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PROSPECT

Top honours

The award-winning companies driving Western Australia's resources industry

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From the Director General

With change comes opportunity

The creation of two new State Government departments with roles relating to mines and petroleum comes at a vital time for this valuable industry.

The new Department of Mines and Petroleum and Department of State Development will result from the restructure of the existing Department of Industry and Resources and Department of Consumer and Employment Protection. The process will also create a new Department of Commerce.

With the global economic crisis affecting business confidence and placing constraints on capital available for new projects, it is more important than ever for the right decisions to be made for an industry that drives much of Western Australia's growth.

The latest sales statistics show the value of the State's minerals and petroleum was a record A$58.6 billion in 2007-08, which was a 9 per cent jump on last year's performance.

It is unrealistic to think the world financial crisis will not affect opportunities going forward, in particular the resilience of China and other growth markets will be influential in determining Western Australia's growth path.

I look forward to working with new Mines and Petroleum Minister Norman Moore on achieving the vision he has outlined in this issue of *Prospect* on issues such as streamlining the approvals process for new projects.

Government, industry and the community must work together productively to ensure we take best advantage of the State's incredible resource base if we are to effectively face up to our significant challenges.

Anne Nolan
DIRECTOR GENERAL

Prospect
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***Cover photo:** Alumina producer Alcoa was one of the winners of this year's WA Industry and Export Awards.*

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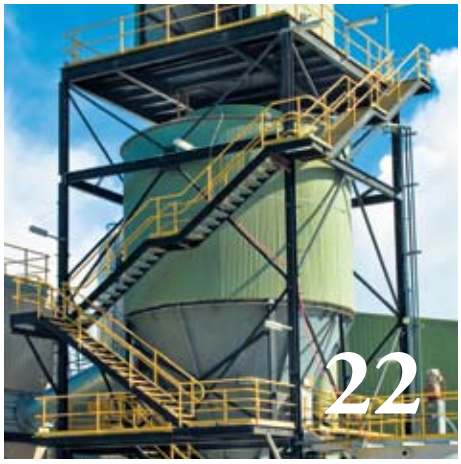

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ATLAS
breaks new ground

Western Australia's newest iron ore player in the resources-rich Pilbara region, Atlas Iron, recently started mining at its Pardoo project, 75 km east of Port Hedland and about 1700 km north of Perth.

The company is walking in the land of the giants – BHP Billiton, Rio Tinto, and now Fortescue Metals Group (FMG) – but Managing Director David Flanagan is confident his company, as a smaller operator, has a competitive edge.

"We can offer a better customised service to a customer," he said.

"One of the reasons why the Chinese steel mills like us is because we can be flexible."

He said Atlas could provide different volumes and ore types at short notice, which larger companies could not.

"We can make a decision on a contract very quickly," he said. "We can provide flexibility with payment and freight. Probably with our business we can be more dynamic."

Despite his confidence, Atlas Iron has started producing ore in a decidedly changed market.

The State's robust iron ore sector reported record sales value of A$20.5 billion for the last financial year, which was a 30 per cent rise from 2006-07. The quantity sold also broke records in 2007-08, increasing by nearly 13 per cent to reach 291 million tonnes.

However, in the wake of the global financial crisis, the value of contract ore fell below the spot market price.

Faced with only a two-week window to get its ore to port, Atlas has been forced to sell on the spot market.

"It is very enjoyable to have a mine and be out there and digging holes, feeling like you're making a contribution to the nation-building side of the mining industry," Mr Flanagan said.

"But I suppose we've done it in the middle of a pretty ordinary time in the iron ore market, unfortunately.

"But the board and the management have taken the view that there is still sufficient value out there in the market.

"Our product is saleable, we've got good expressions of interest and we'll complete those agreements and have a good project."

The company plans to ship out a million tonnes in 2009 from Pardoo and start production at its second project, Abydos, 120km south of Port Hedland, in 2010, at a rate of three million tonnes per annum (mtpa). Pardoo will also lift to 3 mtpa and by 2012 the combined projects will yield 12 mtpa.

Atlas Iron started about four years ago when Mr Flanagan, then a geologist, "got an urge" to list a mining company.

"The first thing you've got to do is have a good, long chat with your wife," he said.

"Sarah was really good about it.

"She literally said 'maybe this is a once-in-a-lifetime opportunity that you just have to grab'."

The timing was good, with the start of Western Australia's mining boom just around the corner. Unfortunately that boom would be over by the time Atlas started producing ore.

"At the time we didn't feel like we were at the beginning of the resources boom. In fact, we raised A$4.5 million and it was not a walk in the park to raise A$4.5 million," he said.

Mr Flanagan said there was some difficulty raising the funds because other companies had tried to get off the ground but had become "pretty big disappointments".

"We (he and his family) decided that if it didn't get off the ground it would be ok and I'd go back to work as a geologist anywhere and we would rebuild.

"But we did, we got listed.

"There were some really good people around the fringes of Atlas which made me feel really comfortable.

"I felt quite confident that we would get this over the line."

Once the company was listed, however, the next challenge was the weather.

"Probably the first thing we had to deal with was the hottest summer in the Pilbara for 70 years," he said.

"During the very first drilling program I went up and stayed with the guys and it got down to 35 degrees at night."

Mr Flanagan said the biggest milestone for the company since its inception was a deal with FMG to get access to its Port Hedland port.

"Nothing compares to that," he said.

The company has also been buoyed by the news that the Federal Government has agreed with the National Competition Commission's recommendation that Rio Tinto and BHP Billiton allow third party access to their rail networks.

Mr Flanagan said the decision was exciting but it would still not deliver the rail haulage access that third parties wanted in the next six to 12 months.

It has been a long road but Atlas Iron has now joined the ranks of successful Pilbara iron ore producers.

He said he expected Rio Tinto and BHP to fight the decision.

"The majors should look at this as an opportunity to generate more revenue and more security in their business," he said.

"I don't see why the juniors can't be sufficiently flexible and dynamic, such that there is no business interruption risk to the majors."

The Goldsworthy rail line runs past Atlas' Pardoo project, from which ore is currently transported to Port Hedland by road.

Mr Flanagan said Atlas Iron did not see any business interruption risks to BHP Billiton by increased access to the line.

"By our measure, Goldsworthy its running at less than 15 per cent of its design capacity," he said.

"We've got road trains running down a highway when that ore could be on the railway," he said.

"It's heartbreaking to drive down the road in trucks when there's a railway line there doing absolutely nothing."

THE ATLAS VISION

- Plans to ship a million tonnes of iron ore from Pardoo in 2009
- Production at Abydos deposit to begin in 2010 at rate of 3 million tonnes per annum
- Pardoo production to lift to 3 mtpa
- Combined production to yield 12 mtpa by 2012

MINING

immersed in export excellence

A supplier of operator training simulators to the mining and earth-moving industries has been recognised for its excellence in capturing a dominant share of the global market.

Perth-based company Immersive Technologies has taken out the Premier's Award for Excellence, the major prize at this year's WA Industry and Export Awards. The company also received an award in the Education and Training Export category.

Immersive Technologies Marketing Communications Manager, Richard Calautti, said that in less than 15 years the company had become the world's leading supplier of training simulators, capturing more than 90 per cent share of the international market.

"With over 380 simulator modules at 155 locations in 23 countries, our vision is to make every mining and equipment operator in the world safer," he said.

"Our training simulators are now considered vital to many of the world's leading mining companies; they are increasing safety and efficiency, while decreasing maintenance costs and resources companies' overall cost per tonne."

Mr Calautti said the awards were an excellent opportunity to gain recognition for the outstanding work done by the company's staff located in Australia and internationally.

"We are very proud to receive the Premier's Award for Excellence and also the Education and Training Export Award, given the standard of other nominated companies."

Western Australian Premier Colin Barnett said the company was a great example of a local business making a valuable contribution to the State's economic development.

"It is outstanding to see a local company like Immersive Technologies building new market opportunities not only within Australia but also internationally," he said.

"With many pressures on the Australian manufacturing sector it is important to remain internationally competitive, and Immersive Technologies' commitment to excellence had been recognised through this award."

Immersive Technologies services companies located across the world including Australia, the United States, South Africa, Jordan and South America. It is also starting to make its mark in other markets such as India, Europe and the Middle East.

Other category winners in the resources industry included Alcoa of Australia, Micromine and Neptune Marine Services.

Immersive Technologies Chief Executive Officer Peter Salfinger (left) with WA Premier Colin Barnett.

The Alcoa team celebrate with their award.

Premier Colin Barnett and award winner Micromine Chief Executive Peter Rossdeutscher.

ALCOA

Alcoa was awarded the Minerals and Energy Export Award in recognition of its enormous contribution to the State's economy. Alcoa Sales Manager Ian Nokes said the company's exports accounted for about 5 per cent of the State's total exports.

"Alcoa is proud to be recognised by winning this award as it reflects the hard work by all employees which has gone into expanding and growing the business since inception," he said.

Alcoa operates the world's largest integrated bauxite mining, alumina refining and aluminium smelting system in Australia.

Mr Nokes said the company contributed almost A$5 billion in exports nationally in 2007 and was expecting exports to increase by A$160 million each year.

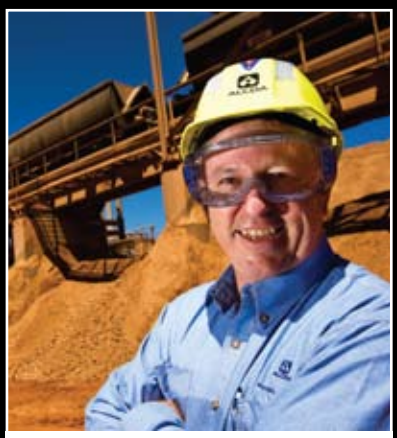
"We regularly visit targeted regions in South East Asia and North Asia as well as the Middle East, China, North America and South America, to meet with the management of operating smelters, coil and rolling mills and various other end users and trading companies within the sector," he said.

He said products exported included alumina, non metallurgical alumina and aluminium ingots.

Western Australia-based Panoramic Resources also received a special commendation in the Minerals and Energy Export Award category for its exports of premium nickel concentrate. Since 2004, Panoramic Resources has generated A$630 million in export sales revenue.

Panoramic Resources Export and Sales Manager Tim Shervington (left) accepts his Special Commendation from National Director of the WA Australian Institute of Export Board, Michael O'Callaghan.

Training in an Immersive Technologies simulator has been found to increase operator efficiency and lower mining costs per tonne.



Alumina produced by Alcoa in WA accounts for about 11 per cent of world demand.

A Neptune Marine Services welder keeps a close eye on proceedings.

Neptune Marine Services General Manager Colin Murphy (left) accepts his award from Rio Tinto Chief Executive Sam Walsh.

MICROMINE

Mining and exploration software solution services provider Micromine took out the C.Y. O'Connor Award for Excellence in Engineering.

As one of the leading innovators in the resources industry, Micromine engineers produce dynamic solutions for the entire mining value chain.

Micromine Chief Executive Officer Peter Rossdeutscher said he attributed much of Micromine's international success to tailoring solutions to specific markets.

"When taking a product or service abroad, you can't simply transplant what works here in Australia to a market overseas. Micromine tailors its solutions to the specific geographies that it services," he said.

"This ensures Micromine is delivering a solution that not only meets current demands but also pre-empts the future needs of the global resources industry.

"We have 13 fully owned and operated offices, supporting more than 4000 clients in 11 of the major exploration and mining countries in the world."

Mr Rossdeutscher said the company was now in the process of developing its next product, Mastermine, an A$11.26 million initiative.

He said the awards were a very good fit for Micromine as they showcased innovative organisations that were leaders in the international arena.

NEPTUNE MARINE SERVICES

Neptune Marine Services received the Innovation Excellence Award for its patented dry underwater welding technology NEPSYS.

Founded in 2003, the company has grown from a local staff of six to more than 400 employees across nine companies in Australia, Asia, the United Kingdom and the United States.

Managing Director and Chief Executive Officer Christian Lange said Neptune's primary focus was the offshore oil and gas sector.

"Our expanding scope of capabilities means that we are one of the few service providers in the oil and gas and marine services sectors that can deliver tailored solutions to meet our customers' specific requirements," he said.

"Our success in establishing an international presence in key energy markets is based on hard work and the ability to adapt tough offshore situations that can't always be planned for in the office or workshop."

Mr Lange said the WA Industry and Export Awards helped enhance the company's global achievements in the offshore oil and gas sector.

Other resources-based finalists in the Innovation Excellence Award category included Innovative Conveying Systems International (ICSI) and VDM Consulting.

ICSI is a Western Australian designer, manufacturer and distributor of an enclosed belt conveying system while VDM is an engineering consultancy firm with operations across Australia, Vietnam, Dubai and India.

