



australian commodities

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abare

minerals and energy

major development projects - april 2007 listing

alan copeland and commodity analysts, resource markets and infrastructure section

- » **Expenditure on minerals and energy exploration in Australia, at an estimated \$4 billion in 2006-07, is the highest in real terms (2006-07 dollars) since 1982-83.**
- » **New capital expenditure in Australia's mining industry in 2005-06 was \$18.6 billion, more than double the average annual expenditure in real terms (2006-07 dollars) for the past 25 years. Surveys of industry intentions indicate the possibility of further increases to almost \$23 billion in 2006-07 and over \$30 billion in 2007-08.**

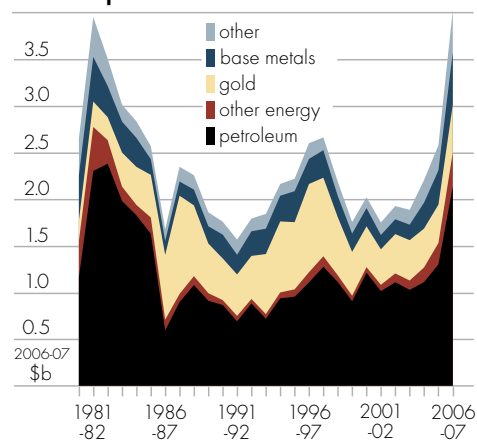
exploration expenditure

Exploration is an investment in knowledge about the location, size and quality of petroleum and mineral deposits. The ability of Australia's minerals and energy sector to sustain its recent strong growth and expand its contribution to national economic performance in the medium and longer term depends on the amount of investment in minerals exploration. The recent strong growth in Australia's minerals and energy sector output and expected future increased contribution to the Australian economy are underpinned by recent exploration activity.

Expenditure on minerals and energy exploration in Australia is estimated to total over \$4 billion in 2006-07, an increase of over 56 per cent on exploration expenditure in 2005-06. In real terms (2006-07 dollars), 2006-07 exploration expenditure will be the highest on record and around 72 per cent higher than the average annual expenditure on exploration over the past 25 years. While exploration expenditure has increased recently, it cannot be determined from ABS data what proportion of the increased expenditure is related to increased exploration activity or attributable to higher costs of inputs, such as labour and equipment. In the first half of this decade, exploration expenditure in Australia, in real terms, was well below the annual average of the past 25 years.

The significant number of projects on ABARE's project list indicates that there will be strong growth

fig A private minerals exploration expenditure - Australia



development projects

in minerals and energy production capacity. Average exploration expenditure will need to be maintained above levels achieved in 2005-06 (in real terms) in order to increase the resource base needed to underpin future development of the minerals and energy sector.

Over the past two years, brownfield exploration – that is, exploration around existing or known deposits – has made up an increased proportion of total exploration expenditure. This can be partly explained by the current trend of developing projects with larger production capacities, which generally require larger resource delineation programs. In addition, mining companies are reassessing reserves at current and depleted mining areas, with the view of extracting additional reserves that are now considered to be economic at current high commodity prices. Mining at or around existing deposits is attractive for companies because projects can be started sooner and generally have a lower capital expenditure because often there is existing infrastructure in place.

In 2006-07, exploration expenditure is expected to increase across all major commodities. Petroleum exploration is estimated to increase to \$2.14 billion, an increase of 64

abare's list of major minerals and energy development projects

the full list

ABARE's listing of major minerals and energy projects expected to be developed over the medium term is compiled every six months. Information contained in the list spans the mineral resources sector and includes energy and minerals commodities projects and minerals processing projects. The information comes predominantly from publicly available sources but, in some cases, is supplemented by information direct from companies. The list is fully updated to reflect developments in the previous six months. The projects listing is released around May and November each year.

what's in the list

The latest projects list contains the following details on projects:

- » project name
- » location
- » expected startup date
- » additional output capacity
- » proponent company or joint venture
- » capital cost of the project
- » additional employment, where available.
- » project status

With one industry exception, ABARE's listing provides details of each announced project for which total capital expenditure is expected to exceed \$40 million. The exception is the gold industry, which typically has a relatively large number of smaller projects. For gold, the expenditure threshold for inclusion in the listing is \$15 million.

In general, included projects are at relatively advanced stages of planning. That is, for new projects, stage of planning categories range from 'prefeasibility study underway' through to 'under construction'.

Projects are listed by the principal mineral commodity to be produced, under the broad headings: 'Mining projects - energy', 'Mining projects - minerals' and 'Minerals processing facilities'. The listing includes new greenfields projects as well as expansions of existing projects.

where to get the list

The list is available only as an electronic product.

The list can be downloaded from 'latest releases' at abareconomics.com
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per cent from 2005-06. Petroleum exploration expenditure in 2006-07 is likely to be the highest (in real terms) since 1982-83 and 74 per cent higher than the annual average over the past 25 years. Increased petroleum exploration has been encouraged by historically high global oil prices. With world oil prices forecast to remain relatively high in the short term, exploration expenditure can be expected to remain historically high.

Iron ore exploration expenditure in 2006-07 is estimated to almost double to \$320 million. A number of successive annual contract price rises and the prospect of continued strong Chinese demand for iron over the medium term are important drivers behind the significant increase in expenditure.

Since 2003-04, gold exploration expenditure in real terms has remained relatively stable at around \$400 million a year. In 2006-07, however, gold exploration expenditure is estimated to increase by 25 per cent to \$515 million. The increase in gold exploration activity is attributable to the increase in Australian dollar gold prices, which in 2006 averaged \$800 an ounce, an increase of 37 per cent from 2005.

