



Energy and Climate Change - The Issues

Modern societies have an increasing demand for a secure supply of energy. The International Energy Agency's latest analysis from their flagship World Energy Outlook series indicates global primary energy demand is set to increase by 1.7% per year from 2000 to 2030. The increase alone will be equal to two-thirds of the current demand.

With this forecast, the 21st Century world faces a complex series of interrelated challenges including:

- ▶ Improving the standard of living of the majority of the world's population by expanding access to low cost energy;
- ▶ Substantially reducing global emissions of greenhouse gases to combat climate change;
- ▶ Preparing for a world where conventional crude oil reserves become more restricted; and
- ▶ Ensuring that secure access to energy does not threaten global security.

We have now entered an era of challenges posed by the global warming phenomenon and the strong economic growth that is occurring in East Asia. The burning of coal, and other industrial processes producing greenhouse gases, are seen as primary contributors to climate change. Our mission now includes the transformation of our business to confront and manage climate change risks associated with our products.

Various solutions have been put forward by the coal industry to minimise its impact on global warming. Anglo Coal Australia recognizes that, as a leading fossil fuel producer and supplier, we have a role to play in substantially reducing global emissions of greenhouse gases, while at the same time meeting the world's secure energy demands. We see the short- and medium-term challenge for the coal industry lying in the capture of carbon emissions from combustion of coal in a safe and competitive way to produce low or zero carbon energy in quantities that meet market demands.

monash energy

MONASH ENERGY REPORT 2005

ANGLO COAL AUSTRALIA



The Monash Energy Project

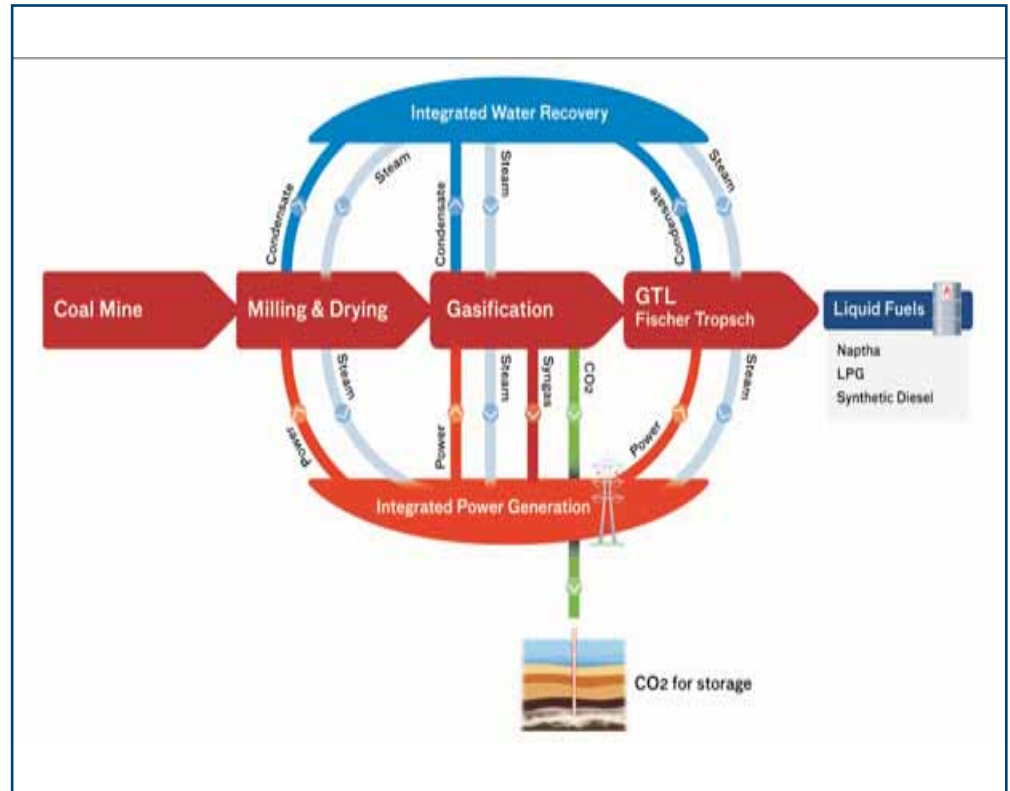
As part of our commitment to reducing global emissions of greenhouse gases we are investigating the feasibility of the Monash Energy Project. This Project involves the gasification of coal from Victoria's Latrobe Valley for ultimate conversion into transport fuels, while separating the waste CO₂ for transport, injection and storage (geosequestration).