The WA Industry and Export Awards, now celebrating the 20th year of operation, are the State's most prestigious business awards, acknowledging the innovation, hard work and success of businesses, large and small, in reaching new markets. All of Western Australia's export category winners will automatically compete as finalists in the Australian Export Awards, to be held in Melbourne in December. ■

WESTERN AUSTRALIA Inventor of the Year 2008

Innovative mesh set to increase mine safety

High Energy Absorption Mesh is designed to absorb energy during underground mining.

A new mesh and cable product developed by a Western Australian researcher to increase underground mine safety has been given a rock-solid stamp of approval.

High Energy Absorption (HEA) Mesh won Professor Yves Potvin, from the Australian Centre for Geomechanics, the Ready for Market Category in this year's WA Inventor of the Year Award.

Professor Potvin said the HEA Mesh was developed to tackle the challenges presented by deep and high stress mining conditions and mechanised mining.

"The sudden and powerful nature of mining-induced seismic events makes them extremely hazardous for a mining company's workforce, resources and productivity," he said.

"HEA Mesh is designed to promote an efficient load-sharing between the surface support and the reinforcement. As the rock surface moves, in wall closure, it pulls the mesh, which is contained by the cable web.

"In comparison to existing ground support systems such as mesh and shotcrete, HEA Mesh is cost-effective, flexible, can be rapidly installed and is capable of supporting heavy loads.

"These features present an effective force to address extreme ground conditions such as high energy seismic events and squeezing ground."

Professor Potvin described the HEA Mesh as a cable bolt that was laced and overlaid with a sheet of regular or crinkled weld mesh.

"HEA Mesh is currently at the late stage of development and Australian steel making company OneSteel Ltd is investigating the practicalities and economics of its commercial nature," he said.

"The product will undergo further laboratory and field trials early next year to refine the effectiveness of the cable mesh technology.

"The product is expected to be readily embraced by industry."

Selected from three category finalists, Professor Potvin said he was delighted to be awarded the Ready for Market Category award.

"We are pleased to be acknowledged by the Department of Industry and Resources and Inventor of the Year program for our innovation in technology and design," he said.

The Western Australian Inventor of the Year Awards are Australia's richest such awards, with a total prize pool valued in excess of A$300,000.

The Ready to Market Category is open to organisations and individuals that have developed a product or service that is ready to be licensed, manufactured or marketed but needs funding to take that step.

The Inventor of the Year awards aim to help industry, government, academia and schools work collaboratively to foster an environment of innovation, as well as assist the promotion of innovation. ■

Professor Yves Potvin (left) with Science and Innovation Minister Troy Buswell.

MOORE
faces up to the challenges

Mines and Petroleum Minister Norman Moore

The new Western Australian Government sworn in during September this year has wasted little time in outlining a vision for the State's vital mining and petroleum industry.

One of the first orders of business for the Government, which consists of Liberals, Nationals and an independent, has been to create a department solely focused on resources.

Administered by Minister Norman Moore, the Department of Mines and Petroleum will take on the mining and petroleum regulatory role of the Department of Industry and Resources, as well as the resources safety responsibilities from the Department of Consumer and Employment Protection.

The restructure will also create a new Department of State Development and the Department of Commerce, which will incorporate the current functions of the Department of Consumer and Employment Protection.

Mr Moore has a long history in resources. He grew up in Kalgoorlie and his father worked in the mining industry all his life.

He has represented the Mining and Pastoral electorate for 30 years and was also the minister responsible for mining under the Liberal Government of Richard Court between 1997 and 2001.

While admitting to some concerns about how the current financial crisis might impact the State, the Minister said the resources industry was doing extremely well at present.

"It doesn't matter where you look, from iron ore through to nickel, through to alumina, coal – all our companies are very efficient and very productive," he said.

"When you add to that stable government, competent regulatory regimes, our geographical location with respect to Asia, particularly to China and Japan, then that gives us a significant advantage."

Mr Moore said there was however significant room for improvement in how the State Government administered the mines and petroleum industry.

Step one in improving this will be an overhaul of the approvals process for new projects, to remove perceived delays and inefficiencies.

This is an area that has attracted significant criticism in recent years, and a recent global survey ranked Western Australia as the riskiest destination for exploration investment in Australia.

Mr Moore said the situation needed to be rectified for the future of the State.

"It's all very well to have a burgeoning resources sector, but you've got to keep remembering that every mine and every oil well and every gas reserve is finite and eventually they'll run out," Mr Moore said.

NORMAN MOORE'S BACKGROUND

- Born in Kalgoorlie to a mining family
- Member of Parliament since 1977
- Served as minister responsible for mining between 1997 and 2001
- Shadow minister for mining on four occasions
- Current Leader of the Government in the Legislative Council

"So we've got to keep encouraging new investment right across the board so that the mines of tomorrow are found today.

"That's my first priority in terms of my role – we need to be doing that so newcomers to the system, for example the Mid West iron ore producers, can get some certainty for the future."

Increasing exploration for new minerals and petroleum is also high on the list of priorities for the new Government. According to the Minister, this issue is interlinked with the approvals delay.

"The concern I have is that most of the exploration today has been on brownfields sites and there's been little exploration in greenfields sites," he said.

"This has been brought about by the approvals delay, by native title issues, Aboriginal heritage issues, environmental issues, all of which are important of course, but the timelines of the approvals process are totally unacceptable."

The Minister has investigated the subsidy for exploration activity on offer in South Australia, as a possible option for Western Australia.

"I'm more inclined though to the view that if there's funds to be made available for that kind of incentive, it ought perhaps to go to the Geological Survey, so that we can significantly improve the State's intellectual knowledge, if you like, of our mineral resources," he said.

Uranium played a large role in public discussions in the lead-up to the recent election, with the Liberals and Nationals both in favour of ending the previous Labor Government's effective ban on extracting the mineral.

The new Government is now in the process of formulating rules and regulations for a prospective new industry.

Mr Moore said that the past lack of uranium mining in the State had led to a lack of expertise about the mineral within Government agencies.

This would be overcome by learning from South Australia and the Northern Territory, which have long mined uranium, and liaising with the Commonwealth on export approval.

"Whatever we need to do to acquire the expertise on uranium mining we will do...I don't really know when the first yellowcake will be produced, but I'm confident that within a couple of years there will be at least one project up and running," Mr Moore said.

He said the economic contribution of a new uranium sector would be significant for the State.

"The tonnages are not big but the value is," he said.

"It will have a benefit for Western Australia in terms of giving companies the economic purse that they will be seeking. It means more jobs, more investment and from the Government's point of view, it means more royalties and more investment for the taxpayers."

An agreement struck between the Liberals and Nationals in order to form Government will see much of the royalties from future mining and petroleum activity directed to regional Western Australia.

The Nationals' Royalties for Regions plan requires the Government to spend 25 per cent of royalties in regional Western Australia.

Mr Moore said the plan would ensure that money found its way back to the regions where mining and petroleum wealth was created.

And while it is expected to be the main mechanism for creating a greater level of regional development in the State during the next few years, the Minister said he was supportive of other plans

and policies that might contribute to the same aims.

These include revising the State Agreement process for mining and petroleum projects to include more social and economic benefits for surrounding communities.

This was also a policy of the previous State Government, but Mr Moore said the historic level of community engagement by resources companies had been dramatically higher.

"If you go back and look at the original State Agreements, the ones that relate to Mount Newman Iron Ore or Hamersley Iron Ore, they actually had obligations on the company to build every bit of infrastructure in town, to the point where roads, hospitals and schools and police stations were included in the State Agreement," he said.

"And I think there's a lot of merit in that because it made it very clear what the company's obligations were and what the Government's were."

The Minister said there was a "desperate need" to do something about most of the communities surrounding resources operations and acknowledged that the fly-in, fly-out nature of many projects had hampered sustainable community development in the regions.

He is not, however, convinced it is feasible to compel companies to abandon fly-in, fly-out, or that it will solve regional Western Australia's problems.

"There's no point just saying we don't like fly-in, fly-out so we're going to make the companies, through a State Agreement Act, house their citizens in the bush," he said.

"If you're going to do that, you've got to then as a Government provide the amenity of life that people seek.

"The lifestyle in those regional centres could be equally attractive as the city, provided the Government has good schooling, good law and order in place, and the recreational amenities people want to use."

Though his background and political career have largely been focused on the resources industry, global conditions have not generally been kind to Mr Moore during his ministerial responsibilities for the industry.

His first stint coincided with the Asian financial crisis and his second has been accompanied by a full-scale global meltdown.

In conferring with mining and petroleum companies, the Minister said he had obtained varied opinions about what effect this would have on the State.

"Because most of the global growth is into China it will depend to a large extent, on the slowdown in the US economy and what effect that will have on Chinese production," he said.

"Some people tell us that it's a serious problem for China and it will have a consequential effect on the Western Australian resources industry. Others say that the domestic Chinese market growth is so strong that the American slowdown effect will not be so large in this corner of the world as it is elsewhere."

And regardless of future events, he believes the State owes a large debt to its mining and petroleum industry.

"I just have a fundamental belief that the industry has given Western Australia the opportunity to be one of the world's leading economies, and that the standard of living that Western Australians enjoy is dependent on a very successful resources sector," Mr Moore said. ■

Building a Stronger State

The world in which the Western Australian resources industry does business has changed dramatically in the past two months, but the Department of Industry and Resources' Acting Deputy Director General of State Development Anna Cronin has kept a close watch on these developments.

During this period considerable uncertainty has surrounded many resource companies' expansion plans and almost every day there have been reports of project postponements and job cutbacks.

Follow-on impacts are also being felt in industries which service mining and resource development.

These developments have significant implications for the work underway on policy issues in the Western Australian resources industry.

Other developments include the Federal Government accepting the recommendation of third-party access to some railways in the Pilbara, an emissions trading scheme scheduled to be introduced in 2010 and the restructure of DoIR.

Ms Cronin said a large part of the State Development Policy Group's role was to provide input on behalf of the department on resource sector issues to other government agencies.

"Working across government is one of the most important roles of the group," she said.

"We work co-operatively with other departments and agencies in providing information and input about a range of resource and industry-related issues.

"For example, the State Development Policy group has been working with the Department of Treasury and Finance to ensure that it has the most accurate information on the emissions intensity of resource activity, and therefore the impact of emissions trading in Western Australia, as it puts the State's case to the Federal Government.

"Western Australia stands to be most affected by the introduction of emissions trading and we've been providing information on the emissions intensity of iron ore, liquefied natural gas, coal, alumina and so on," she said.

Another major issue the State Development Policy Group has been involved in is infrastructure.

"We have provided considerable input to State Treasury about resource industry infrastructure issues such as the State's submission to the Federal Government's Infrastructure Australia process and third-party rail access in the Pilbara."

There are also significant changes occurring at DoIR with a restructure that will form three new departments, the Department of Mines and Petroleum, the Department of Commerce, and the Department of State Development.

The restructure will give the Department of Mines and Petroleum a stronger focus on the resources sector, returning the functions of mine safety from the Department of Consumer and Employment Protection.

An internal steering committee has been established within DoIR to provide advice on issues which need to be addressed in terms of the restructure.

As an Acting Deputy Director General, Ms Cronin is part of this committee along with other Deputy Directors General, corporate support managers and staff representatives.

"This committee has been doing a lot of work to facilitate the transition to the new departmental structures," Ms Cronin said.

DoIR's Acting Deputy Director General of State Development Policy, Anna Cronin, said working across government was an important part of her role.

She is no stranger to major change, having worked as an economic adviser in Federal and State governments.

As chief of staff to Victorian Premier Jeff Kennett, Ms Cronin, who studied economics at the Australian National University, was heavily involved in the tax reform process and the allocation of GST revenue to the States, as well as in Mr Kennett's implementation of major reform across many fronts.

Ms Cronin has recently made Western Australia home and is excited about her new role.

"Since I started in the department, I am very lucky to have worked with colleagues whose knowledge and experience in the resource sector and in government is second to none," she said.

"And it's great to be involved with the resources sector in Western Australia.

"Despite the current challenges, there's a real buzz about what's going on."

PILBARA

population tipped to take off

Western Australia's mining boom brought with it a population boom. Resources companies screamed for workers and they came flooding in from throughout the State, the nation and overseas.

According to the Australian Bureau of Statistics (ABS), from 2001 to 2006 alone, the number of people employed in the mining industry in Western Australia grew from about 30,000 people to about 40,000.

Up north in the Pilbara region, where the majority of the State's mineral and petroleum wealth lies, towns that had consistent, or declining populations, experienced an unprecedented level of population growth.

ABS data shows that between 2001 and 2006 the populations of the Pilbara towns of Paraburdoo and Dampier grew by 7.5 per cent and 6.2 per cent respectively.

Karratha's population in the same period rose from about 10,800 to 13,300 people. And the number of Perth-based fly-in, fly-out workers in the Pilbara increased from 526 to 1972.

