indigenous land by supporting partnerships between government, industry and Indigenous organisations.