Base metals exploration expenditure in 2006-07 is estimated to total \$560 million, an increase of 52 per cent from 2005-06. This increase is mainly attributable to strong rises in expenditure on copper, nickel and silver-lead-zinc exploration, reflecting substantial rises in global prices for these commodities. For example, in 2006, copper prices increased by over 80 per cent, while nickel prices rose by more than 65 per cent. In real terms, exploration expenditure on base metals in 2006-07 is expected to be more than double the 25 year average (\$260 million) and the highest on record.

In general, decisions to invest in exploration depend on the probability of discovering an economic mineral deposit or extending the resource base of a known deposit. A range of economic and policy factors will also influence companies' expectations of the likely return on investing in exploration. Such factors include: expectations and risks relating to mineral prospectivity; prevailing and expected mineral prices; existing mining and processing technologies; input costs more generally; land access; and government policies.

medium term exploration expenditure

Over the medium term, exploration expenditure is expected to be influenced by a different set of factors in each of the main exploration sectors.

In the petroleum sector, short term oil prices are an important factor in encouraging increased exploration activity. However, there are a number of other factors that are likely to have a significant bearing on decisions relating to exploration activity. These include: longer term oil price trends, Australia's relative prospectivity for petroleum; prospects for Australian companies' share of growing global LNG trade; the need for long term planning, particularly for relatively expensive offshore petroleum exploration; exploration costs; availability of skilled labour; and the concurrent commitment of resources (funds, equipment and labour) to other in such as project development.

Movements in the Australian dollar price of gold will be a key factor influencing gold exploration expenditure. However, expected future costs of exploration and development will also play an important role in determining future expenditure. Rises in the costs of labor, fuel and other inputs (such as steel) have increased development costs and could be a negative influence on gold exploration expenditure over the medium term.

In the base metals sector, the price outlook will clearly be important, as demonstrated by the rise in copper and silver-lead-zinc exploration expenditure. Other important factors are expected to be: future Chinese demand for base metals (including nickel);

development projects

assessments of the development potential of several known (but as yet undeveloped) base metal deposits in Australia; costs of exploration; and Australia's relative attractiveness for exploration.

capital expenditure

Data from the Australian Bureau of Statistics survey of new capital expenditure in the mining and metal products industries give an indication, in aggregate terms, of the pace and scale of development in the minerals and energy sector, both historically and in the short term (figure B).

ABS survey data show that new capital expenditure in the mining industry was \$18.6 billion in 2005-06, 80 per cent higher than in 2004-05. In real terms (2006-07 dollars), new capital expenditure in 2005-06 was more than double the average annual expenditure for the past 25 years (\$8.6 billion).

There are indications that capital expenditure in the mining sector may increase rapidly

in 2006-07 and again in 2007-08. Based on industry intentions canvassed in the March quarter 2007, ABS data indicate that capital expenditure on mining in 2006-07 may be just under \$23 billion and over \$30 billion in 2007-08. If the capital expenditure in 2006-07 and 2007-08 is realised, this would represent increases of 22 per cent and 61 per cent respectively from the record expenditure in 2005-06. The expected continued high level of capital expenditure in the mining industry in the near future is consistent with the development trends shown in the full list of major mineral and energy projects (see map 1).

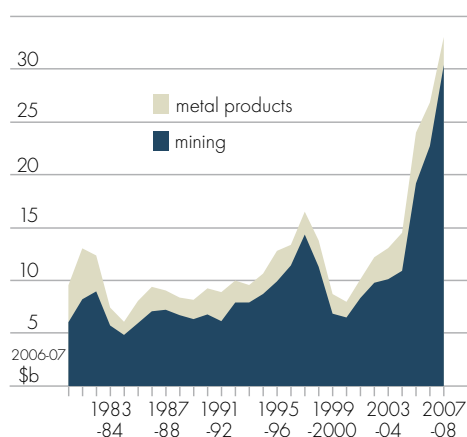
Capital expenditure in the metals products sector, which includes the minerals processing activities covered in ABARE's projects list, was \$4.8 billion in 2005-06, 41 per cent above expenditure in 2004-05. Paralleling the result in mining, real expenditure in the metal products sector in 2005-06 is the highest on record and more than double the 25 year annual average of \$2.5 billion (in 2006-07 dollars).

However, surveyed industry intentions suggest that metal products expenditure could fall in 2006-07 to about \$4.1 billion and \$3.2 billion in 2007-08. The possible decreases in metal products capital expenditure reflect the imminent completion of some large projects and the lack of commitment to any large metal processing projects in the past twelve months.

recently commissioned projects

In the six months ended April 2007, 23 major minerals and energy projects, with a total capital expenditure of \$3.36 billion, were completed. The completion of these projects will result in increased production and export capacity for a range of commodities, including coal, natural gas, bauxite, base metals, gold, iron ore, mineral sands and nickel. A summary of these projects is provided in table 1.

fig B new capital expenditure



development projects

The total number of projects completed in the six months ended April 2007 was one less than for the six months ended October 2006 and just below the record number (27) completed in the six months to April 2006 (table 2, figure C). However, the total capital cost was significantly less than in the six months ended April 2006 and October 2006. The average value of projects completed in the six month period to April 2007 was \$144 million, down from the historical nominal average over the past nine years of around \$234 million.