The Pilbara is the leading resources region in Western Australia, accounting for 63 per cent of the value of Western Australia's minerals and energy production in 2007, and generating royalties of more than A$1.5 billion in the same period.

How long will the region's growth continue?

A population projection report from the Pilbara Industry's Community Council (PICC) attempts to answer that question.

Based on information from industry, the State Government and the Department of Industry and Resources, the report has projected population figures up to the year 2020 and was compiled in August 2008.

It predicts that resource-related employment in the Pilbara will grow from about 15,000 to above 30,000 from 2015.

The PICC is an initiative of the Western Australian Chamber of Minerals and Energy and is primarily focused on indigenous issues and the sustainability of Pilbara towns.

WA Chamber of Minerals and Energy Chief Executive Officer Reg Howard-Smith stated in the report that the PICC population projections would provide the best available data for government and industry on required planning and resource implications of the Pilbara's likely growth.

Highlights of the report include:

- Residential employment is projected to grow from 10,000 to 15,000 in 2015.
- The number of employees participating in fly-in, fly-out employment is projected to grow from 5000 to potentially 17,000 by 2015.
- With multiplier assumptions applied to the resident employment numbers, the Pilbara's population could reach over 45,000 by 2010 and exceed 50,000 by 2015.
- The total population across the region (resident; fly-in, fly-out; and construction) could rise from more than 60,000 in 2009 to more than 75,000 by 2012.

The Pilbara mining town of Pannawonica has recently been scheduled for a US$247 million upgrade by Rio Tinto.

PROJECTIONS FOR PILBARA TOWNS

- Karratha and Port Hedland to have 15,000 people each by 2015
- Port Hedland to grow faster than Karratha up to 2020
- Roebourne and Wickham to add a combined 1000 people by 2010
- Onslow to grow to 2500 people by 2015

The Pilbara is famous for the iron ore that first drew workers to the region in the 60s, and the iron ore sector still commands the greatest number of operating employees. Oil and gas projects use a great number of construction workers, but once established, employ fewer operating employees.

The PICC report has used conservative iron ore shipment figures of 700 million tonnes a year to calculate the employment projections. It has used a conservative figure to address any uncertainty about the timing, scale and market demand of iron ore output above that figure from 2015 to 2020.

The residential versus fly-in, fly-out workers projections are based on company judgments on how and where staff will be deployed as operations expand or contract.

It is expected that these assessments will change over time as expansion plans are realised, or, in the wake of global financial crisis, reassessed.

Township populations have also been projected and show Karratha and Port Hedland exceeding 15,000 people by 2015, with Port Hedland growing faster than Karratha between the years 2010 to 2015, and up to 2020.

Roebourne and Wickham are expected to record combined growth of 1000 people by 2010, taking the population from about 3000 to 4000, while Onslow will grow to about 2500 people by 2015.

The report cautions, however, that the projections beyond 2015 should be treated as illustrative, with a greater degree of uncertainty around the likely outcomes because of potential "employment impacts" on projects.

Rio Tinto, a member of the PICC, has already made moves to prepare for the long-term future of the Pilbara.

It has built about 215 homes across the Pilbara, but it is now focusing its efforts on its company-owned mining town of Pannawonica, home to about 1000 residents.

Operated by Rio Tinto, Pannawonica is set to be rejuvenated with a US$247 million makeover.

Rio Tinto plans to refurbish 238 homes in Pannawonica, build 10 homes, upgrade the airstrip, build a new service station and improve the meals centre, town buildings and landscaping.

The upgrade of the town is to support Rio Tinto's Mesa A iron ore mine that has an estimated life of 10 years and is currently under construction.

Rio Tinto Iron Ore Chief Executive Officer Sam Walsh said: "Pannawonica is a unique community in the Pilbara which is wholly supported by our mining operations."

Regional development is also a priority for the new State Government with the Royalties for Regions scheme, where 25 per cent of State resource royalties will be allocated to new projects in the State's regions.

Premier Colin Barnett has also identified, as part of the State Government's submission to the Commonwealth's A$20 billion Building Australia Fund, A$500 million of housing and infrastructure needs in the Pilbara.

Affordable housing, and power and water supplies are critical to underpinning development in the Pilbara region. ■

DRILLING

begins in heart of Canning Basin

The interior of the Canning Basin is vast and serviced by few sealed roads, making exploration for oil and gas difficult.

Petroleum production within Western Australia typically conjures up images of huge offshore oil and gas platforms and subsea pipelines running to massive processing facilities.

This impression could change if new exploration activity in the vast onshore Canning Basin can yield results.

Joint venture partners New Standard Energy (NSE) and Buru Energy have started the first drilling program in the heart of the basin in more than four years.

While considered prime for new oil and gas discoveries, the Canning Basin is sparsely populated, much of it inhospitable, difficult to traverse and serviced by few roads or other infrastructure, making exploration difficult.

Wells that have been drilled in recent years have been near those few roads, on the margins of the 530,000 km^2 basin, which is roughly the size of France.

NSE has held acreage in the Canning Basin for about 15 years and now has a portfolio of more than 90,000 km^2 of

New Standard Energy and Buru Energy have started the first exploration in the centre of the Canning Basin for four years.

THE CANNING BASIN

The extensive Canning Basin began developing about 480 million years ago. It is formed by deposits of sediment up to 12 km thick, between the much older rock formations of the Pilbara and Kimberley Cratons.

While Australia was still taking shape as part of the Gondwanaland supercontinent, parts of the basin were covered by vast seas, rich in plankton and nurturing massive fossil-rich coral reef formations, some of which are still features of the west Kimberley landscape.

The forces generated by earth movements, glaciers, further sedimentation and changing climates caused the remains of this ancient life to form the hydrocarbons that lure petroleum explorers to its rugged present day landscapes.

Since the 1920s nearly 250 petroleum exploration wells have been drilled and about 150,000 km of geophysical surveys conducted throughout the basin.

acreage, which it aims to systematically explore in conjunction with partners over the coming years.

In September 2007 it formed a joint venture with Buru, formerly a part of ARC Energy, following completion of ARC's own acquisition program across a large portion of the basin.

NSE Managing Director Sam Willis said the underexplored and highly prospective nature of the Canning Basin was the main attraction for the explorers.

"The opportunity to establish a dominant position in such a prospective area through ground floor acreage positions was attractive," Mr Willis said.

"In our view the costs of pursuing very large onshore exploration targets such as we have are also less, and more controllable, when compared to the costs of drilling similar opportunities offshore."

The joint venture has recently completed drilling its Lanagan 1 well, but decided to suspend the drilling of the second well in the 2008 program, Lawford 1, due to the wet season.

It currently intends to revisit Lawford 1 in 2009.

Under the terms of the joint venture, Buru is funding 35 per cent of drilling costs in return for a 35 per cent interest in NSE's EP417 exploration permit area.

The recent drilling activity was the first on NSE's Canning Basin acreage in more than 15 years.

Mr Willis said he rated the prospectivity of the Canning Basin highly. He said it was wildcat drilling but based on sound fundamental information.

"Over time and assuming systematic and thorough exploration is undertaken, NSE considers the Canning Basin has significant potential to contain large discoveries of oil and gas accumulations," he said.

Department of Industry and Resources Petroleum Director Bill Tinapple said the new drilling activity in the Canning Basin was a positive sign for the Western Australian oil and gas sector.

"The basin is considered substantially underexplored despite the significant possibility for exploration success in the region," he said.

"Western Australia is one of the few regions in the world where significant new petroleum discoveries continue to be made, so the possibility of a major new oil or gas development in the heart of the outback is a very real possibility."

DoIR makes regular releases of acreage for exploration in Western Australia's onshore and offshore sedimentary basins and provides extensive geological and background information to industry.

Acreage in the Canning Basin has been offered in the two most recent releases.

The first of these also included acreage in the Officer Basin and closed to bidding on 2 October this year, the other includes the Northern Carnarvon and Perth Basins and closes on 5 March 2009.

For further details please visit **www.doir.wa.gov.au/acreage_release** ■

NORTH WEST SHELF'S ANGEL PLATFORM

ON TIME & UNDER BUDGET

The A$1.6 billion Angel platform is the North West Shelf Venture's third offshore production facility.

Woodside, one of the six partners in the North West Shelf Venture, has started producing gas and oil from its new A$1.6 billion offshore remotely controlled Angel platform.

With a production capacity of 800 million standard cubic feet of raw gas and up to 50,000 barrels of condensate a day, hydrocarbons from the Angel platform will be processed through the North West Shelf Venture's (NWSV) integrated system, which now includes the Train 5 LNG production facility at the Karratha Gas Plant.

The Angel platform is part of the massive NWSV liquefied natural gas operation and is the venture's third offshore production facility.

Woodside Executive Vice President North West Shelf, Eve Howell, described the Angel Platform as a significant development that would feed into the NWSV's integrated production system.

"The safe completion of the project, on time and under budget, is a credit to the project teams involved and further demonstrates the North West Shelf Venture's commitment to ongoing investment in Australia's largest resource development," Ms Howell said.

Located 120 km northwest of Karratha, the platform stands in approximately 80 m of water and is supplied by three sub-sea production wells. The unique design of the platform enables it to be safely powered and remotely controlled by means of a subsea cable stretching 50 km from the North Rankin A Platform.

Planned maintenance is scheduled regularly and an accommodation area for up to 16 people was incorporated into the platform design.

Construction of the platform started in December 2005, with each of the six equal participants, BHP Billiton Petroleum, BP Developments Australia, Chevron Australia, Japan Australia LNG, Shell Developments and operator Woodside contributing approximately US$200 million in capital expenditure.

The China National Offshore Oil Corporation is also part of the NWSV, but does not have an interest in its infrastructure.

The NWSV is Australia's biggest resources project, costing A$25 billion, and providing more than 40 per cent of Australia's oil and gas production and approximately 60 per cent of Western Australia's domestic gas. ■

GOLDEN GECKO™
Awards for Environmental Excellence

The 2008 Award Recipients

The 2008 Golden Gecko Awards attracted one of the strongest fields of entries in the 17-year history of the event. The awards are organised by the Department of Industry and Resources and honour outstanding contributions to environmental sustainability in the Western Australian resources industry.

This year, at a gala ceremony at the Perth Convention and Exhibition Centre on September 10, Golden Geckos were awarded to Minara Resources, HIsmelt Operations and Kings Park and Botanic Gardens with Rocla Quarry Products. Rio Tinto Iron Ore also received a Certificate of Merit for its Lang Hancock Railway project.

GOLDEN GECKO™
Awards for Environmental Excellence
2008 AWARD RECIPIENT

Minara forges own path on rehabilitation

Murrin Murrin Environment Manager Tim Stevens (with Golden Gecko award) and the successful Minara team.

Rehabilitated vegetation at Minara Resources' Murrin Murrin nickel cobalt mine.

Unsuccessful attempts at mine rehabilitation based on existing guidelines prompted Minara Resources to take the bold initiative of creating its own key performance indicators to achieve consistent and sustainable outcomes.

The approach proved successful in more ways than one, with Minara improving the rehabilitation outcomes at its Murrin Murrin nickel cobalt mine, east of Leonora, and winning a 2008 Golden Gecko award for its efforts.

Minara began developing its Key Performance Indicators for Rehabilitation Success in 2004 (KPIs), in response to its uncertainty about rehabilitation outcomes.

The KPI process also sought to address the subjectivity which exists for reducing unconditional performance bonds, which are required by the Western Australian Department of Industry and Resources (DoIR) to ensure the State is not exposed to any unacceptable cost should mine operators fail to meet their rehabilitation requirements.

Minara engaged DoIR, the Department of Environment and Conservation and the local community in formulating the KPIs.

Murrin Murrin Environment Manager Tim Stevens said the framework stressed the critical importance of quality planning and landform construction to achieve consistent excellence in rehabilitation.

"The key environmental benefit provided by the KPI framework is a quality control mechanism throughout the entire rehabilitation process to ensure quality rehabilitation outcomes are achieved," he said.

"The framework ensures that the high expectations of community and regulatory stakeholders in regards to landform rehabilitation are met."

Minara identified and developed documentation for five key stages of successful mine rehabilitation - planning, construction, initial performance, monitored performance and sustainability.

Its success is reflected in the fact that DoIR has incorporated planning as a new stage into its own existing rehabilitation assessments.

As part of the KPI approach, Minara monitors the performance of landform construction against predicted design, to continually improve its future rehabilitation works.

The framework also ensures long-term continuity in the way in which rehabilitation success is monitored and assessed, regardless of any changes in staff.

DoIR Environment Director Ian Briggs said Minara's KPI system could potentially improve the regulatory process for environmental rehabilitation in Western Australia and improve the partnership between resources companies and the State Government.

"There is the potential for this KPI framework to be adopted statewide to improve mine closure planning," Mr Briggs said.

"It can allow companies to self-regulate to achieve rehabilitation standards, facilitate negotiations to agree on certain rehabilitation outcomes for the reduction of bonds, and remove the subjectivity from bond reduction assessments."

