

Support material #5: Queensland 'Clean coal' information

Queensland to stage world-first clean coal power plant

Date: Wednesday 26 July 2006

Publication: Queensland Business Review (QBR)

Website: www.qbr.com.au/index.cfm?storyid=27856&cp=displaystory

Shell has signed an agreement to provide specialist expertise for the next stage of Stanwell Corporation's project to build the world's first power plant incorporating two clean-coal technologies, Premier Peter Beattie announced today.

'This is a major step forward in the Smart State's commitment to developing clean coal technology to dramatically lower carbon dioxide emissions in the fight against climate change,' says Beattie.

'The agreement with Shell, a world leader in underground carbon dioxide storage technology, provides a major boost to the project which aims to build a demonstration generation plant producing baseload electricity through integrating coal gasification and the capture and safe storage of carbon dioxide.

'This is a major coup for the Smart State, for the coal industry and for the environment which will give Zerogen access to the full range of Shell's intellectual property in this area.'

Now Shell has signed an agreement to provide highly-specialised advice and technical support services to ZeroGen, a Stanwell subsidiary, in a test drilling program which started last month.

'This drilling program is to determine the geological suitability of rock formations in the Springsure-Emerald area for carbon dioxide sequestration – the safe and secure storage of carbon dioxide from the power plant in deep salt water aquifers,' Beattie adds.

'ZeroGen would be the first power generation project in the world to combine this sequestration with coal based gasification, making it an initiative of national and international importance.

'Coal gasification is the cleanest method for converting coal's energy potential into electricity.'

Stanwell is a Queensland government-owned corporation with a diverse range of generating assets including coal-fired thermal, wind and hydro-electricity generation facilities in Queensland and other states.

The power plant is proposed to be built in Rockhampton.

If the drilling results are as expected, construction is due to start in the second quarter of 2008, with completion in 2010.

The proposed demonstration facility will produce up to 100 megawatts of electricity and has the capacity to capture and store up to 420,000 tonnes of carbon dioxide a year.

The carbon dioxide would then be taken by pipe 220 kilometres to the saline aquifers deep underground near Emerald for safe storage.

There would be between 500 and 700 construction jobs and

50 to 100 permanent jobs.

As part of the agreement, Shell will be offered up to a 10 per cent equity position in the project.

'I can also announce today that the Co-ordinator-General has declared Zerogen a significant project which triggers the development of a comprehensive environmental impact statement process for the project,' Beattie says.

'This will ensure we explore all of the potential environmental, cultural, social and economic impacts associated with the project, including an extensive consultation program with a wide variety of people and organisations.

'In addition to enabling Queensland to use its massive reserves of coal to produce hundreds of years of safe, reliable and environmentally-responsible electricity, the success of this project would open enormous export opportunities for the technology.

'Because of this, the Queensland government has ear-marked \$300 million from the Queensland Future Growth Fund to develop clean coal technology.'

Coal Industry Develops Clean Technology

Date: Monday 7 August 2006

Website: www.abc.net.au/ra/innovations/stories/s1703068.htm

A new type of clean coal technology that will dramatically reduce greenhouse gas emissions.

Transcript

BLANCH: As the argument that nuclear energy is cleaner and greener than fossil fuels gains ground, the coal industry counters that, with their development of a new type of clean coal technology that will dramatically reduce greenhouse gas emissions. Power stations using this non-polluting form of coal technology could come on stream in the next four to five years. But does it all add up financially.

Peter McCutcheon reports.

McCUTCHEON: In a Brisbane laboratory, engineer Dr. Joe da Costa, is working on cutting edge technology could stop greenhouse gas pollution.

He's perfecting one of the world's smallest sieves that can separate carbon-dioxide from hydrogen.

This means in theory, a non-polluting source of power from that much maligned fossil fuel coal. Many people think of coal as a dirty 19th Century type technology. Do you think that's about to change?

DR DA COSTA, CENTRE FOR FUNCTIONAL NANOMATERIALS, QLD UNI: I think it is changing already.

PROFESSOR IAN LOWE, AUSTRALIAN CONSERVATION FOUNDATION: The coal industry really is in a position where it has to reinvent itself if it wants to survive.

McCUTCHEON: Australia is at the forefront of research for

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clean coal technologies. But the jury is still out on when and how this technology will be moved from the laboratory to widespread industrial use.

And a key challenge will be how to provide financial incentives for the coal industry to change.