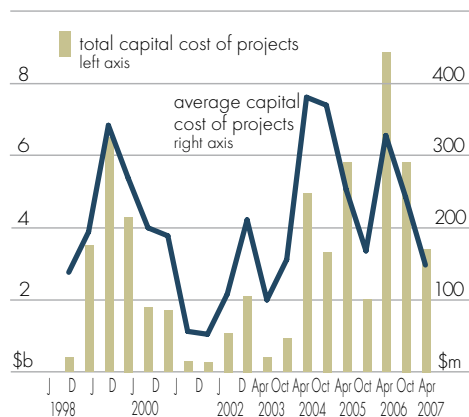
Looking ahead, ABARE's project list indicates that the rate of project completions is likely to increase in the short term, with over 45 advanced projects scheduled for completion in the second half of 2007. However, there is the possibility that some of these projects will not meet announced scheduled completion dates or cost budgets, reflecting strong industrywide competition for skilled labour and equipment. In addition, progress on a

major mineral resource developments – projects completed, october to april 2007

commodity	project	location	company	capital expenditure \$m
mining – energy projects				
black coal	Ashton longwall	NSW	Felix Resources/Itochu/IMC Pan Asia	150
	Boggabri opencut	NSW	Idemitsu Kosan	35
	Newpac longwall	NSW	Resource Pacific	75
	Tarawonga opencut	NSW	Whitehaven Mining/Idemitsu	38
	Wilpinjong opencut	NSW	Peabody	123
	Curragh North	QLD	Wesfarmers	360
	Ensham Central dragline	QLD	Ensham Resources	100
	Isaac Plains	QLD	Aquila/CVRD	66
	Kogan Creek opencut	QLD	C S Energy	80
	New Acland opencut	QLD	New Hope Corporation	60
	Poitrel	QLD	BHP Billiton/Mitsui	330
	Wilkie Creek (washplant upgrade)	QLD	Peabody Surat	15
	petroleum	Goodwyn A Low Pressure Train	WA	Woodside Energy
infrastructure – energy projects				
	Kooragang Island coal terminal expansion	NSW	Port Waratah Coal Services	170
	Dampier-Bunbury gas pipeline (Stage 4)	WA	DBP	433
mining – minerals projects				
bauxite	Weipa bauxite mine expansion	QLD	Rio Tinto	156
	Ely bauxite mining project	QLD	Alcan/ Rio Tinto	0
copper	Northern 3500 underground orebody	QLD	Xstrata	38
gold	Charters Towers (Warrior deposit)	QLD	Citigold Corporation	50
	Laverton redevelopment	WA	Crescent Gold	15
iron ore	Tom Price/Marandoo/ Nammuldi mine	WA	Rio Tinto	382
lead-zinc-silver	Lennard Shelf	WA	Teck Cominco/Xstrata	28
mineral sands	Douglas	Vic	Iluka Resources	284

development projects

fig C **completed projects**

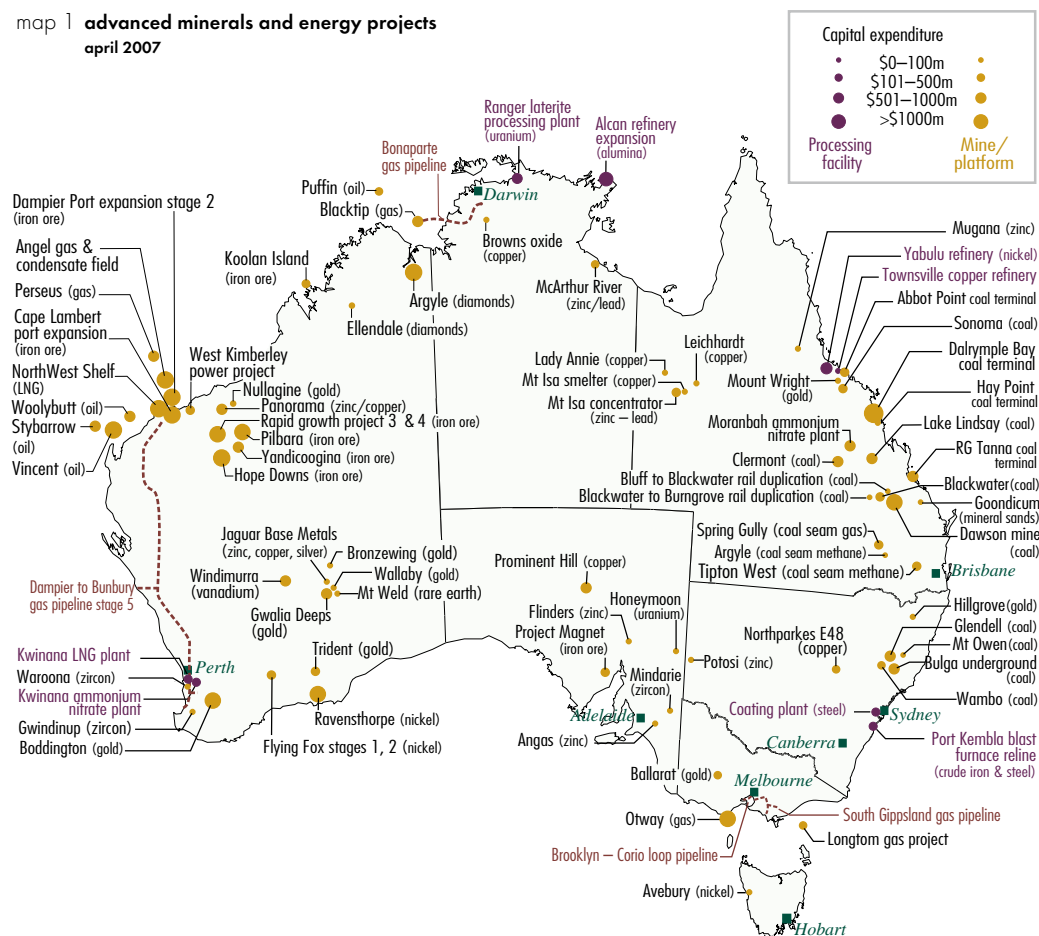


number of projects has been hampered by unfavourable weather conditions, particularly in Western Australia.

