

OLYMPIC DAM EXPANSION EIS

ENERGY AND GREENHOUSE GASES

Olympic Dam's electricity requirements are currently met by two transmission lines – a 275 kV line from Davenport at Port Augusta which meets existing demand and a 132 kV line from Pimba which is used for stand-by purposes.

The proposed construction and operation of the new open pit mine and metallurgical plant would result in a significant increase in energy consumption, particularly electricity and diesel. The major contributors to this would be the addition of haul trucks and other heavy vehicles, electric shovels and additional primary crushers to extract and process about six times more ore than the current operation.

The electricity demand for the proposed expansion would increase over time, ultimately requiring about 650 MW of electricity, consuming 4,400 GWh annually. This would be in addition to the existing operation's 125 MW, and 870 GWh annually, which represents about 10% of South Australia's current baseload demand. The diesel usage would be up to 403 ML per annum in addition to the current operation which consumes around 26 ML per annum.

Current greenhouse gas emissions from Olympic Dam are about 900,000 tonnes per annum (tpa) of carbon dioxide equivalents, which would increase as a result of the proposed expansion. With commitments to reduce greenhouse gas emissions in place, the predicted peak emissions from the expanded operation would be 4.7 Mtpa of carbon dioxide equivalents (with a reportable component of 3.3 Mtpa as per the National Greenhouse and Energy Reporting (Measurement) Determination 2008). This may be reduced by 600,000 tpa as the total electricity demand for the expansion could be sourced from a gas-fired power plant (whether that be located at Olympic Dam or elsewhere).

Reducing energy demand and greenhouse gas emissions

In June 2007, BHP Billiton released its Climate Change Position. The Position aims to improve the management of energy and greenhouse gas emissions across all operations. It also supports the development of low emissions technology and energy excellence projects and encourages emissions abatement by employees and local communities.

Reducing demand

The key commitments to reduce energy demand for the proposed expansion include:

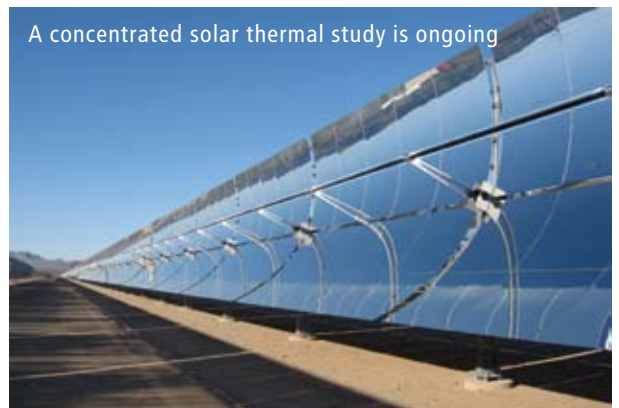
- constructing an on-site cogeneration plant at Olympic Dam to capture waste heat generated by the production of sulphuric acid required for the new hydrometallurgical plant. Over time, and as the operation reached full capacity, this waste heat could be used to generate up to 250 MW
- sourcing the electricity required for the desalination plant from renewable energy.

Expressions of interest were sought from energy companies to supply electricity required for the expansion. BHP Billiton recognises the potential of local solar energy, regional geothermal, and the state's wind resources, and has had discussions with many specialist renewable energy companies. At present, no commercially viable solar or wind energy solution has been identified at the baseload scale required. A concentrated solar thermal study for a supplementary supply of up to 150 MW is ongoing. This would remain a future opportunity for the expansion.

Commercial ventures continue to investigate potential geothermal heat anomalies in the Olympic Dam region, with the intention of proving the feasibility of baseload power generation. As no proven supply currently exists at the scale required for the expansion, this would remain an opportunity for the future.

BHP Billiton has commissioned a study into the use of biodiesel for the Olympic Dam expansion. The Caterpillar engine technology proposed for the open pit haul truck is well suited to the use of a biodiesel blend, however, the security and sustainability of biodiesel supply requires further investigation.

A concentrated solar thermal study is ongoing



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Reducing greenhouse gas emissions

The need to address greenhouse gas emissions through accelerated action is acknowledged in the BHP Billiton Group's Climate Change Position. The key commitments to reduce greenhouse gas emissions for the proposed expansion include:

- reducing greenhouse emissions (reportable under the National Greenhouse and Energy Reporting (Measurement) Determination 2008) to an amount equivalent to at least a 60% reduction (to an amount equal to or less than 40%) of 1990 emissions, by 2050
- producing an annual 'road map' that quantifies emission reduction opportunities and achievements.

If power was sourced via an electricity transmission line from the national electricity market, electricity consumption would make up the majority of emissions from the expanded project. The remaining emissions would come from on-site diesel usage and other sources such as explosives.

The peak emissions of 4.7 Mtpa in 2020 would add 9.8% to South Australia's predicted annual greenhouse gas emissions, 0.74% to the predicted national total and 0.009% to predicted global emissions.

McKinsey and Company's Australian carbon reduction method has been used by BHP Billiton to understand the pathway to reduced emissions at Olympic Dam. It applies the following steps:

- determine a business as usual baseline for future emissions
- identify a range of realistic emission reduction opportunities for the project, and for each opportunity, determine the cost to build and operate it and the reduction in emissions this would achieve
- generate carbon reduction cost curves to establish the best value for money opportunities
- produce an annual 'road map' that quantifies emission reduction opportunities and achievements.

Electricity supply

In order to maintain commercial and technological flexibility, BHP Billiton is seeking approval for two proven primary electricity supply options in the Draft EIS:

- a new 275 kV transmission line between Port Augusta and Olympic Dam, a distance of 270 km
- a 600 MW combined cycle gas turbine (CCGT) power station at Olympic Dam to be supplied by a gas pipeline from Moomba.

The ultimate arrangement could comprise either option or a hybrid of both and would permit the future adoption of renewable energy supplies should they prove viable.

The transmission line would require 700 towers and would parallel the existing line between Port Augusta and Olympic Dam. It would be designed with spare capacity to meet the reasonably foreseeable demand for power at Olympic Dam and in the Roxby Downs area, and to provide 50 MW required for the OZ Minerals copper mine at Prominent Hill, about 130 km north-west of Olympic Dam.

The CCGT power station would use natural gas from the Moomba gas hub. Three alternative alignments were evaluated for a 45 petajoule per annum buried gas supply pipeline:

- Option 1 – 440 km directly from Olympic Dam to Moomba
- Option 2 – 400 km from Olympic Dam linked to the existing Moomba to Adelaide gas pipeline at an existing compressor station
- Option 3 – 560 km from Olympic Dam to Moomba via the existing compressor station and a parallel pipeline to Moomba from that point.