The Monash Energy Project encompasses:

- ▶ A Demonstration Plant to integrate the required drying and gasification technologies at a commercial scale;
- ▶ A new mine, supplying brown coal (lignite) at a rate of approximately 25Mtpa from the Flynn field in the Latrobe Valley, over which Monash Energy currently holds an exploration licence;
- ▶ A Coal to Liquids plant including the capacity to capture excess CO₂ and compress it to a supercritical fluid; and
- ▶ The associated infrastructure for transport of the liquefied CO₂ to locations in the depleting oil and gas fields of the offshore Gippsland Basin, for injection and permanent storage deep underground in the geological strata.

The core of the proposed project is a large scale commercial plant in Victoria's Latrobe Valley, drawing lignite from Anglo Coal's own mine and then drying and gasifying the lignite for conversion into transport fuels.

The production process for the Monash Energy project can be described in relatively simple terms, as shown in this diagram:

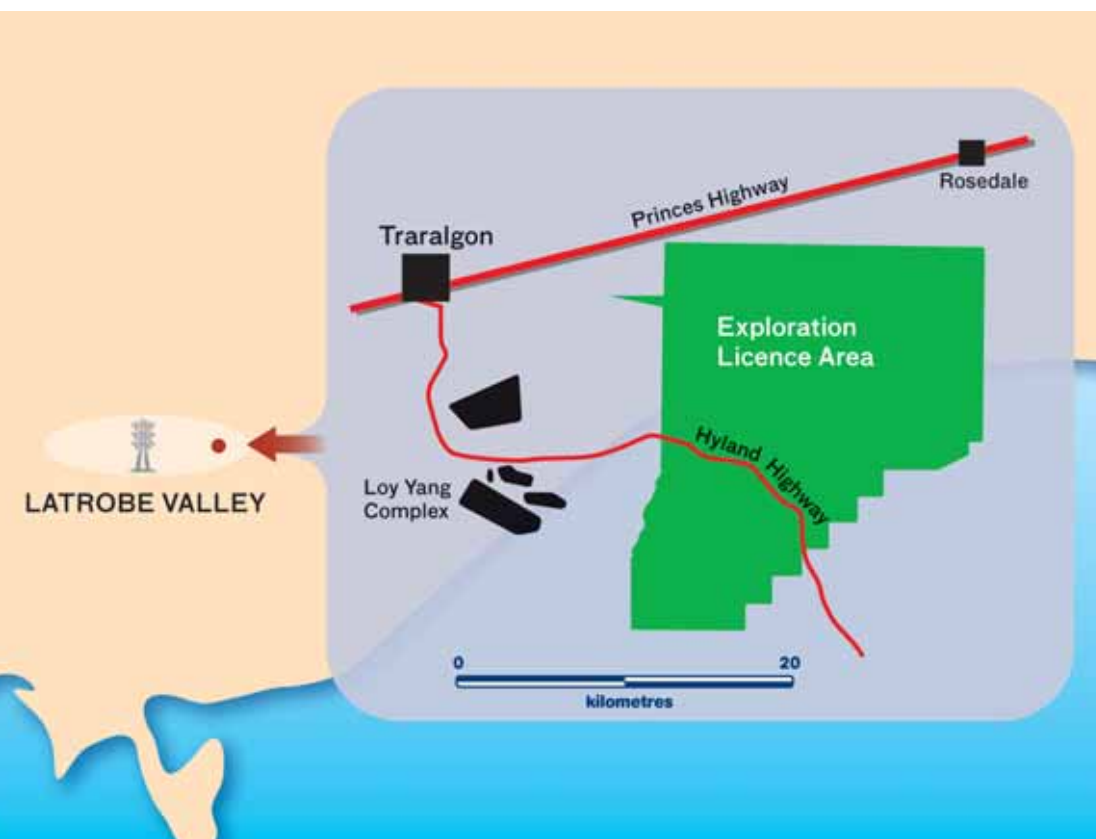


From the mine, the coal is milled and dried, and fed into a gasifier. Following treatment, the synthetic gas output is converted by a "Fischer-Tropsch" Gas-to-Liquids (GTL) process into an ultra-clean synthetic diesel and other transport fuels. CO₂ is removed prior to the GTL step.

