CENTRE FOR LOW EMISSION TECHNOLOGY

9th March 2006

The Secretary
Senate Rural and Regional Affairs and Transport
Parliament House
Canberra ACT 2600
rrat.sen@aph.gov.au

To whom it may concern:

Re: Enquiry into Future Oil Supplies and Alternative Transport Fuels

The Centre for Low Emission Technology is seeking to build Australian core technology competencies in this area, which is complementary to our current actions in low emissions electricity and hydrogen production from coal. We are seeking support from the Federal Government under NCRIS, to establish a pilot scale National Low emissions Gasification Test Facility. This facility has the capability of being extended to assist in the implementation of a national program for alternative transport fuels specific to Coal to Liquids (CTL) technology, if additional assistance can be obtained.

The Centre for Low Emission Technology is an unincorporated joint venture with partners who include: the Queensland Government through the Department of State Development, Innovation and Trade; CSIRO through CSIRO Energy Technology and its Energy Transformed Flagship; Australian Coal Research Limited; Stanwell Corporation Limited; Tarong Energy Corporation Limited; and The University of Queensland. More information about the centre is available on www.clet.net.

We appreciate your consideration of the following submission to the Enquiry and look forward to speaking further with you in this regard.

Should you require and further information please do not hesitate to contact our office.

Yours Sincerely,

G.P. Rao

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Dr Kelly Thambimuthu
Chief Executive Officer

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Transport Fuels from Coal

The importance of transport fuels to the economy of Australia, and the dominance of liquid fuels derived from oil, are widely apparent. The net reliance of Australia on imported oil is projected to increase dramatically during the next 15 years. This would be detrimental to Australia's balance of trade, and place the country in a strategically vulnerable position.

Synthetic liquid fuels may be derived from other sources of carbon, including biomass and natural gas. However the undesirability of diverting finite land resources from food into fuel production and the high amenity value of natural gas for many other applications are strong arguments in favour of considering a third source, coal, as the preferred source. Australian resources of coal are very large, accessible, secure and cheap to mine.

Liquid transport fuels may be obtained from coal by Coal to Liquids (CTL) technology. CTL is a sequence of coal gasification to produce a raw syngas, processing the syngas to clean it, capture CO_2 for storage to reduce its carbon content and increase its hydrogen composition, and Fischer-Tropsch (F-T) synthesis of liquids in a catalytic reactor. CTL has been applied at a large industrial scale in South Africa since the 1950's, by SASOL to synthesize liquid fuels and other products from coal. During most of this era of cheap oil the main driver for the technology was strategic, but with oil now forecast to stay above 40$/bbl there is now both a financial and a strategic motive for exploitation. The liquid fuels produced by CTL are very clean, and perform as well or better than fuels that can be produced by conventional petroleum or biomass processing.

However, the gasification and gas processing processes used at SASOL would probably not be acceptable in Australia today. There is a considerable scope to apply more modern gasification systems in CTL; systems such as entrained flow gasifiers have the ability to take the full range of coal sizes produced by a mine, to be cheaper to operate and to eliminate the production of wastes and by-products that may be harmful. These modern gasification processes can be more readily integrated into a plant that could co-produce liquid fuels and electricity for distribution to consumers. There is also a potential for advances in syngas processing that may reduce costs and raise thermal efficiency. Co-processing of locally available biomass with coal in such a plant is both an effective and reliable means to exploit the Carbon Cycle benefits of a renewable fuel.

Elements of the technology described above are commercially available, but there is much scope for refining the existing technology to suit the requirements of an Australian scenario. In order to reduce the commercial and technical risks associated with the implementation of these new technologies and thereby facilitate their uptake, it is proposed that it is in the national interest to establish a relatively small gasification pilot plant of around $5MW_{th}$ in Australia. This plant (shown in outline in Figure 1) will provide a facility for testing Australian coals at a realistic scale to assess feedstock and the impact on gasifier performance, and the development and integration of advances in dry gas cleaning. Such a facility will also provide for the testing of advances in syngas processing and F-T synthesis that are conceived in Australia and elsewhere to the position of readiness for commercial demonstration. It is intended that the facility will also provide the experience and training needed for Australian industry to become an informed buyer and user of those elements of the technology that may need to be imported.

It is also envisaged that, as other countries implement gasification based CTL systems, this facility will be required to provide a relevant coal test and evaluation capability to support the Australian export coal industry in these new markets.

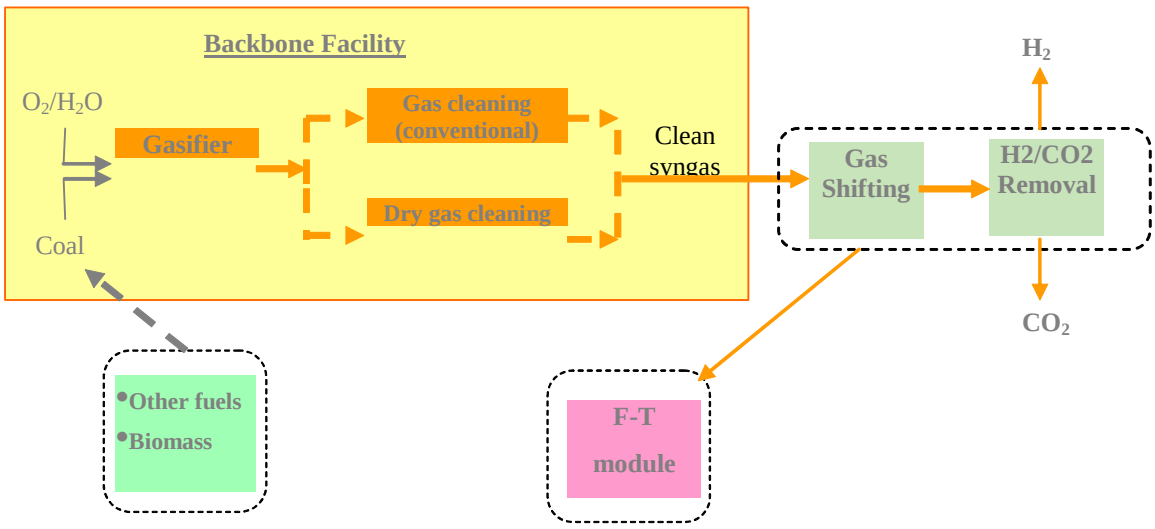

Figure 1 Scheme of the Proposed Facility, showing potential downstream processing and F-T module

A consortium of industrial partners is being put together by the Centre for Low Emission Technology (cLET), prior to seeking federal support under the National Collaborative Research Infrastructure Strategy (NCRIS) to build core capabilities in the use of coal in advanced gasification based processes for low emission electricity, hydrogen and F-T liquid fuels production.

Submission by

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