Mr Stevens said the Golden Gecko award provided recognition for more than four years of hard work.

"It was fantastic for the significant effort by the Minara team to be recognised," he said.

He said environmental awareness was increasing within the resources industry.

"There is a clear recognition within the resources industry that good environmental practice is now a critical part of the success of any business," Mr Stevens said.

"Community and government recognition and support for best practice environmental performance are very important. Minara considers these motivators valuable in driving industry to continually improve its environmental performance."

GOLDEN GECKO™
Awards for Environmental Excellence
2008 AWARD RECIPIENT

HIsmelt sets green benchmark for iron

John Dumbill (left) and the HIsmelt team with their Golden Gecko award.

The HIsmelt process produces a high quality molten pig iron with a small environmental footprint.

The developers of the HIsmelt iron-making process that won a Golden Gecko award this year have attributed its success to the "tremendous vision, patience and hard work of a great many people".

The HIsmelt process was developed by mining giant Rio Tinto and involves direct injection of fine iron ore and non-coking coals into a molten-iron bath contained within a smelt reduction vessel.

HIsmelt General Operations Manager John Dumbill said the end result was a high quality molten pig iron.

He said the process offered greater raw material and operational flexibility, lower operating and capital costs and, most importantly for the Golden Gecko judging panel, a lower environmental impact than conventional iron-making.

"From an environmental perspective, the HIsmelt process meets the highest environmental standards in iron making due to its high process efficiency and the elimination of coke and sinter-making production facilities," he said.

"The HIsmelt process offers lower than industry best practice emissions of carbon dioxide, nitrogen oxides and sulfur oxides, and the total elimination of the formation of dioxins, furans, tars and phenols.

"In addition, the Kwinana facility has been designed to minimise its energy consumption, improve water efficiencies through the utilisation of recycled water, and investigate uses for by-products."

The Water Corporation has worked with HIsmelt on the development of the Kwinana Water Reclamation plant and rates HIsmelt the best water manager of large users in Western Australia.

The concept of processing iron ore without the need for coke was first conceived in the early 1980s in Germany.

The development of the technology in Australia has been explored through several small scale pilot plants, including the HIsmelt research and development facility at Kwinana, which opened in 1993.

Construction of a commercial scale plant at Kwinana began in 2003 and was completed in 2005, when a three-year ramp up schedule began.

HIsmelt Operations aims to reach its 800,000 tonne capacity by the end of this year.

Mr Dumbill said the Golden Gecko was an iconic award and winning it provided a unique opportunity to showcase the work being done at HIsmelt.

"Bringing the HIsmelt technology on-stream has taken tremendous vision, persistence and hard work by a great many people - this award goes to those people," he said.

Mr Dumbill said environmental awareness was increasing in the resources industry.

"For many years safety has been the number one priority in industry, but this is no longer enough, industry must operate safely with minimal impact on our environment," he said.

"Our challenge is to hold our environmental performance on a par with our safety performance, on equal footing if you like. With that imperative, environmental awareness has increased exponentially.

"The support from community and government is critical in not only raising the profile of the industry as it strives for environmental excellence, but in also recognising those efforts so that the bar is continually raised and the knowledge is shared, such that we all benefit."

HIsmelt has committed to a new commercial project called HIsmelt Mark II.

A pilot plant phase is near completion and the project is expected to be in commercial operation by 2015. The major benefit of this project will be a further 50 per cent reduction of carbon dioxide emissions from the iron-making process.

GOLDEN GECKO™
Awards for Environmental Excellence
2008 AWARD RECIPIENT

Partnership sees Banksia woodland prosper

The Golden Gecko awarded to Rocla Quarry Products and Kings Park and Botanic Gardens this year was the culmination of a 13-year partnership for the rehabilitation of Banksia woodland at Rocla's sand quarries in the Perth metropolitan area.

The partners received the coveted Golden Gecko Award for fostering environmental excellence in Western Australia's resources industry.

The partnership began when Rocla approached Kings Park in 1995 in an attempt to improve rehabilitation standards at its Lexia and Banjup sites, and introduce a greater number of the 150-200 species that typically occur in Banksia woodland.

It has since led to the creation of what the two parties consider optimum techniques for seedling establishment and plant survival.

"These include the use of smoke and seed coatings as aids to germination and the development of best practice for topsoil management," said Rocla Resource and Development Manager Vern Newton.

The two partners' efforts have increased species recovery from 1 per cent to more than 70 per cent for rehabilitated sites, while plant density has increased to more than 100 plants per 5m².

"These are among the best results ever achieved within a biodiverse woodland community in Western Australia," Mr Newton said.

Rocla and Kings Park entered the Golden Gecko Awards to receive some recognition for their years of collaboration.

"It's particularly positive for recognition to be given to the on-site operators and supervisors who have completed the day-to-day restoration work," Mr Newton said.

The improved scientific understanding of Banksia woodland gained as a result of Rocla and Kings Park's collaboration is expected to be applied across Western Australia's Swan Coastal Plain.

The partners have disseminated their results through avenues such as community workshops, lectures and conferences.

"We're committed to increasing the research knowledge database for the sand extraction industry, and the restoration industry in general," Kings Park and Botanic Gardens restoration ecologist Deanna Rokich said.

Kings Park has recently isolated the compound in smoke that triggers seed germination and is looking at ways of synthesising it to allow direct application to seeds.

Ms Rokich said smoke was a proven germination tool for Australian vegetation.

"The responsiveness can be explained from an ecological point of view, whereby regeneration of native plants is enhanced following a fire event, so it is not surprising that smoke is the main trigger for seed germination," she said.

The use of seed coatings in Kings Park and Rocla's work followed the loss of a large quantity of seeds through wind and invertebrate activity.

"We have resolved that seed coatings increase seedling emergence in rehabilitation sites, most likely as a result of the coated seeds having a greater weight that decreases removal, or as a result of a change in seed colour that decreases seed recognition by inverterbrates," Ms Rokich said.

Topsoil conservation has been dramatically improved within Rocla's quarries through replacement of the topsoil seedbank with fresh and dry topsoil at half of the depth at which it has been stripped.

Ms Rokich and Mr Newton both believe environmental awareness in the resources industry is increasing.

"I think that most companies are more committed to the environment and are beginning to see the benefits of being a good corporate citizen, along with being accepted by communities and being an employer of choice because of the positive environmental decisions we make," Mr Newton said. ■

Rocla Resources and Development Manager Vern Newton (left) and Operations Manager Patrick Cashmore with their Golden Gecko award.

Banksia woodland is an iconic part of the Western Australian bush.

BRIGHT WHITE

future for high quality kaolin

The brilliant white stockpiles of WA Kaolin's mine on Uleling Hill present a dazzling contrast against the gently undulating countryside around Wickepin, 200 km south east of Perth.

The abundance of the resource is confirmed by WA Kaolin Managing Director Phil Larson.

"We estimate we have 100 million tonnes of high quality kaolin below the 1000 ha property we own and in the surrounding 10 square kilometres over which we have mining leases," he says.

"This is enough for 100 years at our eventual target production of 1 million tonnes per annum (mtpa)."

Mr Larson said the company's kaolin ore resource was about 50 per cent kaolin and 50 per cent quartz sand.

He said this was comparable with the best such ores internationally.

"In Cornwall I worked with ore that contained only 12 per cent kaolin and the UK has been producing 3 mtpa of high grade kaolin for decades," he said.

WA Kaolin has recently completed a A$20 million mine development and pilot plant construction project and is preparing to start continuous production at a rate of 20,000 tonnes per annum early next year.

The new plant is located on a 3 hectare site at Kwinana, Western Australia's major heavy industrial area, just south of Perth.

This is more than adequate to accommodate planned future expansion – first to 150,000 tpa, for which the company is currently raising capital, and then eventually to 1 mtpa.

It is within 1200 m of Fremantle Ports' bulk freight jetties and close to freight rail lines, with efficient road and rail access to container terminals.

At the new plant, the ore is wet screened to remove quartz sand, then a centrifuge separates paper coating quality particles, which are dried in a gas-heated spray dryer.

The products are then pelletised and packaged in 1 tonne bags, for stacking in a container.

Mr Larson said when volumes increased significantly, the screening operations would move to the mine site, with the sand being returned to fill open cut pits.

He said the company also planned to transfer the 230 km transport task from road to the existing rail network.

The processed kaolin is initially being shipped to customers in containers, but the plant is ideally located to enable bulk shipping.

"Pelletising the particles, rather than leaving them as a fine dust, makes the kaolin much easier to transport and handle – a clear environmental benefit," he said.

"Our process also incorporates particle engineering to create kaolin plates with a high aspect and low viscosity – best for use in paper coating.

"Individual particles are subject to massive pressures during paper manufacturing, as the kaolin is spread by a blade over paper at 600-1300 metres per minute.

"We are producing a very pure, high quality, uniform kaolin particle suited to producing bright white, highly opaque coating on paper.

"When you are reading your book, or newspaper you don't want to see what's on the next page."

Mr Larson said the world's paper production focus was shifting to Korea, China, Japan and increasingly India, from traditional centres in Scandinavia and the United States.

WA Kaolin's plant at Kwinana is being expanded to a capacity of 150,000 tonnes per annum, and eventually to one million tonnes per annum.

"The Asian producers have been achieving double digit growth," he said.

"In these markets, WA Kaolin has significant advantages over major competitors in Brazil and the US, with our product needing to travel only half the distance.

"We are also able to take advantage of lower container freight rates on vessels returning to key Asian ports having delivered consumer and industrial goods.

"We have made initial sales to a major Korean paper producer and it is very interested in taking more.

"We are also exploring opportunities to sell kaolin to Japanese ceramics producers who require a pure product – the presence of iron for example can create an unwelcome yellow tinge.

"The challenge for us will be producing enough Kaolin to meet the enormous demand out there."

The Uleling Hill deposit near Wickepin provides an abundant kaolin resource.

The story of kaolin

Kaolin, a white, soft plastic clay composed of alumina (about 39.5 per cent) Silica (46.5 per cent) and water (14 per cent) is abundant in the South West of Western Australia.

In Western Australia, primary kaolin deposits have been formed by the weathering of feldspar mineral components of ancient granites located in the Yilgarn Craton, which makes up about one-third of the State's land surface.

Most Western Australian kaolin deposits are of the primary or residual type located where they are formed, rather than secondary kaolin transported by water and deposited at the bottom of lakes and rivers.

The highest grade kaolin, or paper grade, is used in the production of bright white, opaque coating for paper.

High grade kaolin has a wide range of other uses including for ceramics, porcelain and glass, as a refractory for high temperature uses, as a filler in plastics, paint and rubber, and in pharmaceuticals, medicines and cosmetics.

World production of commercial high grade kaolin in 2006 was estimated at 24 million tonnes per annum, of which 12 mtpa were used in paper manufacture.

The commercial quality of kaolin is measured in terms of its particle size, brightness or whiteness, opacity, viscosity and moisture content.

Paper manufacture requires fine kaolin, 80 per cent of which has a particle size less than 2 microns; it must be highly opague, with brightness greater than 80 per cent; it needs to have low viscosity, so that it runs easily when applied and under pressure; and have a moisture content of less than 2 per cent.

While numerous deposits of commercial grade kaolin have been identified, currently Western Australia is not an exporter or significant producer.

The world's major producers are Brazil, the US and the UK, with Queensland currently accounting for the bulk of Australian high grade kaolin production. ■

High grade kaolin is used in the production of bright, white, opaque coating for paper.

KALGOORLIE

mining sector to gain from new complex

A new facility in the key Western Australian regional centre of Kalgoorlie aims to improve Government services to the mining sector operating in the Goldfields region.

The Kalgoorlie Complex opened to business on 20 October with 30 Government staff from the previous Department of Industry and Resources (DoIR) and Department of Consumer and Employment Protection (DoCEP) offices in the City.

The new complex is scheduled to be officially opened at a ceremony early next year.

Western Australian Mines and Petroleum Minister Norman Moore said the new facility would support the Government's commitment to regional development in Western Australia.

"The Kalgoorlie Complex will provide a more efficient delivery of Government services in one of the most important centres for the WA resources industry," he said.

"Mining companies will have access to everything from geological and mineral titles information to workplace safety and environmental advice, in a single convenient location."

Kalgoorlie-Boulder has a population of more than 30,000 and is a service centre to the Goldfields region – the historical heart of Western Australia's mining sector and still a major resources province, particularly for gold and nickel.

Projects such as the massive Super Pit gold mine saw the Goldfields and adjacent Esperance region generate A$9.3 billion worth of resources production in 2007.

The new Kalgoorlie Complex is located on the corner of Hunter and Broadwood Streets in the west of the town, adjacent to the drill core library for the Geological Survey of Western Australia.

Seventeen DoIR and 18 DoCEP staff moved from previous premises at Brookman Street and Viskovich House.