The diagram also shows the importance of integrating energy efficiency and water recovery principles into the design of the facility, in line with our commitment to environmental best practice.

Location

The brown coal fuel source and proposed processing facilities are located in the resource rich Latrobe Valley, 160 km to the east of Melbourne, in the state of Victoria, Australia. The Latrobe Valley is one of Australia's major sources of energy-based GHG emissions and is home to the world's biggest brown coal resource. Monash Energy holds an Exploration Licence in the Flynn area, to the east of the Loy Yang mine. Combining the vast lignite resources of the Latrobe Valley with potential CO₂ storage capacity in the Gippsland basin, the location of the Monash Energy Project reflects a world-class combination of a source and a 'sink' for CO₂.



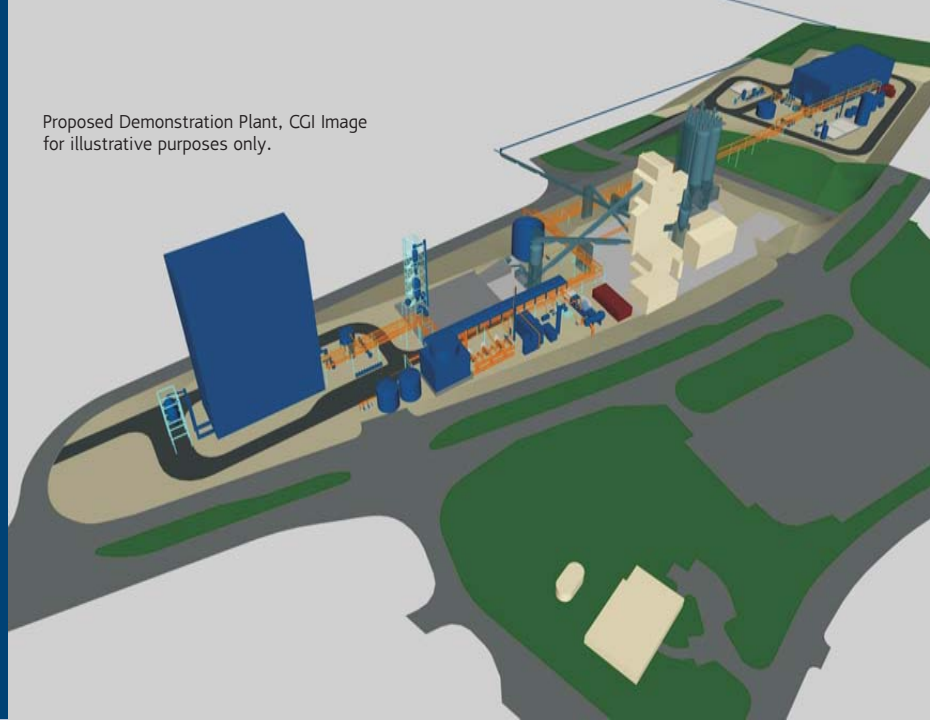
Demonstration Plant

Monash Energy is planning the development of an initial demonstration plant to prove the ability to integrate drying and gasification at a commercial scale and confirm the technical viability of the Coal to Liquids plant and future IGCC power stations.

Current planning is for the demonstration plant to be built in the vicinity of the existing Loy Yang power complex, drawing coal from Great Energy Alliance Corporation's Loy Yang mine. It would produce some surplus electricity for sale into the market, and would have a total throughput of approximately 1 million tonnes of coal over the two to three year period of the trial.

During 2005, the drying and gasification performance of a 1,500 tonne bulk sample of Latrobe Valley lignite was successfully tested in Germany.

Proposed Demonstration Plant, CGI Image for illustrative purposes only.



Carbon Capture and Storage

The emerging technologies of coal gasification and carbon capture and storage (CCS) are both critical to the project's success and, on a broader scale, in achieving a low emissions future for the stationary energy sector.

CCS has been identified by the Intergovernmental Panel on Climate Change (IPCC) as a key technology required as part of the overall global response to climate change. It is expected that the technology will contribute somewhere between 15% and 55% of the cumulative mitigation effort worldwide until 2100.

