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**TO:** Company Announcements Office

ASX Limited

**FROM:** Company Secretary

**DATE:** 3 November 2011

**SUBJECT:** Queensland Coal Seam Gas: Fuel for the Future

**Address to Australian Institute of Company Directors** 

Please find attached an address by David Knox, Chief Executive Officer and Managing Director, presented to the Australian Institute of Company Directors in Brisbane on Thursday 3 November 2011.

**David Lim** 

Company Secretary



#### Santos

#### Queensland Coal Seam Gas: Fuel for the Future Address to Australian Institute of Company Directors

David Knox, Chief Executive and Managing Director

Brisbane, 3 November 2011

Thank you Madonna [King, MC]

I am very pleased to be in Brisbane again, and in particular to address the AICD.

This is a very exciting time for Queensland.

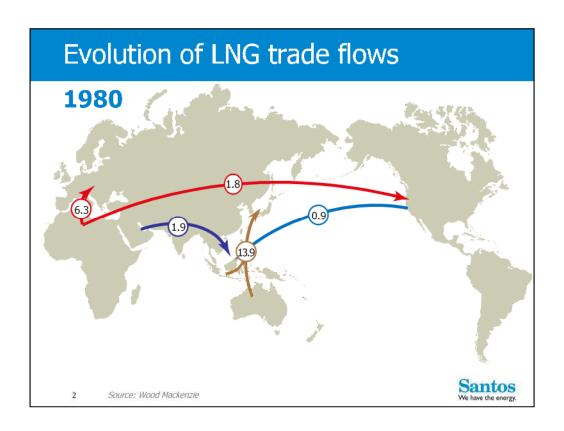
In the 30 years I have been in the oil and gas industry I have seen some dramatic developments in the global energy business - and what is happening in Queensland right now is among the most exciting.

The creation of a new globally significant industry in this state over the past five years has been extraordinary – and Santos has been at the forefront of this new industry from day one.

I would like today to talk about several things:

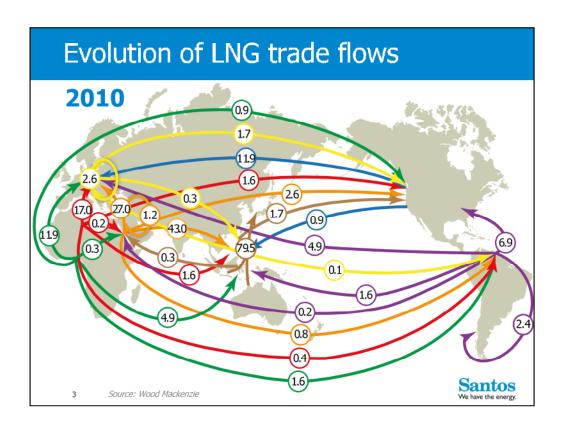
- 1. The dramatic impacts of rapidly growing Asian energy demand which more than any other factor has driven the development of the global LNG business over the past 30
- 2. The significant role Queensland will play in meeting this demand
- 3. The opportunities created by the emergence of this new industry, and
- 4. Some of the challenges Santos and other leading companies are facing in ensuring these opportunities are realised.

Santos and our partners in the GLNG project – PETRONAS, Total and KOGAS – are absolutely committed to meeting these challenges and creating these opportunities.



The growth of the LNG industry over the past 30 years has been remarkable – and has transformed the energy markets of the 22 countries who rely on liquefied natural gas for at least a share of their fuel mix.

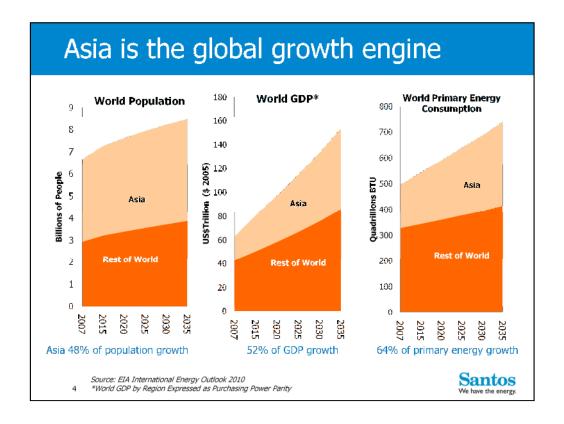
While the first LNG plants were established in the 1960s – firstly in Algeria and later in Alaska – by 1980 there were still only six sellers and six buyers in the global marketplace, and LNG trades represented just 2% of global gas consumption.