DoIR Facilities Services General Manager Joe Kaciuba said the relocation allowed Goldfields mining sector members access to all the Government services they required, at one location.

"In moving to this new complex, the Government agencies in Kalgoorlie have responded to the demands of industry," Mr Kaciuba said.

"DoIR and DoCEP conducted surveys over the past few years on the adequacy of their services in the region and respondents were clear on the need for a 'one-stop shop' for mining in Kalgoorlie.

"We have also responded to other requests for the facility, such as the provision of more privacy for users of the Tengraph titles information system."

The Kalgoorlie Complex will provide access to the latest technology to assist with exploration and mining activities.

Its also features improved reception facilities, and more confidential meeting rooms and parking compared with the previous Kalgoorlie DoIR and DoCEP facilities.

Services available to the mining sector from the new facility include the regional mining registrar, mineral and title services, environmental assessments and regulatory services, and resources-specific safety services.

Staff at the complex will also provide workplace safety, consumer protection and labour relations services to the community.

Both DoIR and DoCEP are being restructured by the State Government, with the three new departments of Mines and Petroleum, State Development, and Commerce to be created. ■

The Kalgoorlie Complex, which opened on 20 October, offers a new level of State Government service to the Goldfields region.

LOCAL potential in Indonesia's mining expansion

Western Australia's expertise in supplying and servicing the resources industry has become highly sought after in Indonesia.

Indonesia is resource rich and expanding quickly, and impending changes to its mining laws will pave the way for more growth.

Internationally, the country ranks second in tin production, third in copper and fourth in nickel, and is now ranked second to Australia in coal exports.

Following this rapid growth in production, Indonesia needs mining equipment, consumables, technology and services, which provides an opportunity for Western Australian suppliers to take advantage.

To help bridge the international gap, Austrade's Jakarta office developed the very successful OZMINE Indonesia, a two-day trade show and mining conference designed to connect the Australian mining services sector with agents, distributors and senior executives from the Indonesian mining industry.

Marking its third anniversary, OZMINE 2009, to be held February 24-25 in Jakarta, is open to any Australian business servicing the mining industry and interested in expanding operations in the Association of South East Asian Nations region.

Department of Industry and Resources Indonesian Regional Director Martin Newbery said Indonesian mine operators highly regarded Western Australian technology.

"Mine operators in Indonesia are particularly on the lookout for equipment and services that can assist them to meet their corporate social responsibility and environmental management responsibilities," Mr Newbery said.

"WA has a highly regarded reputation and our enviable track record in innovative and cost effective solutions to reduce operating costs is very attractive in the eyes of Indonesian mine operators.

"Some WA companies already supply Indonesia but current growth and the possibility of new mining laws opens the doors for bigger and better opportunities. Our close proximity also provides a real competitive edge over others, particularly in terms of how fast we can deliver equipment."

The Indonesian parliament is currently debating new mining laws that will change the future outlook for foreign investment. In the past 10 years, there has been very little foreign mining investment in Indonesia, especially in hard rock mining, and no new contracts have been issued since 1998.

Mr Newbery said all new projects currently undertaken by foreign mining companies were issued prior to1998.

"If new laws are passed and successfully provide regulatory clarity and security of tenure from exploration to exploitation, more opportunities for foreign investment in services, from drilling to operating mines, are anticipated to emerge," he said.

Western Australian company Inflatable Packers International Pty Ltd (IPI), travelled to Indonesia for this year's OZMINE. The company designs and manufactures high specification inflatable packers and associated equipment for the resources, geotechnical, scientific, engineering, construction and drilling industries.

IPI's Howard Kenworthy said marketing in Jakarta had proven to be very

OZMINE puts Australian businesses in direct contact with Indian mining decision-makers.

There were 53 Australian companies exhibiting at Indonesia's OZMINE event in 2008.

INDONESIA NEEDS AUSTRALIAN MINING EQUIPMENT, CONSUMABLES, TECHNOLOGY AND SERVICES SUCH AS:

- pumps
- crushers and associated mineral processing equipment
- production equipment including drag lines, drilling equipment, excavator buckets and other ground engaging tools
- drilling services
- software
- materials handling systems
- a wide range of spare parts
- consumables including chemicals, wear plates and explosives
- coal washeries
- contract mining (mainly for coal) and other mining services

successful for sales in equipment for coal bed methane (CBM).

"CBM is a form of natural gas that is extracted from coal beds. The CBM industry crosses both mining and conventional oil and gas, and Indonesia's huge coal mines have started to mine it," Mr Kenworthy said.

"IPI also sees Indonesia as having excellent potential across several 'down hole' markets and our efforts to develop these markets have been greatly assisted by the Austrade team in Indonesia, and OZMINE.

"Jakarta is a major forum to gain access to other markets in South-East Asia, and in turn we have also made sales in Vietnam. IPI is also expecting more conventional mining orders soon."

Austrade Jakarta Trade Commissioner for Mining Craig Senger said this year's OZMINE Indonesia was very successful.

"This year, including IPI, 53 Australian companies exhibited at OZMINE. By making connections face-to-face and being able to display and show first-hand their wares, many OZMINE exhibitors have gone on to sign on local partners and make sales," Mr Senger said.

"OZMINE puts business in direct contact with Indonesian mining company decision makers, the senior Indonesian executives who attend this event.

"By participating, businesses will create awareness of their products and services in Indonesia's vital market, develop relationships as well as receive on-the-ground assistance from Austrade and advice on how to operate successfully in Indonesia."

Mr Newbery said OZMINE offered Western Australian businesses the opportunity to expand into a relatively untapped market.

"In times of economic uncertainty, diversifying your business base can be a saviour. Participation in OZMINE Indonesia could potentially open the doors your business needs to grow and stay afloat."

For more information on OZMINE Indonesia and how to participate, please visit the Austrade website: **www.austrade.gov.au/miningmissions2009**

Austrade Manila also holds the Explore Philippines Mining Mission. This is a three-day event that includes a technical seminar and mine site visits. ■

Commissioned Projects

COAL

Collie - Collie Coal Mine (Ewington II)
THE GRIFFIN COAL MINING COMPANY PTY LIMITED
Griffin Coal is developing its Ewington II coal deposit, approximately 7km east of Collie, which has estimated coal resources of 115 Mt. The mine will produce about 2.5 Mt/a of coal for private sector customers, including Griffin Energy's Bluewaters 1 and 2 power stations. Ewington II coal will also supply up to 800,000 tonnes per year of coal to the Griffin Group's new char plant, which is currently under construction.

Expenditure: $50m.

Employment: Operation: 50

OIL & GAS DEVELOPMENTS

Carnarvon Offshore Basin - Angel Gas and Condensate Field
WOODSIDE ENERGY
The Angel gas and condensate field, operated by Woodside as part of the North West Shelf Venture (NWSV), includes the NWSV's third fixed production platform. A 50km subsea pipeline links the new platform to the existing North Rankin production facility. First gas was produced in October 2008. The platform will be capable of processing 800 million standard cubic feet of gas a day and 50,000 bbl/d of condensate.

Expenditure: $1.6b.

Carnarvon Offshore Basin - Vincent Oil Field
WOODSIDE ENERGY
The field is located approximately 50 km northwest of Exmouth in a water depth of about 350 metres. Oil will be produced through an eight well subsea development and processed and stored in a Floating Production Storage and Offloading vessel. Production commenced in August 2008.

Expenditure: $1b.

North West Shelf - Project Expansion 5th LNG Train
WOODSIDE ENERGY
The NWSV's fifth processing train is now fully operational and producing LNG. This train will contribute up to 4.4 Mt/a of LNG. The facility brings total investment in the NWSV development to over $25 billion.

Expenditure: $2.6b.

Employment: Construction: 1800; Operation: 20

BAUXITE

Worsley/Boddington - Alumina Refinery Expansion
WORSLEY ALUMINA PTY LTD
BHP Billiton announced in May the go-ahead for the $2.5 billion Efficiency and Growth expansion project at its Worsley alumina refinery. The expansion project will lift capacity of the refinery from 3.5 Mt/a to 4.7 Mt/a through expanded mining operations, additional refining capacity and upgraded port facilities. The construction phase will start immediately and first production is expected in the first half of 2011.

Expenditure: $2.5b.

Employment: Construction: 1500; Operation: 200

CHAR

Collie - Collie Coal Mine (Ewington II) Char Plant
THE GRIFFIN COAL MINING COMPANY PTY LIMITED
The char plant is designed to drive off most of the water and volatile compounds from Ewington II coal. The plant, located about 4.5 km east of Collie, will convert up to 800,000 t/a of coal, from the Ewington II mine, to 400,000 t/a of char from two process units. The plant will produce high value char suitable for steelmaking as well as generation of 24 MW of power.

Collie - Premier Mine Char Plant
WESFARMERS PREMIER COAL LIMITED
At its Premier coal mine near Collie, Wesfarmers Energy has commissioned a demonstration scale char plant, with a target production capacity at full operation of 50,000 t/a. The plant is providing sufficient volume to allow potential customers to fully assess the product. Char has applications in steelmaking, ferro alloy production, mineral sands processing, smelting and some chemical plant processes.

Expenditure: $8m.

Employment: Operation: 10

Committed Projects

COAL

Collie - Collie Coal Mine (Ewington I)
THE GRIFFIN COAL MINING COMPANY PTY LIMITED
Griffin Coal plans to develop its Ewington I coal deposit, approximately 2 km east of Collie, which has estimated coal resources of 408 Mt. The mine will produce approximately 3.4 Mt/a of coal for private sector customers, including Griffin Energy's nearby Bluewaters 1 power station, presently under construction, and its proposed Bluewaters 2 power station. Mine start-up is scheduled for 2008-09. The Ewington I coal mine will be an extension of the Ewington II mine.

Expenditure: $20m.

DIAMONDS

Kimberley - Argyle Diamond Mine
ARGYLE DIAMOND MINES PTY LIMITED
Development of the Argyle Diamond Mine commenced in 1982 and mining commenced in the main ore body (AK1) in 1985. The mine is operational and in order to extend the life of the mine to around 2024 the company has committed to an underground mine expansion.

Expenditure: $1.2b.

Employment: Construction: 250; Operation: 500

ELECTRICITY

Karratha - 7 Mile Power Station
HAMERSLEY IRON PTY LIMITED
Rio Tinto has proposed a power infrastructure replacement program and upgrade for its mining and port operations in the Pilbara region. Hamersley Iron Pty Ltd is constructing a new power generating facility at 7 Mile near Karratha. Robe River Mining Company Pty Ltd is constructing a 220 kV transmission line and a sub-station at Cape Lambert. The sub-station will be linked to the 7 Mile main power generator via the new transmission line. Hamersley and Robe will share the generation capacity created by the new power station. This new single station will replace the two aging plants at Dampier and Cape Lambert.

Expenditure: $500m.

Collie - Bluewaters I and II Coal-fired Power Stations
GRIFFIN ENERGY PTY LTD
Griffin Energy is constructing the first of two 208 MW coal-fired power stations at the proposed Coolangatta industrial estate, 10 km northeast of Collie. Commissioning of the Bluewaters 1 coal-fired base load power station is expected by late 2008. Griffin expects the second of the two power stations (Bluewaters II) to be commissioned in late 2009.

Expenditure: $400m.

Employment: Construction: 600; Operation: 50

GOLD

Boddington - Gold Mine (Wandoo Expansion)
BGM MANAGEMENT COMPANY PTY LTD
BGM Management Company Pty Ltd, on behalf of Newmont and AngloGold Ashanti, is developing the Wandoo project, based on mining the extensive bedrock resource that underlies the mined-out oxide resource. The mine has been in the construction phase since 2006. Production will be around 800,000 oz/a of gold and about 30,000 t/a copper in concentrates over a 17-year mine life. Initial production is expected by late 2008 or early 2009. The Wandoo project will result in significant growth in and around the rural community of Boddington, 120 km southeast of Perth.

Expenditure: $2b.

Employment: Construction: 1500; Operation: 650

HEAVY MINERAL SANDS

Narngulu - Processing Facility Expansion
ILUKA RESOURCES LIMITED
Iluka recently announced a proposed $60 million upgrade of its Narngulu processing facility to treat ore from South Australia to supplement a diminishing supply from its Eneabba mining operations. Iluka will treat up to 600,000 t/a of heavy mineral concentrate from its Jacinth-Ambrosia deposit in SA at Narngulu, starting in early 2010. Subject to obtaining all government approvals, up to 350,000 t/a of zircon will be produced at the plant.

Expenditure: $60m.

IRON ORE

Cape Lambert - Port Expansion
ROBE RIVER MINING CO PTY LTD
Robe River Mining is expanding the capacity of its port facilities at Cape Lambert, east of Karratha. The expansion will lift the iron ore export capacity of the facilities to 85 Mt/a. It is anticipated that the expansion will be completed Q4 2008.