The project depends on the development of CCS infrastructure in Victoria, which is expected to take the best part of a decade to accomplish. As part of the Monash Energy project, it is the intention that waste liquid CO₂ will be piped from the Latrobe Valley to the Gippsland Basin, and stored more than two kilometres below the surface. The Cooperative Research Centre for Greenhouse Gas Technologies (CO₂CRC) has recently completed a ground breaking technical and commercial study which identified the suitability of the Gippsland Basin, approximately 100 kilometres offshore, for safe and secure storage of 50 million tonnes of CO₂ per annum, with a confirmed capacity of 2 billion tonnes and a probable capacity of at least several times that amount. Critically, the study confirmed the site as meeting the key environmental criterion for 'containment risk', of no more than 1% leakage from underground over the first 1,000 years of storage.

As recognized by the IEA (International Energy Agency), public confidence in CCS as an effective and safe means of storing CO₂ is critical if it is to achieve widespread adoption.

Monash Energy is supporting efforts by State and Federal Governments to put in place an effective legislative and regulatory regime for licensing and oversight of the process.

Regulatory principles have been developed, which will, if mandated, find their way into future legislation.

Monash Energy is also participating in the CO₂ injection and storage trial being developed by the CO₂CRC in the nearby Otway Basin, which is intended to build public confidence in the process. It will demonstrate the scope for safe and secure storage of CO₂ and provide for refinement of the flow modelling that will be necessary.

Conversion of Gas into Fuels

Gasification is integral to wide-scale adoption of CCS, as it enables the most-efficient means of carbon capture through pre-combustion separation of a pure stream of CO₂. The particular form of high-temperature, high-pressure gasification to be trialled by Monash Energy is, quite apart from its role in Carbon Capture and Storage, receiving world wide interest for its potential to ameliorate the non-GHG pollutant load associated with many of the coal deposits the world will need to bring on line in the 21st century.

The Monash Energy project makes its major contribution to meeting the climate challenge by taking forward to commercial scale the gasification technology needed for a new generation of power plants. These facilities, known as Integrated Gasification Combined Cycle (IGCC), in concert with CCS, are seen by the IEA and the IPCC as the key to large scale reduction of emissions from stationary energy creation.

Stakeholder Engagement

A commitment to Stakeholder Engagement is at the heart of Monash Energy's Sustainable Development Framework, and underpins the development of the project.

The Framework clearly establishes the project's approach and relationship to key stakeholder groups such as the traditional owners of the district, the landowners and residents in the vicinity of the Exploration Licence, the relevant local and regional communities, as well as relevant non-government organisations.

To date work has focused on identifying stakeholders, making appropriate contact and initiating discussions and consultations with them on a range of issues.

The Commonwealth Department of Industry, Technology and Resources is responsible for developing CCS, and has been consulting with Monash Energy and other interested parties as it develops legislation to provide a secure legal basis for CO₂ injection and storage in Commonwealth waters (those offshore beyond the 3-mile limit). This legislation is scheduled to be introduced into the Commonwealth Parliament in 2006.

The Commonwealth Department of Transport and Regional Services has also played a key role by providing significant funds for the Latrobe Valley Carbon Storage Assessment, on the basis that this was a key technology for the future of the local power industry

Meanwhile, the Victorian State Department of Primary Industries has taken the lead for the State Government in the development of CCS and in particular of the Monash Energy project. The process for determining environmental issues and assessment procedures has been the subject of productive discussions with responsible agencies such as the EPA and the Department of Sustainability and Environment.

Monash Energy has committed to meeting the highest standards of environmental assessment for the project prior to receiving Government approvals and permits.

Meanwhile, the social dimension in also receiving attention and Monash Energy has discussed with the local municipalities the implication for the social and economic development of their communities.

Internationally, the project is receiving attention from bodies such as the IEA, Carbon Sequestration Leadership Forum, and the Asia-Pacific Partnership for Clean Development and Climate. Monash Energy also works with relevant divisions and projects within the Anglo American groups which have an interest in technology development and reduction of environmental impacts. For instance, Anglo American plc has recently announced its membership in an industry and government consortium in the US to develop the FutureGen demonstration project, which combines IGCC and CCS with hydrogen production.

Next Steps

Monash Energy aims to conduct the Design and Engineering Specification and the environmental approval process for the Demonstration Plant over 2006 and 2007, to enable construction to begun in 2008.

The data and experience gained from the operation of the Demonstration Plant, scheduled to be commissioned in 2010, will provide a secure platform for construction of the Coal to Liquids facility, scheduled for completion in 2016.

monash
energy



For further information
please visit our website:
www.monashenergy.com.au,
or contact Scott Hargreaves
on 03-9868 7812.