energy projects

In the six months ended April 2007, 15 energy projects (including infrastructure) were completed, with a capital expenditure of \$2.4 billion. The largest of these projects was the \$433 million stage 4 expansion of the Dampier-Bunbury gas pipeline. The stage 4 expansion will increase the pipeline's capacity by 100 terajoules a day. The pipeline owners, Dampier Bunbury Pipeline, has already committed to the stage 5A expansion, which will cost around \$700 million and add a further 100 terajoules a day of

map 1 **advanced minerals and energy projects**
april 2007



capacity. There was one other natural gas project completed – Woodside’s \$326 million Goodwyn A Low Pressure Train, located 130 kilometres off the coast of northern Western Australia. The newly completed project will allow Woodside to initially increase its gas production rate from the Goodwyn Platform and ultimately enhance gas recovery.

Thirteen coal projects – six in New South Wales and seven in Queensland – were completed in the six months to April 2007, with a total capital expenditure of \$1.6 billion. The largest of these projects is Wesfarmers’ \$360 million Curragh North project, which will produce around 2.5 million tonnes a year of coking coal. Another large Queensland coal project that was recently completed was the 3 million tonne BHP Billiton and Mitsui Poitrel mine. The Poitrel mine and Millennium mine, completed in July 2006, will share the Red Mountain Joint Venture’s coal handling and preparation plant that was commissioned in October 2006.

Other black coal projects to be completed in Queensland for the period ended April 2007 include two new mines, Isaac Plains and Kogan Creek. Isaac Plains, located north east of Moranbah, will produce around 1.6 million tonnes of thermal and pulverised coal injection coal, while the Kogan Creek mine will supply 2.8 million tonnes a year of thermal coal to the Kogan Creek power station, which itself is in the final stages of construction. The New Acland and Wilkie Creek mines were expanded, which resulted in increased thermal coal production capacity of 1.5 million tonnes and 0.6 million tonnes respectively. At Ensham, 40 kilometres north east of Emerald, construction was completed on a \$100 million dragline. The new dragline will not add significantly to productive capacity; however, it will enhance Ensham’s cost competitiveness.

In New South Wales, the largest project completed, in terms of capital expenditure, was the expansion of the Kooragang Terminal at the Port of Newcastle. The \$170 million expansion will increase coal loading capacity at the port by 13 million tonnes to 77 million tonnes. The operators of Kooragang Terminal recently received state government approval to expand the Terminal’s capacity by a further 43 million tonnes a year. Production capacity of the New South Wales coal industry will increase following the completion of the Wilpinjong (3 million tonnes thermal coal), Boggabri (1.5 million tonnes thermal coal) and Tarawonga (1.3 million tonnes thermal and semisoft coking coal) opencut mines and the Ashton (3 million tonnes thermal and semisoft coking coal) and Newpac (4 million tonnes coking coal) long-walls. All five mines will export coal via the expanded Port of Newcastle.

metal mining projects

On the metal mining front, the largest development commissioned in the six months ended April 2007 was the expansion of Rio Tinto’s Tom Price, Marandoo and Nammuldi mines in the Pilbara region of Western Australia. The expansion of the mines cost around \$382 million and will add around 15 million tonnes of increased iron ore production capacity. It is anticipated that in the second half of 2007, five iron ore projects will

2 completed projects – january 1998 to april 2007

	number of projects	total capital cost of projects	average capital cost of projects
	no.	\$m	\$m
six months ended			
June 1998	3	415	138
December 1998	18	3 500	194
June 1999	19	6 500	342
December 1999	16	4 300	269
June 2000	9	1 800	200
December 2000	9	1 700	189
June 2001	5	282	56
December 2001	5	262	52
June 2002	10	1 082	108
December 2002	10	2 110	211
four months ending			
April 2003	4	400	100
six months ending			
October 2003	6	937	156
April 2004	13	4 956	381
October 2004	9	3 328	370
April 2005	23	5 812	253
October 2005	12	2 012	168
April 2006	27	8 854	328
October 2006	24	5 824	243
April 2007	23	3 314	144
total	245	57 388	234

development projects

be completed including BHP Billiton's Rapid Growth 3 Project and Rio Tinto's Dampier port expansion.

In Queensland, Rio Tinto completed a \$156 million upgrade of its Weipa bauxite mine, which included construction of a power station, tailings dam and a ship loader. Rio Tinto will also operate the Ely bauxite deposit which is owned by Alcan and located adjacent to the Weipa deposit. The Ely deposit will produce 2.5 million tonnes a year of bauxite; however, the mine did not require any startup capital expenditure because Rio Tinto will use equipment and infrastructure associated with their Weipa operations to mine the Ely deposit.