Expenditure: $1.1b.

Employment: Construction: 450; Operation: 70

Central Pilbara - Brockman Syncline 4 - Iron Ore Mine
HAMERSLEY IRON PTY LIMITED
Hamersley Iron is developing the Brockman Syncline 4 iron ore deposit. Construction work has commenced and commissioning is expected in 2010. Full capacity of 22 Mt/a is expected to be reached in 2012.

Expenditure: $1.5b.

Employment: Operation: 1500

Dampier - Dampier Port Expansion
HAMERSLEY IRON PTY LIMITED
Hamersley Iron is well advanced in its construction work to expand the capacity of its port facilities at Dampier Port from 120 Mt/a to 145 Mt/a. This increase will be through the Parker Point terminal and be achieved through greater utilisation of existing equipment and an increase in rail transport and shipping movements.

Expenditure: $920m.

Employment: Construction: 800; Operation: 200

Mid West Region - Extension Hill Hematite Mine
MT GIBSON IRON LTD
Mount Gibson Iron has environmental approval for a 2 Mt/a hematite mining operation at Extension Hill, 330 km southeast of Geraldton. The ore will be trucked to a rail head near Perenjori then railed to the port of Geraldton for export. The Mount Gibson board has approved commencement of construction of the project. Subject to secondary government approvals, Mount Gibson expects to have initial shipments in Q2 2009.

Expenditure: $73m.

Employment: Construction: 150; Operation: 100

Mid West Region - Koolanooka/Blue Hills Hematite Iron Ore Mine
MIDWEST CORPORATION LIMITED
Midwest Corporation commenced transporting iron ore fines from stockpiles at Koolanooka, about 160 km southeast of Geraldton, in January 2006, with the first exports shipped in February 2006. Midwest proposes to reopen the Koolanooka and Blue Hills hematite iron ore mines at a rate of 1-2 Mt/a, with timing dependent on the timing of government approvals. The re-opening of the mines is being environmentally assessed at a Public Environmental Review level.

Expenditure: $26m.

Employment: Construction: 40; Operation: 60

Pilbara - Atlas Iron Pardoo Hematite Direct Shipping Ore (DSO) Mine
ATLAS IRON LTD
Atlas Iron Ltd is an active explorer and developer focused on iron ore projects. The company is due to start exporting in December 2008. With a growing number of iron ore projects and a large landholdings in the Pilbara (9,600km^2) located close to existing infrastructure, the company is effectively defining resources and reserves, capable of being mined with relatively low capital expenditure. Atlas became the Pilbara's 4th iron ore producer during 2008, with initial production from its Pardoo Project, located some 75km east of Port Hedland. The company has exploration programs underway across its tenement portfolio, with an exploration target of 160 to 220 million tonnes grading 57-60 per cent Fe. This will underpin an expanded long-term production business.

Pilbara - Rapid Growth Project 4
BHP BILLITON IRON ORE PTY LTD
BHP Billiton Iron Ore has all necessary government approvals and is currently expanding the production capacity of its Western Australian iron ore operations from 129 Mt/a to 155 Mt/a (RGP 4) to operate from 2010. The increased production involves mine expansions, developing an ore processing hub at Newman and port works at Port Hedland.

This section is intended as an overview and does not constitute an exhaustive list of projects within the Western Australian resources industry.

Pilbara - Rapid Growth Project 5
BHP BILLITON IRON ORE PTY LTD
BHPBIO is currently in the process of seeking approvals for its next phase of expansions, which will increase the company's total Pilbara iron ore production to 205 Mt/a (RGP 5) for 2012 (to be undertaken in parallel with the 155 Mt/a RGP 4 expansion already underway). The increased production involves mine expansions, railway duplication and additional berths at Port Hedland. BHPBIO is also investigating further expansion to 300 Mt/a by 2015.

IRON ORE PROCESSING

Kwinana - HIsmelt Commercial Iron Making Plant
HISMELT CORPORATION PTY LTD
HIsmelt Corporation, in a joint venture with Nucor (25 per cent), Mitsubishi (10 per cent) and Shougang (5 per cent), has developed a commercial-scale HIsmelt process plant at Kwinana, near Perth. The first stage of the plant is designed to produce 800,000 t/a of pig iron from iron ore fines, coal and fluxes. First hot metal production commenced in mid-2005, with commissioning continuing towards full production capacity over 3 years.

Expenditure: $800m.

Employment: Construction: 320; Operation: 65

OIL & GAS DEVELOPMENTS

Carnarvon Offshore Basin - Pluto LNG Project
WOODSIDE ENERGY
Woodside approved the Pluto LNG project in Q3 2007. Construction has commenced on Sites A and B on the Burrup Industrial Estate for export of LNG in Q4 2010.

Expenditure: $11.2b.

Employment: Construction: 3000; Operation: 200

Carnarvon Offshore Basin - Pyrenees Development Oil Fields
BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED
In July 2007, BHPB Petroleum announced approval of the Pyrenees oil development, located 45 km north of Exmouth. The development comprises the Crosby, Ravensworth and Stickle oil fields which have estimated recoverable oil reserves in the range of 80-120 million barrels. The project involves the development of 13 subsea wells connected via flowlines to a Floating Production Storage and Offloading vessel, which will be capable of producing about 96,000 bbl/d of oil. First production is expected during the first half of 2010 and the estimated economic field life is 25 years.

Expenditure: $2b.

Carnarvon Offshore Basin - Van Gogh Oil Field
APACHE ENERGY LIMITED
The Van Gogh oil development, located around 50 km northwest of Exmouth, will utilise a Floating Production Storage and Offloading vessel with a processing capacity of 63,000 bbl/d of oil and storage capacity of 620,000 barrels. It will be linked to two subsea drill centres with 10 production wells. Subject to obtaining all the necessary government approvals, the field installation of Van Gogh is expected to start in late 2008 and be in production by early to mid-2009. The expected life of the development is 12-15 years.

Expenditure: $600m.

RARE EARTHS

Mt Weld - Rare Earths Mine
LYNAS CORPORATION LTD
The Mt Weld deposit, located about 35 km south of Laverton, contains an estimated resource of 12.2 Mt at 9.7 per cent grade for 1.18 Mt rare earth oxides (REO). The development involves an open pit mine and concentration plant at Mt Weld. The concentrate will be containerised on site then trucked to Leonora and railed to a container port for export. The first mining campaign was completed in May 2008 and construction of the concentration plant is underway. The ore will be shipped to a $220 million processing plant in Malaysia, which will have an initial production capacity of 10,500 t/a REO in late 2009 and is then expected to be expanded to 21,000 t/a in 2011.

Expenditure: $90m.

Employment: Construction: 12; Operation: 40

TITANIUM DIOXIDE PIGMENT

Kwinana - Titanium Dioxide Pigment Plant Expansion
TIWEST JOINT VENTURE
Tiwest, through its joint venture partners Tronox Incorporated and Exxaro Resources, has approved an expansion at its Titanium Dioxide Pigment Plant in Kwinana that will see a 36 per cent ramp-up in production from the plant's current capacity of 110,000 t/a to around 150,000 t/a, in a bid to take advantage of the strong demand in the Asia-Pacific region. Construction is expected to start in December 2008, subject to government approvals, with additional capacity to come online in early 2010.

Expenditure: $100m.

Employment: Construction: 108; Operation: 12

VANADIUM

Windimurra - Vanadium Pentoxide Mine and Processing Plant
WINDIMURRA VANADIUM LIMITED
Windimurra Vanadium is progressing development of the Windimurra Vanadium mine. Construction of the mine infrastructure and processing plant is well advanced, with commissioning and first production scheduled for Q1, 2009. Mining operations commenced in October following the recent approval of stage 1 of its Mining Proposal. Once operational, Windimurra Vanadium will produce ferro-vanadium (an alloy of vanadium and iron). At full production the project will produce 8 per cent of the world's vanadium.

Expenditure: $296m.

Employment: Construction: 400; Operation: 120

AMMONIA/UREA

Burrup Peninsula - Ammonia Plant
DYNO NOBEL ASIA PACIFIC LIMITED
Dyno Nobel purchased the interests of Plenty River (Plentex) and Thiess in a large scale ammonia/urea project to be located on the Burrup Peninsula. The company is also conducting a feasibility study into developing a 230,000 t/a ammonium nitrate production facility, which could be located on the Burrup Peninsula. The alternative (to a large scale ammonia plant) of building a small scale ammonia plant to supply the ammonium nitrate plant is being investigated as part of the feasibility study.

Expenditure: $900m.

Employment: Construction: 1000; Operation: 130

BAUXITE

Wagerup/Willowdale - Alumina Refinery Train 3 Expansion
ALCOA WORLD ALUMINA AUSTRALIA
Alcoa is investigating the feasibility of a third production train expansion at its Wagerup alumina refinery to increase capacity to 4.7 Mt/a. On 14 September 2006, the Minister for the Environment approved the expansion proposal. A decision on the project go-ahead is dependent on market factors.

Expenditure: $1.5b.

Employment: Construction: 1500; Operation: 260

COAL

Collie - Bluewaters III and IV Coal-fired Power Stations
THE GRIFFIN COAL MINING COMPANY PTY LIMITED
Griffin Energy Pty Limited is planning to expand the Bluewaters Power Station Project with two additional 208 MW coal-fired power stations to be located on the Coolongatta Industrial Estate, 4.5 km north-east of Collie. Commissioning of the Bluewaters III base-load power station in expected by late 2012 and commissioning of Bluewaters IV by late 2014. Final investment decision is due in Q3 2009 for Bluewaters III and Q3 2010 for Bluewaters IV. Construction phases are scheduled to commence at those times.

Expenditure: $800m.

Employment: Construction: 600; Operation: 30

COPPER

Pilbara - Panorama Copper/Zinc Mine
CBH RESOURCES LTD
The Panorama Project is located about 110 km southeast of Port Hedland. It involves the construction and operation of an open pit mine and associated infrastructure, with a mine life of approximately 8 years. Approximately 75,000 t/a of copper concentrate and 85,000 t/a of zinc concentrate are planned to be produced for shipment via Port Hedland. The project is undergoing environmental assessment through a Public Environmental Review.

Expenditure: $250m.

Employment: Construction: 176; Operation: 150

ELECTRICITY

Dongara - Centauri 1 Power Project
ENEABBA GAS LIMITED
Eneabba Gas Limited (EGL) has received all necessary approvals for the start-up of its 168 MW Centauri 1 gas-fired power station project, located on company-owned land eight kilometres east of Dongara. Planning approvals have been received from the Shire of Irwin, Environmental Protection Authority and Department of Industry and Resources (DoIR). EGL is the only holder of an Economic Regulation Authority (ERA) generation licence in the Mid West. A Memorandum of Understanding (MoU) has been signed with Verve Energy to swap gas for operational flexibility. The project will be capable of supplying power into the South West Interconnected System but will be focused on supplying additional volumes of energy for the developing Mid West iron ore industries. EGL has an agreement to acquire four GE LM 6000 gas-fired turbines which will allow construction to commence on site immediately and for the plant to be operational in approximately 14 months; as soon as take or pay contracts for Mid West iron ore customers are confirmed. Generation capacity can be easily increased to 365 MW. Besides sourcing gas from the Dampier to Bunbury Natural Gas Pipeline, EGL has ten 100 per cent-owned exploration tenements containing coal deposits. A preliminary drilling program has returned positive results for a low-cost alternative energy source which would minimise Greenhouse effects. EGL is awaiting DoIR approval for an expanded drilling program to prove up the capacity for coal gasification of the resource.

Expenditure: $200m.

Employment: Construction: 100; Operation: 4

Mid West Region - Central West Coal & Coolimba Power Projects
AVIVA CORPORATION LTD
Aviva Corporation Ltd is progressing the development of the Coolimba Power Project, a 2 x 200 MW base-load coal-fired power station and an associated coal mine located 20 km south of Eneabba. Coolimba will be the first power station in WA to deploy leading edge emissions technology for carbon capture. Upon commissioning, the power station will constitute 8 per cent of the installed capacity in the South West Interconnected System and have an operating life of 30 years. Subject to government approvals, construction is expected to commence in mid 2009 and will extend over three years for completion in 2011-12.

Expenditure: $1b.

Employment: Construction: 600; Operation: 100

Neerabup - Bioenergy
SPIRITWEST BIOENERGY PTY LTD
SpiritWest is developing a 30 MW base load power station at Neerabup, 33 km north of Perth. The power station will use timber waste from pine plantations nearby, and other wood residues. Environmental approval was received in 2006, and a final investment decision is expected by the end of 2008, with construction commencing shortly thereafter. Commercial operation is scheduled for 2010-11.

Expenditure: $100m.