By 2010 the LNG trade map looked very different – and this network of energy commerce does not yet include entry of Queensland, where over 20 million tonnes per annum of LNG will be exported by 2016.

Analysts Wood Mackenzie forecast that the global LNG trade will grow from 218 mtpa in 2010 to 345 million tonnes by 2020 – equating to a compound annual growth rate of almost 5%.

The sanctioning of the first unconventional gas-based LNG projects here in Queensland over the past year is a significant moment in the industry's history.



The engine of this growth is Asia as its people seek better standards of living, and sustained economic growth.

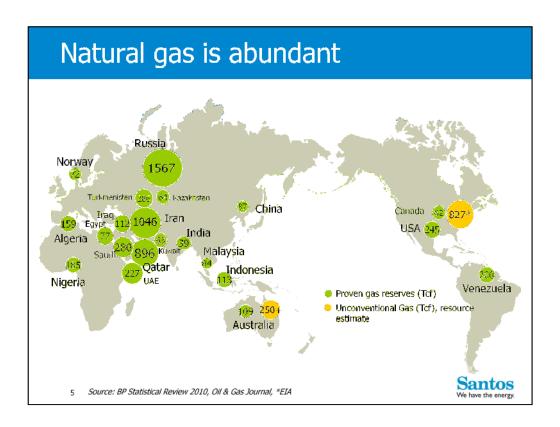
These forecasts are the EIA's.

They show that from 2007 to 2035:

- •Asia is expected to account for 48% of global population growth
- •52% of global GDP growth
- •And a remarkable 64% of growth in primary energy consumption

Furthermore, in a carbon constrained world, natural gas has a big role to play in reducing power generation emissions.

Australia's abundant reserves of natural gas provide Asian economies with a lower carbon alternative to coal – offering less than half the carbon emissions intensity of the region's dominant energy source.

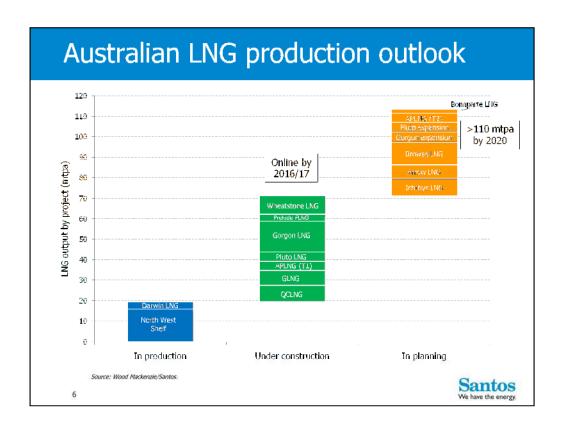


The opportunity to supply natural gas to an energy hungry world is great, but so is the number of potential sources of that gas.

This map shows the world's conventional proven gas reserves and unconventional gas resources in North America and Australia. It confirms coal seam gas resources in Queensland and northern New South Wales are globally significant.

While Australia ranks 14<sup>th</sup> in the world's top proven gas reserves holders, there are a number of important factors to consider:

- Australia's low sovereign risk and relatively stable fiscal regime
- · Australia's proximity to the growing markets of Asia
- ·Australia's world-scale undiscovered conventional and unconventional gas resources, and
- •The access to reserves and production which Australia offers international gas companies, thereby encouraging the LNG developments we see today.



Australia's potential in the global LNG business is truly significant.

Right now, Australia produces 20 million tonnes out of total annual world production of around 235 million tonnes per annum.

But a third of all planned production by 2020 could come from Australia.

Now not all the planned LNG projects will be developed – in Australia or elsewhere – but clearly Australia's significance in the global LNG marketplace is expanding.

In Queensland, there have been over 20 mtpa of Coal Seam Gas to LNG projects given the green light in the past 12 months. While in the West, an additional 30 mtpa LNG supply is currently under construction from the Gorgon, Pluto, Wheatstone and Prelude projects.

Along with other projects being planned this means that by 2020, Australia could produce 100 mtpa of LNG – five times current levels. Of that, 73 mtpa will be online by 2016/17.