In central Queensland, Citigold Corporation's Warrior deposit at the Charters Towers goldfield was completed at a cost of \$50 million and has an annual gold production capacity of around 40 000 ounces. Citigold has recently completed prefeasibility studies for the Sunburst, Brilliant and Day Dawn deposits, which would also mine the Charters Towers goldfield.

In late 2006, Iluka Resources completed the Douglas mineral sands located 40 kilometres south west of Horsham in Victoria. Total capital expenditure on the project was around \$284 million and annual production capacity is 98 000 tonnes of rutile, 135 000 tonnes of zircon and 200 000 tonnes of ilmenite.

In terms of capital expenditure, a number of smaller projects across a range of commodities were completed in the six months to April 2007. These include Xstrata's \$38 million, Northern 3500 underground ore body (annual capacity of 22 000 tonnes of copper concentrates), Xstrata and Teck Cominco's \$28 million restart of the Lennard Shelf mine (70 000–80 000 tonnes of zinc) and Crescent Gold's \$15 million redevelopment of the Laverton mine (22 500 ounces of gold). Xstrata's 3500 tonne underground ore body is located near Mount Isa in north western Queensland. Lennard Shelf and Laverton are located in northern and south eastern Western Australia respectively.

advanced projects

At the end of April 2007, there were 91 projects at advanced stages of development included in ABARE's projects list (table 3) – these projects are either committed or under construction. This is three fewer than the number of advanced projects included in the October 2006 list. Despite the slight reduction in the number of advanced projects in the April 2007 list, there were still around 18 projects either newly committed or entered the list at an advanced stage in that six month period.

The announced capital expenditure of the 91 advanced projects at the end of April 2007 sums to \$43.4 billion.

However, it should be noted that even projects that have reached the committed stage may be deferred, modified or even cancelled if economic or competitive circumstances change sufficiently. This is particularly relevant in the current period of rapid project development in which the mineral resources sector is experiencing significant difficulties in securing sufficient inputs including materials, equipment, skilled labour and professionals. In this environment, where demand from developers is rising faster than supply, the impact on project development is being manifested in delays to scheduled completion dates for projects and in increases in project capital costs.

In line with previous ABARE project listings, current investment intentions in the Australian mineral resources sector, as reflected in the large number and record value of minerals and energy projects committed to or under construction, continue to bode well for the sector's growth over the next few years.

The 91 advanced projects as at April 2007 indicate continued expansion across most of the minerals and energy industry spectrum.

advanced energy projects

Energy developments account for 39 of the 91 advanced projects (43 per cent) and around 39 per cent (or \$16.8 billion) of the estimated capital cost of \$43.4 billion for all of the advanced projects (table 3).

Seven large petroleum developments – five of them operated by Woodside – together with one natural gas pipeline project account for just over half of the total value of energy projects. The largest of these projects is the \$2.4 billion North West Shelf Extension Project in Western Australia, which involves the construction of a fifth LNG processing train, with gross annual capacity of 4.2 million tonnes of LNG. The fifth train is currently under construction and is expected to be completed toward the end of 2008. Two new offshore oilfield developments in the Carnarvon Basin in Western Australia – Vincent (\$1 billion) and Stybarrow (\$803 million) – are expected to add around 180 000 barrels a day of crude oil production capacity. Vincent (Woodside operated) and Stybarrow (BHP Billiton operated) are expected to begin production in 2008. The other four petroleum projects are the \$1.6 billion Angel gas and condensate field in the Carnarvon Basin, scheduled for completion in 2008; the \$1.1 billion Otway gas project in offshore Victoria, expected to be completed in mid-2007; the \$800 million Perseus-over-Goodwyn project, aimed at enabling full utilisation of the existing Goodwyn gas platform; and the \$620 million offshore Blacktip gasfield project in the Bonaparte Basin south west of Darwin scheduled for completion in 2009. The gas pipeline project is stage 5A of the Dampier-Bunbury pipeline expansion (\$700 million).

It is noteworthy that almost all of these large advanced petroleum projects are scheduled to be completed by the end of 2008.

Coal mine, and coal infrastructure, projects account for a further 14 per cent (or \$6.1 billion) of the estimated capital cost of \$43.4 billion for all advanced projects. The largest coal mine development, in terms of capital cost, is the \$1.1 billion Dawson project (Anglo Coal Australia/Mitsui), south west of Gladstone. This is an expansion project that is expected to add around 5.7 million tonnes of coking and thermal coal capacity, commencing toward the end of 2007. Anglo Coal/Mitsui is also developing the large new Lake Lindsay opencut mine (capital cost \$690 million) near German Creek in central Queensland. The mine is expected to commence production in 2008, with output

3 advanced projects, april 2007 – number and estimated capital cost, by state

	energy projects		mining projects		minerals processing		total	
	no.	\$m	no.	\$m	no.	\$m	no.	\$m
New South Wales	4	601	3	259	2	460	9	1 320
Victoria	4	1 402	1	120	0	0	5	1 522
Queensland	17	5 914	7	975	3	799	27	7 688
Western Australia	10	8 531	26	19 367	0	0	36	27 898
South Australia	1	55	5	1 325	0	0	6	1 380
Tasmania	0	0	1	77	0	0	1	77
Northern Territory	3	262	3	245	1	3 000	7	3 508
Australia	39	16 766	46	22 368	6	4 259	91	43 393

development projects

subsequently building up to full capacity of around 4 million tonnes a year, mainly of hard coking and PCI coals. Rio Tinto is committed to developing its \$900 million Clermont opencut mine as a replacement for the existing Blair Athol mine. The Clermont mine is scheduled to be commissioned in 2010, with output expected to be around 12 million tonnes a year of thermal coal. Apart from those listed above, six other advanced coal mine developments in Queensland and New South Wales are expected to raise coal production capacity by around 9 million tonnes a year in the next two to three years. The combined capital cost of these six projects is \$1.1 billion.