PROFESSOR JOHN QUIGGIN, ECONOMIST, QUEENSLAND UNIVERSITY: What we need is to give industry a price signal that carbon emissions are costly and then let industry work out the best way of reducing emissions.

McCUTCHEON: Clean coal technology basically boils down to capturing carbon dioxide and storing it somewhere else and to some extent industry can already do this. The Queensland Government-owned CS Energy recently applied for federal funding to convert this decommissioned power station, Calide A into an almost greenhouse gas free energy producer.

But there's one big obstacle to widespread use of this technology. It's simply too expensive.

DR KELLY THAMBIMUTHU, CENTRE FOR LOW EMISSION TECHNOLOGY: Those cost figures that we currently estimate as being 50 per cent more, say, in the price of electricity than it would producing electricity without CO₂ capture.

McCUTCHEON: Dr Kelly Thambimuthu, is the chief executive of the recently established Centre for Low Emission Technology in Brisbane. His Centre is focusing on the single most expensive part of clean coal technology, how to capture carbon dioxide emissions.

Dr Thambimuthu is liaising closely with CSIRO scientists in looking at ways of turning coal into a gas and extracting separate streams of hydrogen and CO₂.

DR THAMBIMUTHU: Two-thirds of the cost of capture, transfer and storage is in the capture area.

DR JOE DA COSTA: I just want to show you one of those membranes to make here.

McCUTCHEON: Can I touch it?

DR JOE DA COSTA: Sure.

McCUTCHEON: The Centre is also taking a keen interest in Dr da Costa's tiny sieve which separates carbon dioxide at the molecular level. And there's billions of holes in this?

DR JOE DA COSTA: Yes that's right.

McCUTCHEON: And can you really design a sieve that small on a large industrial scale?

DR JOE DA COSTA: We can. We have the technology here. We're taking the technology to a stage in three years that it will be able to compete against those conventional mature technologies.

VIDEO: Instead of burning coal, coal gasification opens new possibilities.

McCUTCHEON: But how far away are we from turning science fiction-type animations like this one, presented to a 2004 International Energy Agency conference, into reality? Well,

according to Dr Thambimuthu, it all depends on how much society is willing to pay for its electricity.

DR THAMBIMUTHU: If they were willing to tolerate that higher cost now, we could implement the first solutions, say, within a five year time frame.

McCUTCHEON: Within five years?

DR THAMBIMUTHU: Within five years, provided that we are willing to tolerate a higher cost.

PROFESSOR IAN LOWE: I certainly think that we can use coal more cleanly than we have in the past and clean coal has to be better than dirty coal.

McCUTCHEON: Environmentalists cautiously welcome but are reluctant to wholly embrace clean coal technology, with concerns about mining practices and the safety of underground CO₂ storage. But Australian Conservation Foundation President, Ian Lowe agrees one of the biggest hurdles to overcome is an economic one.

PROFESSOR IAN LOWE: But at the moment we don't charge for releasing carbon into the atmosphere and so it is more costly to use coal in a clean way than it has been to use it in a dirty way, just polluting the atmosphere. So until the technology is proven and until there are economic incentives to use it, we're probably not going to see it happen.

McCUTCHEON: There is no financial incentive for industry to move from dirty to clean technology, is there?

PROFESSOR JOHN QUIGGIN: That's right, and in the case of carbon emissions there's no reason at all, unless we have some, either a carbon tax or an emissions trading scheme, even if it was very cheap, there'd be no pay-off to industry from adopting it.

MALE: And then there's strong potential for collaboration on this particular project.

McCUTCHEON: Nonetheless, with close to \$1 billion in combined funding from Federal, Queensland and Victorian Governments, industry is working closely with scientists to fine-tune clean coal technology. For this meeting of the research and investment committee to the Centre for Low Emissions, it's a question of when, not if, this new technology is introduced. Coal may never be as clean and green as renewable energy sources like wind and solar. But while researchers like Dr Joe da Costa work on cheaper ways of capturing greenhouse gases, coal may still be a major source of power well into the 21st century. Do you think in your lifetime you will see clean coal technology used on a large industrial scale?

DR JOE DA COSTA: Yes, I think for the next 20 years, those ones are going to be in place already.

McCUTCHEON: 20 years away?

DR JOE DA COSTA: Yeah.

BLANCH: From the 7.30 Report, Peter McCutcheon, who was talking to Dr Joe da Costa, from the Centre for Functional Nanomaterials, at the University of Queensland.