Employment: Construction: 250; Operation: 45

GOLD

Goldfields - Tropicana Gold Project
ANGLOGOLD ASHANTI/INDEPENDENCE GROUP JOINT VENTURE
AngloGold Ashanti, as joint venture manager, has undertaken an intensive exploration and resource development program approximately 400 km north-east of Kalgoorlie. Plans for the project are to develop an open-cut gold mine and nearby processing plant. So far, a resource estimate of 4 million oz of gold has been identified, with a mine life of 10 years. Mining is planned to commence in 2010 with production of over 300,000 oz per annum.

Expenditure: $500m.

Employment: Construction: 700; Operation: 600

Kalgoorlie - Super Pit Golden Pike Cutback
KALGOORLIE CONSOLIDATED GOLD MINES
Kalgoorlie Consolidated Gold Mines (KCGM) is planning to extend the life of its Fimiston open cut mine by five years to 2017, with the Golden Pike Cutback. This will entail additional tailings storage facilities and waste rock dumps. KCGM is also required to develop a detailed closure plan prior to commencing the expansion. The Minister for Environment endorsed the proposed project in June 2008 subject to additional conditions being imposed that will limit the project's impact on the environment and surrounding residents.

Employment: Operation: 1043

HEAVY MINERAL SANDS

Happy Valley - Heavy Mineral Sands Mine
BEMAX CABLE SANDS (WA) PTY LTD
Located adjacent to the Bemax Gwindinup deposits, the project will involve the mining of mineral sands from two deposits (Happy Valley North and South) located on private land and in State Forest. The level of assessment for the project has been set at Environmental Review and Management Program. Environmental impact studies for the proposed mine development have been completed. Assessment of the project by the EPA will commence by the end of 2008. Happy Valley contains a reserve of around 6 Mt of ore at a heavy mineral grade of 11.3 per cent.

Expenditure: $35m.

Employment: Construction: 100; Operation: 30

Jangardup South - Heavy Mineral Sands Mine
BEMAX CABLE SANDS (WA) PTY LTD
The Jangardup South minerals deposit is situated 54 km south of the Nannup township and adjacent to the D'Entrecasteaux National Park. Cable Sands estimates that the deposit would provide 2 Mt of minerals. Feasibility and environmental studies are well advanced. An environmental impact statement for the project is being prepared.

Expenditure: $60m.

Employment: Construction: 100; Operation: 50

Keysbrook - Heavy Mineral Sands Mine
OLYMPIA RESOURCES LTD
Olympia proposes to develop a mineral sands mine located near the township of Keysbrook, approximately 70 km south of Perth. Olympia has identified proven and probable reserves of 41 Mt of ore containing 1.2 Mt of zircon, ilmenite and leucoxene. The concentrate will be processed at Cable Sands' plant at Bunbury over the mine's eight year life. In late October 2007, the EPA recommended approval of the project subject to Olympia meeting a number of conditions in the development and operation of the mine. The appeals process is close to completion and Olympia anticipates that approvals will be completed by the end of 2008. If Shire approvals are obtained in 2009, then mining is expected to commence in 2010.

Expenditure: $18m.

Employment: Construction: 35; Operation: 30

Shark Bay – Heavy Mineral Sands Mine
GUNSON RESOURCES LIMITED
Gunson proposes to develop the Coburn Mineral Sands project, located south of Shark Bay, which contains total ore reserves of 306 Mt at an average grade of 1.2 per cent heavy minerals. All of these reserves lie within the portion of the project area that has received government environmental approvals for mining. At the proposed mining rate of 17.5 Mt/a, the Coburn mine life is estimated to be 17.5 years. In 2007, Gunson signed memoranda of understanding with Chinese company CTIEC and an electric power supply company in the Chinese city of Bengbu to take a combined 40 per cent interest in the project. CTIEC has subsequently confirmed its intent to take up a 20 per cent interest but the Bengbu power supply company is to be replaced by another investor. It is planned that zircon-rich non-magnetic concentrate from the Coburn mine will be shipped to a mineral separation plant in China for further processing. The magnetic fraction is to be sold in Geraldton as a final ilmenite product containing 62 per cent titanium dioxide.

Expenditure: $100m.

Employment: Construction: 170; Operation: 110

Tutunup South - Heavy Mineral Sands Mine
ILUKA RESOURCES LIMITED
Iluka proposes to develop the Tutunup South mineral sands mine, located approximately 15 km southeast of Busselton. The project will include the construction of mine pits, solar drying dams, ore concentrator and associated mine infrastructure. The mine is expected to produce over 1.2 Mt of heavy mineral concentrate over its five to six year life, which will be transported to Capel for further processing. Tutunup South is scheduled to commence operation in early 2009, subject to obtaining necessary government approvals, and will replace Iluka's Wagerup mine site. The project is currently in the Environmental Impact Assessment phase and is being assessed at the level of Public Environmental Review.

Expenditure: $25m.

Employment: Construction: 150; Operation: 40

IRON ORE

Great Southern Region - Southdown Magnetite Mine
GRANGE RESOURCES LTD
Grange is finalising a bankable feasibility study on the Southdown magnetite project, 90 km northeast of Albany. The company plans to produce an initial 3.3 Mt/a magnetite concentrate stepping up to 6.6 Mt/a. The concentrate will be transported via a slurry pipeline to the Port of Albany for export and pelletising in Malaysia. The project is currently being environmentally assessed at a Public Environmental Review level. Subject to environmental approvals, construction is anticipated to commence in 2009, with commissioning in 2012-13.

Expenditure: $839m.

Employment: Construction: 700; Operation: 250

Mid West Region - Extension Hill Magnetite Mine
ASIA IRON
Asia Iron has primary environmental approval to produce up to 5 Mt/a of magnetite concentrate, which will be transported by slurry pipeline to the port of Geraldton for export. The company is currently seeking secondary approvals.

Expenditure: $715m.

Employment: Construction: 1000; Operation: 350

Mid West Region - Jack Hills Hematite Mine Stage 2
CROSSLANDS RESOURCES
Murchison Metals commenced trucking 1.5 Mt/a hematite from its Jack Hills operations to the port of Geraldton in December 2006. The company expects to increase production to 2 Mt/a in 2008 before proceeding to Stage 2, which would involve a further increase to 10-25 Mt/a of hematite and beneficiation ore. The ore would be transported by a new railway to a new deepwater port at Oakajee. A definitive feasibility study and exploration drilling program on its Jack Hills Stage 2 project is progressing.

Expenditure: $750m.

Employment: Construction: 450; Operation: 350

Mid West Region - Mt Karara Magnetite Mine
GINDALBIE METALS LTD
Gindalbie Metals is developing a magnetite mining operation at Karara, 85 km east of Morawa, based on a world-class 522 Mt Joint Ore Reserves Committee (JORC) reserve plus a 1853Mt JORC Resource. First production is scheduled to take place in the second half of 2010 at an initial rate of 8Mt/a of magnetite concentrate. Feasibility studies are underway on increasing the start-up production rate to 12Mt/a. The mine life is expected to be more than 50 years. Design and engineering work is underway and orders have been placed for long lead items. On-site work is awaiting final environmental approval.

Expenditure: $1.7b.

Employment: Construction: 400; Operation: 240

Mid West Region - Mungada Hematite Mine
GINDALBIE METALS LTD
Gindalbie Metals is developing a direct shipping hematite ore project at Karara, 85 km east of Morawa, based on an initial 10.9Mt JORC Reserve and 16.2Mt JORC Resource. First production is scheduled for the second half of 2009 at a rate of 1.5Mt/a, moving to 2Mt/a. The project is currently awaiting final environmental approval.

Expenditure: $108m.

Employment: Construction: 200; Operation: 170

Mid West Region - Weld Range Iron Ore Mine
MIDWEST CORPORATION LIMITED
Midwest Corporation proposes to develop a 15-20 Mt/a iron ore mine at Weld Range 65 km southwest of Meekatharra, producing a mix of hematite lump and fines. The project is expected to utilise a new rail line and a new deep water port facility at Oakajee. The company commenced an extensive drilling program in June 2006 and is currently completing a pre-feasibility study.

Expenditure: $800m.

Employment: Construction: 900; Operation: 220

Pilbara – Roy Hill Iron Ore Mine
HANCOCK PROSPECTING PTY LTD
Hancock Prospecting Pty Ltd is undertaking a pre-feasibility assessment of the development of the Roy Hill iron ore deposit, possibly Australia's largest undeveloped Marra Mamba iron ore deposit. The deposit is located about 80 km north of Newman. In 2007, the company invested $38 million on a major drilling program to more closely define the iron ore resource. Further infill drilling is continuing. The development program is to move to a bankable feasibility study by end 2008 for a decision on the project by late 2009. The project includes the development of mines, a new railway or third party use of an existing railway, and port facilities at Port Hedland.

Pilbara - Iron Ore Mine Rail and Port Development
FORTESCUE METALS GROUP LTD
FMG Chichester operates a 45 Mt/a iron ore mine at Cloud Break in the Chichester Ranges of the eastern Pilbara. The mine is serviced by a multi-user railway and new port facilities at Port Hedland. First exports of iron ore to China commenced in May 2008.

Expenditure: $3.2b.

Employment: Construction: 2500; Operation: 870

Pilbara - West Pilbara Iron Ore Project
API MANAGEMENT PTY LTD
The Australian Premium Iron Joint Venture is proposing to develop the West Pilbara Iron Ore Project. Stage 1 of the project is based on the production of 20-30 Mt/a of direct shipping iron ore from a group of three mine sites located approximately 50 km southwest of Pannawonica. The ore will be exported via a new railway and port facility located on the Pilbara coast. Subject to the successful completion of feasibility and environmental studies (in process), and receipt of government regulatory approvals, the company anticipates that the first shipment will occur in early 2012.

Expenditure: $3.9b.

Employment: Construction: 1300; Operation: 700

Tom Price - Western Turner Syncline Section 10 Iron Ore Mine
HAMERSLEY IRON PTY LIMITED
Hamersley Iron is proposing to develop a new mine at Western Turner Syncline, situated approximately 20km north-west of Tom Price. The Western Turner Syncline mine is required to supplement, and in the future replace, declining iron ore production from the existing Tom Price mine. Iron ore production from Western Turner Syncline is scheduled to commence in Q1 2011. The final investment decision is expected in late 2009.

Employment: Construction: 35

This section is intended as an overview and does not constitute an exhaustive list of projects within the Western Australian resources industry.

IRON ORE PROCESSING

Pilbara - Austeel Mine and Pellet Plant
MINERALOGY PTY LTD
The Iron Ore Processing (Mineralogy Pty Ltd) Agreement is based on the development of Mineralogy Pty Ltd's Fortescue magnetite deposits, located near Cape Preston, 70 km southwest of Dampier. Mineralogy has sold subsidiary companies with right-to-mine agreements to two purchasing companies, CITIC Pacific Ltd and Australasian Resources, which are planning the development of separate projects under the Mineralogy State Agreement. Australasian Resources Ltd has announced an agreement with Shougang Corporation which will fund a feasibility study on a combined concentrate/pellet and DRI project. If viable, Shougang will fund the project development, with Australasian keeping a 50 per cent interest.

Expenditure: $5b.

Employment: Construction: 2500; Operation: 800

Pilbara - Sino Iron Pellet Project
CITIC PACIFIC
CITIC Pacific, a Chinese company, received Ministerial approval on 2 May 2008 for the development of a magnetite iron ore mine and pellet plant with a capacity of 6 Mt/a. Construction has commenced on a concentrator, pellet plant, slurry pipeline, port facilities, 240 MW power station and desalination plant, as well as accommodation facilities. The company plans to export the first high-grade pellets to China in 2010.

Expenditure: $3.5b.

Employment: Construction: 2500; Operation: 500

MOLYBDENUM

Pilbara - Spinifex Ridge Molybdenum/Copper mine
MOLY MINES LIMITED
The Spinifex Ridge Project is located 50 km northeast of Marble Bar in the Pilbara region of Western Australia. It is based on a resource of 469 Mt at 0.06 per cent molybdenum and 0.09 per cent copper. Moly Mines has completed a definitive feasibility study which has forecast 240 Mlbs of molybdenum concentrate and 270 Mlbs of copper concentrate will be produced in the first 10 years of the operation. The project's processing plant design capacity is at 20 Mt/a. The project is undergoing environmental assessment.

Expenditure: $1.08b.

Employment: Construction: 400; Operation: 375

NICKEL

Goongarrie - Kalgoorlie Nickel Project
HERON RESOURCES LTD
This project will involve a mine and hydrometallurgical processing plant at Goongarrie (about 85 km north of Kalgoorlie) producing up to 50,000 t/a of nickel from laterite resources of 903 Mt grading 0.74 per cent nickel and 0.05 per cent cobalt. Heron and Vale Inco are undertaking a pre-feasibility study which is due for completion in January 2009. Further ore reserve estimation, mine planning and metallurgical testing will be undertaken.

Expenditure: $1.4b.