The large number of coal projects recently commissioned and scheduled for completion in the short to medium term has provided the impetus for expanded coal infrastructure (rail and coal terminal) capacity. At the end of April 2007, there were five coal terminal expansions and three rail expansions, all in Queensland, either committed or under construction. These expansions, most of which are scheduled to be completed before the end of 2008, have an estimated capital cost of \$2.3 billion.

advanced metal mining projects

At the end of April 2007, there were 46 advanced minerals mining projects collectively valued at around \$22.4 billion. Over half of these projects are located in Western Australia and comprise almost 90 per cent (\$19.4 billion) of the estimated total capital expenditure. Nine metal mining projects – seven iron ore, one nickel and one diamond project – account for around 85 per cent (\$16.4 billion) of committed capital expenditure to metal mining in Western Australia.

In the six months to April 2007, three iron ore projects, with an estimated capital expenditure of \$5.9 billion were added to the advanced projects list. The largest of these was BHP Billiton's Rapid Growth 4 expansion (\$2.8 billion), which will add 26 million tonnes of production capacity when complete in 2010. Fortescue Metals Group is progressing its 45 million tonnes a year Pilbara Iron Ore project at a total capital cost of \$2.78 billion. The project is due for completion in early 2008 and includes construction of a dedicated rail line and port. Finally, Rio Tinto has given its approval to the expansion of the Cape Lambert Port near Dampier. The upgrade will cost \$1.12 billion and provide Rio Tinto, with an additional 25 million tonnes of iron ore export capacity. In addition, BHP Billiton and Rio Tinto are progressing another four iron ore projects, with a collective capital expenditure of \$5 billion.

BHP Billiton's Rapid Growth 3 project is under construction at a capital cost of about \$2 billion. The project involves the expansion of Area C mining and upgrading associated rail and port infrastructure at Port Hedland. The Rapid Growth 3 project is due to be completed at the end of 2007 and will add 20 million tonnes of production capacity. Rio Tinto is expanding its Dampier Port (\$1.04 billion) and Yandicoogina mine (\$688 million), which will add annual capacity of 24 million tonnes and 16 million tonnes respectively. Rio Tinto is also constructing the \$1.27 billion first stage of the Hope Downs project, which will add 22 million tonnes of production and export capacity.

The significant growth in planned capital expenditure on iron ore projects reflects significant increases in iron ore prices over the past five years and the prospect of continued strong demand growth. Much of the projected growth in traded iron ore is expected to emanate from China as increases in its domestic production fail to keep pace with increased demand associated with higher steel output. In addition, the healthy outlook for iron ore is encouraging new participants to the industry, such as Fortescue Metals Group.

The most notable advanced gold project is Newmont and AngloGold Ashanti's \$2 billion redevelopment of the Boddington gold mine near Pinjarra in Western Australia. The redevelopment of Boddington is scheduled to be completed in 2008, with an annual capacity of 900 000 ounces of gold and 30 000 tonnes of copper. Eight other gold projects located in New South Wales, Victoria, Queensland and Western Australia are either committed or under construction, at a combined capital cost of \$556 million.

There are five copper projects currently under construction, the largest of which is Oxiana's Prominent Hill project in South Australia and Rio Tinto's expansion of its North Parkes mine in central New South Wales. Prominent Hill is a greenfield project located south east of Coober Pedy and is due for completion in late 2008. The \$775 million project will produce 104 000 tonnes of copper in concentrates, 114 000 ounces of gold and 420 000 ounces of silver. In central New South Wales, Rio Tinto is undertaking a \$211 million upgrade of its Northparkes mine, which is due to be completed in 2009. The upgrade to Northparkes will not result in an increase in capacity, but will allow for production at the mine to continue until 2016.

The largest advanced nickel project is BHP Billiton's Ravensthorpe development near Esperance in Western Australia. The project has an estimated capital cost of \$2.9 billion, an increase of \$650 million from the announced figure reported in the October 2006 listing. The Ravensthorpe development will have a productive capacity of 50 000 tonnes and 1400 tonnes of copper when complete in early 2008.

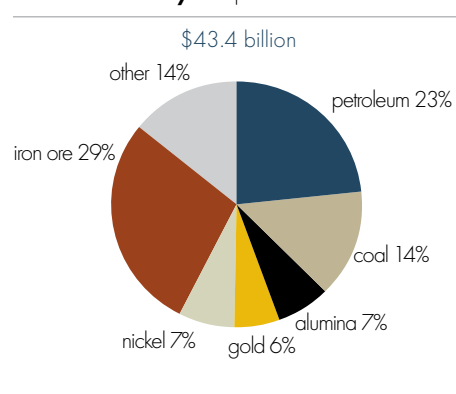
advanced minerals processing projects

At the end of April 2007, there were six advanced minerals processing projects – the same projects that were listed in October 2006. However, combined capital expenditure of these projects is \$4.3 billion, an increase of \$0.6 billion from the figure quoted in the October 2006 listing. The higher capital expenditure reflects cost increases at the two largest listed projects: the \$3 billion Alcan refinery expansion (cost increase of \$500 million) and the \$731 million Yabulu extension project (\$115 million). The expansion of Alcan's alumina refinery at Gove in the Northern Territory is almost complete, with commissioning scheduled for mid-2007. In Townsville, BHP Billiton's \$731 million expansion of its Yabulu nickel refinery is scheduled for completion in early 2008 and will refine nickel produced at the Ravensthorpe nickel mine development in Western Australia.