Employment: Construction: 1000; Operation: 300

Pilbara - Nickel Mine
SHERLOCK BAY NICKEL COMPANY
Sherlock Bay Nickel Corporation owns the Sherlock Bay nickel project, 120 km east of Karratha. The project is comprised of the Symonds and Discovery deposits. The ore body extends over a length of approximately 1.6 km and varies in width between 5 m and 35 m. The deposits contain a combined proven resource of 25.4 Mt at 0.4 per cent nickel, 0.09 per cent copper and 0.02 per cent cobalt. This resource is expected to give a project life of 12 years. Processing of the ore will use the BioHeap bulk heap leach process, which will produce metal with an expected recovery of 88 per cent.

Expenditure: $30m.

OIL & GAS DEVELOPMENTS

Carnarvon Offshore Basin - Gorgon LNG
CHEVRON AUSTRALIA PTY LTD
In December 2007, the Gorgon Joint Venture (GJV) announced its intention to upgrade the project specifications from a 10Mt/a (2 train) to a 15Mt/a (3 train) development on Barrow Island. The project is based on gas from both the offshore Gorgon and Jansz fields. The development on Barrow Island is also to include a domestic gas plant. The GJV obtained environmental approval for a 10Mt/a development in late 2007. In September 2008, the GJV released a Public Environmental Review document for public comment regarding the addition of a third LNG train. Once the GJV has obtained environmental approvals for the additional train and completed front-end engineering and design work for the project, it will consider a final investment decision on the project.

Expenditure: $11b.

Employment: Construction: 3000; Operation: 600

Carnarvon Offshore Basin - Macedon Gas Field
BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED
The Macedon gas field, located about 50 km north of Exmouth, was discovered in 1992 through the West Muiron 3 well, with a follow-up appraisal campaign in 1994. BHP Billiton is continuing to investigate domestic market opportunities for Macedon, which is estimated to contain a gas resource of up to 1.2 Tcf. Gas recovered to date is dry, containing no condensate or LPG.

Pilbara - Devil Creek Development Project
APACHE ENERGY LIMITED
Apache Energy Ltd and Santos Ltd are investigating the development of the Devil Creek Development Project (DCDP), a greenfield gas project comprised of: an unmanned offshore gas production platform over the Reindeer gas field which is located about 80 km northwest of Dampier; offshore and onshore gas pipelines; an onshore gas processing plant site located near Devil Creek, 65km southwest of Karratha; and a sales gas export pipeline connected to the Dampier to Bunbury Natural Gas Pipeline (DBNGP). The DCDP is designed to provide up to 300 TJ per day of dry natural gas and between 160 kl to 800 kl per day of gas condensate. All gas from the DCDP will service the domestic gas market in Western Australia. Construction is scheduled to start by end 2008, with first gas delivered into the DBNGP by mid 2010, subject to receiving all the required statutory approvals.

Expenditure: $600m.

Employment: Construction: 200; Operation: 20

Pilbara - LNG Plant
BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED
BHP Billiton Petroleum and Exxon Mobil are working together to identify the optimal development plan for the commercial development of the Scarborough gas field located offshore in about 900 metres of water and about 280 km northwest of Onslow. The project is examining a number of concepts including the development of an associated 6 Mt/a LNG plant at a site approximately 4.5 km southwest of Onslow. The LNG produced may be sold to the American west coast and Asian energy markets.

Expenditure: $5b.

Employment: Construction: 2400; Operation: 125

Browse Basin - Scott Reef/Brecknock Gas Fields
WOODSIDE ENERGY
Woodside discovered gas and condensate at Torosa (Scott Reef) in 1971, Brecknock in 1979 and Calliance (Brecknock South) in 2000. The fields are located in water depths of up to 800 metres, about 425 km northwest of Broome and 250 km from the mainland. The reserves in these fields are currently held as a contingent resource and are estimated to be in excess of 20 Tcf of gas and 300 Mbbls of condensate. During 2007 and 2008 Woodside (Operator and ~50 per cent interest holder) is planning to continue with field appraisal activities and concept evaluation studies to select a preferred development concept in the latter half of 2008. Woodside is targeting an LNG production facility capable of supporting up to 15 Mt/a of LNG. Start-up of LNG production is expected in the period 2013 to 2015.

Bonaparte Offshore Basin - Tern/Petrel Gas Fields
SANTOS LIMITED
The offshore Petrel gas field, discovered in 1969, is located about 250 km west of Darwin on the WA/NT seabed border in the Bonaparte Basin. The offshore Tern gas field, discovered in 1971, is located about 300 km west of Darwin in WA waters in the Bonaparte Basin. Field development options include installation of unmanned offshore production platforms with a pipeline to a gas treatment plant south of Darwin. The development possibilities for these fields have been enhanced by recent significant discoveries by other parties nearby, which may provide tie-in potential for Petrel and Tern to service domestic gas customers. A conceptual plan involves initial development of Petrel with a pipeline to an onshore gas plant and a subsequent phase that completes Petrel and develops Tern.

Expenditure: $1b.

PLATINUM GROUP METALS

Halls Creek - Panton Sill Platinum Project
PLATINUM AUSTRALIA LIMITED
The Panton platinum-palladium deposit is located 60 km north of Halls Creek in the Kimberley region of Western Australia, and contains the highest grade known in Australia. A bankable feasibility study (BFS) has found that, while the project is technically sound, it is not commercially viable. The company is considering updating the BFS during the first half of 2009 to assess the impact of current higher prices for platinum, palladium and by-product nickel.

Pilbara - Platinum Deposit
HELIX RESOURCES NL
Helix Resources NL has established an indicated resource of 9.2 Mt at 2.9 g/t combined platinum, palladium, rhodium, and gold, 0.2 per cent nickel, and 0.3 per cent copper at its project site near Karratha. Preliminary mining studies suggested a mining rate of combined open cut and underground production of 1.5 Mt/a. Further activity was postponed in early 2003, as a result of poor exploration results and a decreased palladium price. The project is under review.

SALT

Exmouth Gulf - Yannarie Solar Salt Project
STRAITS RESOURCES LTD
Straits Salt is proposing to develop Yannarie Solar Salt, a 4 Mt/a salt operation in the east coast of Exmouth Gulf. It has exploration licences over the area and has applied for a mining lease. The proposal was assessed at the Environmental Review and Management Program level by the EPA. In a statement released on 23 July 2008, EPA Report 1295 recommended against approval for the Yannarie Solar Salt proposal. Straits has appealed against the EPA's recommendation and the matter is currently under investigation by the Office of the Appeals Convenor.

Expenditure: $200m.

Employment: Construction: 100; Operation: 75

TIMBER

Mirambeena Timber Processing Precinct - Engineered Strand Lumber
LIGNOR LTD
Lignor Ltd is proposing the development of an Engineered Strand Lumber/Engineered Strand Board plant located at Mirambeena, near Albany. The plant will source most of its timber from the extensive eucalypt plantations growing in the Albany region and will use technology developed by the German engineering companies Siempelkamp or Dieffenbacher. Lignor has nearly completed its feasibility study. Further project development has been put on hold pending more favourable global financial market conditions.

Expenditure: $350m.

Employment: Construction: 400; Operation: 125

WA resources still powering State and national economies

Data underlining the massive contribution Western Australia's minerals and petroleum sectors make to the national economy was recently released by the Department of Industry and Resources.

It shows that in the 2007-08 financial year, the total value of their sales reached A$58.6 billion, a 9 per cent increase on the previous year.

This accounted for approximately 53 per cent of Australia's mineral and petroleum sales.

State Government royalty receipts from the sectors also grew 10 per cent to a record A$2.3 billion.

Mineral and petroleum exports contributed 83 per cent of WA's A$68 billion total merchandise exports and more than 30 per cent of the national A$179.6 billion total.

The results were achieved despite the strength of the Australian currency, which grew by 13 per cent against the US dollar and is estimated to have effectively reduced potential export revenue by A$9 billion.

Chief Executive of the Chamber of Minerals and Energy Western Australia, Reg Howard-Smith, said the results demonstrated the resources industry's resilience to challenges in the local and global environment.

"These outstanding results were delivered despite rising costs and a shortage of professional and skilled labour," he said.

Mr Howard-Smith said that it might not be possible for the industry to improve on this performance in the short term, given the significant challenges posed by the global economy.

"Prevailing economic conditions mean that resources companies must focus on the least-cost pathway of getting their export commodities to their customers," he said.

"This underlines the importance of coordinated investment in infrastructure, improved logistics and of the State and Federal Governments and industry working with a united vision."

The Department of Industry and Resources data shows that most of the 2007–08 increase came from the iron ore and petroleum sectors.

Together, they accounted for 68 per cent of the total sales value of the State's resources industry.

There was a huge 30 per cent increase in the value of iron ore sales, with 290 million tonnes exported at a value of A$20.5 billion, making iron ore the largest sector, representing 35 per cent of the total value of the State's resources industry.

The State's petroleum industry grew in value by almost 19 per cent to A$19.4 billion.

This sector, which includes crude oil, gas and liquefied natural gas production, represents one-third of the total value of Western Australia's resource industry and 70 per cent of national oil and gas production.

Over the past 10 years the value of Western Australia's mineral and petroleum industry has grown on average by 13 per cent annually.

More resources statistics are available at: **www.doir.wa.gov.au/lateststatisticsrelease**

Western Australian resources in order of value for 2007–08

Resource	Value (billions)
Iron Ore	A$20.48
Crude Oil & Condensate	A$12.67
Nickel	A$5.32
Alumina	A$4.52
LNG	A$5.06
Gold	A$4.07
Others	A$6.49

Significant resource projects in Western Australia

Western Australia continues to lead the way as Australia's premier resources investment destination. There are currently more than A$75 billion worth of projects either committed or under consideration for the State during the next few years. These will create more than 31,000 construction jobs and 9700 full-time jobs.

	Project Value (estimated A$m)	Employment Construction	Employment Permanent
Alumina			
Worsley Alumina - Refinery Expansion	2500	1500	200
Sub Total	**2500**	**1500**	**200**
Iron and Steel			
Asia Iron - Extension Hill Magnetite Mine	715	1000	350
Australasian Resources - Iron Ore Mine	2700	2500	800
Australian Premium Iron Joint Venture - West Pilbara Iron Ore Project	3900	1300	700
BHP Billiton Iron Ore - Rapid Growth Project 4	2850	-	-
BHP Billiton Iron Ore - Rapid Growth Project 5	3200	-	-
CITIC Pacific - Cape Preston Mine and Processing Projects	3500	2500	500
Dampier Port Authority – Dampier Port Expansion	920	800	200
Fortescue Metals Group - Mine, Rail and Port Project	3200	2500	870
Gindalbie Metals - Karara Magnetite Mine	1700	400	240
Grange Resources – Southdown Magnetite Mine	839	700	250
Hamersley Iron - Brockman 4 Mine	1520	-	1500
Hope Downs Limited – Iron Ore Mine	1000	800	280
Midwest Corporation - Weld Range Hematite Mine	800	900	220
Murchison Metals - Jack Hills Stage 2 Hematite Mine	750	450	350
Robe River - Cape Lambert Port Expansion	1100	450	70
Sub Total	**28694**	**14300**	**6330**
Nickel/Cobalt			
Heron Resources - Goongarrie Mine and Plant	1400	1000	300
Sub Total	**1400**	**1000**	**300**
Oil, Gas and Condensate			
Apache - Devil Creek Project	600	200	20
Apache - Van Gogh Oil	600	-	-
BHP Billiton - Onslow LNG Plant	5000	2400	125
BHP Billiton - Pyrenees Oil Project	2000	-	-
Gorgon Joint Venture - LNG Project	11000	3000	600
Santos - Tern Petrel Gasfield Project	1000	-	-
Woodside - Angel Gas/Condensate Project	1600	-	-
Woodside - Pluto LNG Plant	11200	3000	200
Woodside - Vincent Oil Project	1000	-	-
Sub Total	**34000**	**8600**	**945**
Other			
Argyle Diamonds - Underground Mine Stage 1	1200	250	500
BGM - Boddington Wandoo Gold Mine Expansion	2000	1500	650
Burrup Nitrates - Ammonium Nitrate	600	600	65
Aviva Corporation - Central West Coal & Coolimba Power Projects	1000	600	100
Dyno Nobel - Burrup Ammonia Plant	900	1000	130
Griffin Energy - Bluewaters 1 and 2 Coal Fired Power Stations	400	600	50
Griffin Energy - Bluewaters 3 and 4 Coal Fired Power Stations	800	600	30
Moly Mines - Spinifex Molybdenum/Copper Mine	1084	400	375
Straits Resources - Yannarie Salt Project	200	100	75
Sub Total	**8184**	**5650**	**1975**
Petrochemicals			
CSBP Limited - Kwinana Ammonium Nitrate Plant	260	500	-
Sub Total	**260**	**500**	**-**
TOTAL	**75038**	**31550**	**9750**

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