capital value of all projects

Figure D provides a breakdown of proposed capital expenditure on advanced projects, by major commodity grouping. Figure E shows the estimated capital cost on a state basis. At the end of April 2007, the number of advanced projects was at a historically high level (figure F), as was the total value (in 2006 dollars) of advanced projects (figure G). The average value of advanced projects at the end of April 2007 (\$471 million) was just a little below the average for all years since 1995 (\$375 million in 2006-07 dollars) – figure H.

fig D value of advanced projects, by commodity april 2007



development projects

fig E **value of advanced projects, by state**
april 2007

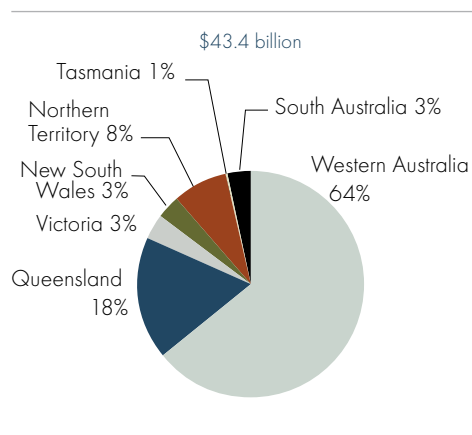


fig F **number of advanced projects**

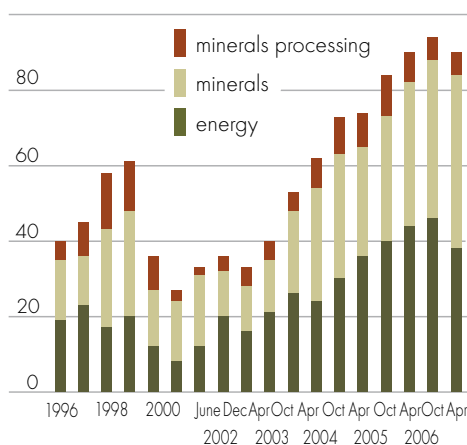
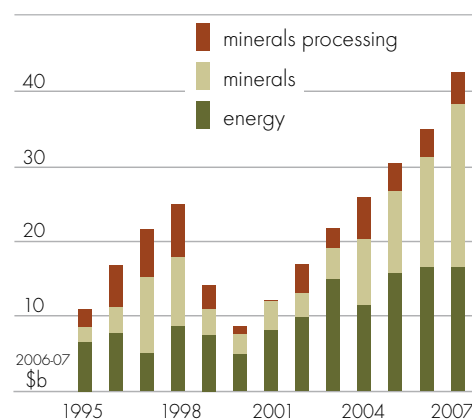


fig G **value of advanced projects**



less advanced projects

Projects in the less advanced planning category are either still undergoing feasibility study (in some selected cases, prefeasibility study) or no definite decision has been taken on development following the completion of a feasibility study. Some of these projects cannot proceed for several years and may confront changes in economic or competitive conditions, or may be targeting the same emerging market opportunity, necessitating rescheduling. In addition, securing finance for project development – even for high quality projects that have a high probability of success – can present problems, particularly if there is perceived to be excess global supply and/or an uncertain demand outlook.

Also, with an exceptionally large number of minerals and energy projects currently committed or under development in the next few years, competition for skilled labor and materials and the attendant cost pressures are unlikely to ease in the short to medium term. This makes it likely that the feasibility of many less advanced projects will need to be re-examined. It may also mean that, from a market perspective, some project developments may be deferred beyond their optimal startup dates.

However, despite the uncertainty that attaches to projects at these earlier stages of consideration, the significant number of large scale projects at less advanced planning stages that are under active consideration for development is expected to provide a firm platform for future growth in the medium term and beyond.

Of the record 279 projects in ABARE's April 2007 projects list, 67 per cent (188 projects) remain uncommitted. Table 4 contains a summary of the numbers and commodity distribution of the 188 uncommitted projects together with their potential capital expenditure. The potential capital expenditure data should be used as a rough guide only. Capital expenditure data for many early stage projects are either not available or, if available, will change significantly if they do proceed to development. In addition, changes in market conditions can often lead to significant variations in capital expenditure estimates.

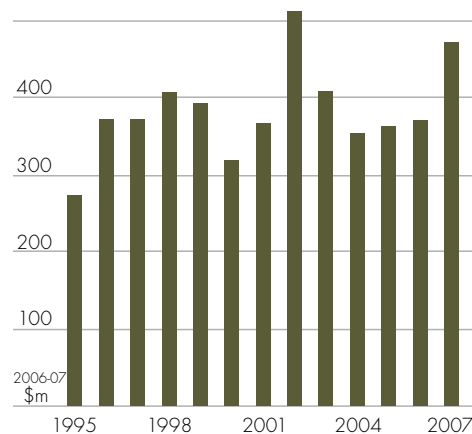
However, most of the projects that will ultimately proceed to development in the medium term are included in ABARE's current list of 188 less advanced projects.

development projects

Among the more notable large scale projects in ABARE's April 2007 list that are still undergoing feasibility studies are seven proposed LNG developments that, collectively, could add around 50 million tonnes of annual LNG production capacity in the medium to long term. The project most likely to be developed first is Woodside's Pluto gas discovery. Woodside has not yet made a final investment decision on the project; however, it has approved the expenditure of \$1.4 billion so that initial site development can commence and equipment with long lead times can be ordered.

The largest less advanced metal mining project is BHP Billiton's proposed \$6 billion Olympic Dam expansion, currently undergoing prefeasibility studies. This project aims to more than double the mine's current

fig H average value of advanced projects



4 number of less advanced projects – april 2007

	NSW	Vic	Qld	WA	SA	Tas	NT	Aust	potential capital expend. \$m
	no.	no.	no.	no.	no.	no.	no.	no.	
mining – energy projects									
black coal	16	0	23	0	0	0	0	39	10 270
coal seam methane	1	0	0	0	0	0	0	1	35
petroleum	0	4	6	6	0	0	7	23	50 310
uranium	0	0	3	1	3	0	1	8	835
sub-total	17	4	32	7	3	0	8	71	61 450
mining – minerals projects									
bauxite	0	0	1	0	0	0	0	1	700
copper	2	0	4	1	2	0	0	9	7 092
gold	4	1	4	8	2	0	2	21	2 277
iron ore	0	0	0	20	0	0	0	20	15 827
lead-zinc-silver	5	0	2	0	0	0	1	8	860
mineral sands	3	3	0	4	1	0	0	11	1 086
nickel	0	0	3	14	0	0	0	17	7 167
rare earths	0	0	0	0	0	0	1	1	150
tin	0	0	0	0	0	2	0	2	78
vanadium	0	0	0	2	0	0	0	2	546
other commodities	1	0	1	5	0	1	2	10	1 925
subtotal	15	4	15	54	5	3	6	102	37 708
minerals processing									
alumina	0	0	3	2	0	0	0	5	8 900
aluminium	1	1	0	0	0	0	0	2	2 250
crude iron and steel	1	0	1	0	0	0	0	2	684
magnesium	0	1	0	0	0	0	0	1	1 000
nickel	0	0	0	2	0	0	0	2	na
titanium minerals	1	0	0	1	0	0	0	2	142
zinc	0	0	1	0	0	0	0	1	na
subtotal	3	2	5	5	0	0	0	15	12 976
total	35	10	52	66	8	3	14	188	112 134

development projects

output of copper, uranium, gold and silver. Among the less advanced iron ore projects, seven have an estimated capital expenditure of \$1 billion or more. These are: Australasian Resources Balmoral South magnetite project (\$2.8 billion); Mineralogy's Cape Preston stage 1 and stage 2 mine and pellet plant (estimated capital cost of \$2.6 billion and \$1.3 billion respectively); Murchison Metals' Jack Hills stage 2 mine (\$1.8 billion); Yilgarn's Oakajee Port and Rail Project (\$2 billion); Atlas Iron's Pardoo magnetite project (\$1 billion); and Gindalbie Karara magnetite mine (\$1 billion).

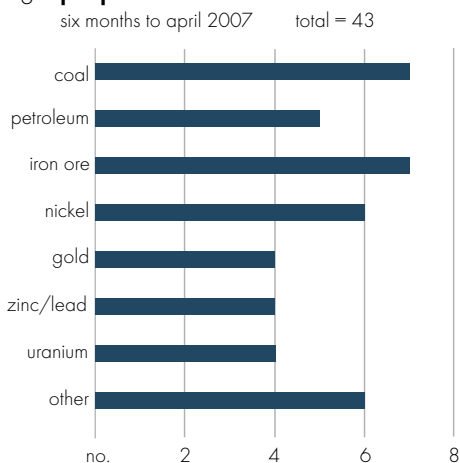
projects new to abare's list

There are 43 projects (both advanced and less advanced) that are new to ABARE's list since October 2006. In the two year period from the end of April 2005 to the end of April 2007, over 166 projects have been added to ABARE's project list. The number of newly listed projects in this timespan is unprecedented and is another indication of the

current high level of investment interest in the mineral resources sector. Figure 1 provides a summary of the 43 newly listed projects in the six months ended April 2007, by commodity category. Of the 43 projects added to the list, nine are either committed or already under construction.

Among the more notable less advanced projects new to the list are the \$1 billion gas to liquids project in Queensland and a \$2.8 billion iron ore project in Western Australia. Arrow Energy and Alcan are proposing to build a gas to liquids plant capable of producing 14 000 barrels a day of low sulfur diesel, 5000 barrels a day of naphtha and 1000 barrels a day of liquefied petroleum gas. A prefeasibility study has been completed on the project; a feasibility and front end engineering and design study is yet to commence. The proponents have not yet finalised the exact location of the project, although it will be located on the coast of Central Queensland.

fig 1 projects added to list



Australasian Resources is undertaking a feasibility study on the Balmoral South project, which has a total capital cost of \$2.76 billion. The current project proposal involves the construction of a mine and processing plant capable of producing sufficient iron ore to produce 5.2 million tonnes of concentrates, 4.5 million tonnes of pellets and 1.45 million tonnes of hot briquette iron. In addition to the Balmoral South project, there have been another five iron ore projects added to the April 2007 listing. These include the second stages of the Cape Preston and Hope Downs projects, stages 1 and 2 of the Wiluna West project and the Yalgoo iron project.