In this area, Santos is very well positioned with an LNG portfolio unique for a company of our size:

- Darwin LNG, operated by ConocoPhilips, has been in operation since 2006.
- In PNG, with operator Exxon Mobil, production is due to commence in 2014.
- Our GLNG project in Queensland of course involves converting coal seam gas to LNG. We are on track for first cargo in 2015.
- And, Bonaparte LNG, a joint venture with GDF SUEZ, is set to become one of the world's pioneering floating liquefaction projects, which construction expected to commence in 2014.



Santos is sustaining such large growth by collaborating with world-class partners.

- Darwin's output is sold under long-term contracts to Tokyo Electric and Tokyo Gas.
- PNG LNG has signed similar long-term agreements with Tokyo Electric, Osaka Gas, Sinopec and CPC in Taiwan.
- And GLNG has sold 7 million tonnes per annum to our partners PETRONAS and KOGAS who will develop the project along with France's Total.

This means Santos has strong relationships with seven major Asian LNG customers. Many of our customers are equity partners in the projects as well.

These customers and partners will play a fundamental role in the transformation of Santos from an Australian exploration and production company to a leading natural gas producer providing energy to Australia and Asia.

### CSG: A regional industry

- Queensland CSG industry
  - >\$50 billion investment
  - 18,000 new jobs
- Economic benefits of GLNG
  - \$2 billion already invested in Queensland
  - 2,000 jobs already created
  - 6,000 new jobs in total, including 1,000 ongoing
  - \$40 billion in Federal taxes
  - \$6 billion in State revenues





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I'd like now to focus specifically on the opportunity here in Queensland, where we have seen the rise of coal seam gas exploration, development and production.

Coal seam gas is natural gas and already accounts for 90% of Queensland's gas production.

Queensland now has three major projects: the Santos GLNG project; BG's QCLNG and Origin's APLNG are all underway at the moment, and another – Shell and PetroChina's Arrow project – is in advanced planning stages.

To succeed, these projects must meet four key challenges:

- 1. First, accessing sufficient high-quality gas reserves to fuel these major projects.
- 2. Secondly, adopting an approach to upstream gas production that enables efficient and economic drilling and operation of a large number of wells simultaneously.
- 3. Thirdly, managing the logistics of bringing a large number of wells into production, then operating them for at least 20 years.
- 4. And finally, doing all this in a responsible manner, whether it be in regard to water, environmental management or genuine community engagement.

You often hear about the big numbers involved in this new industry – \$50 billion worth of investment, 18,000 new jobs, \$6 billion in royalties revenue.

In fact, Santos GLNG alone will pay royalties of around \$500,000 a day, enough to build a primary school every 50 days.

Already, over 1,500 Australians are directly working on the Santos GLNG project. At the peak of construction activity over the next couple of years employment on the project will be 6,000 jobs.

Santos understands that this significant development will not proceed without strong community and government support. This support will not be forthcoming unless Santos, and other CSG companies, can address genuine community concerns about the impacts of our activities.



Currently there is a lot of noise in the public discussion of coal seam gas.

Many of the concerns raised are false or exaggerated, but the genuine concerns centre on two key themes:

- · The impact of CSG on traditional agriculture, and
- The impacts on water both the quality and quantity of water available for other uses.

Let me address those concerns directly.

Firstly, our impact on agriculture.

Ironically, it is because CSG can co-exist with agriculture that there is a debate about this issue. Traditional mining generally requires the outright purchase of land, displacing agriculture altogether.

CSG is different. We can operate side-by-side with farmers – and we do. Where we have purchased land, like in the Fairview area, we continue to run agricultural operations on the property. Currently we are running almost 900 head of cattle near Fairview – that's not a business I envisaged leading when landed on my first oil rig in the North Sea 30 years ago!

In terms of access to land, Santos already has about 520 agreements in place with about 200 landholders across the Surat Basin. Our negotiations have been successful because we've approached landholders respectfully and worked with them every step of the way.

If we can locate our infrastructure in a way that minimises our impact on existing operations, we will. If it makes sense to upgrade things like fences or roads to support our operations, we will. And of course we pay fair compensation for the impact that we have.

A fairly typical example might be a farm with six wells, access roads and some underground flowlines. In such a case the landowner would receive an initial payment of about \$45,000 and an ongoing payment of around \$15,000 a year. This is an important and reliable source of income regardless of droughts or floods.



Production well at Scotia, Queensland



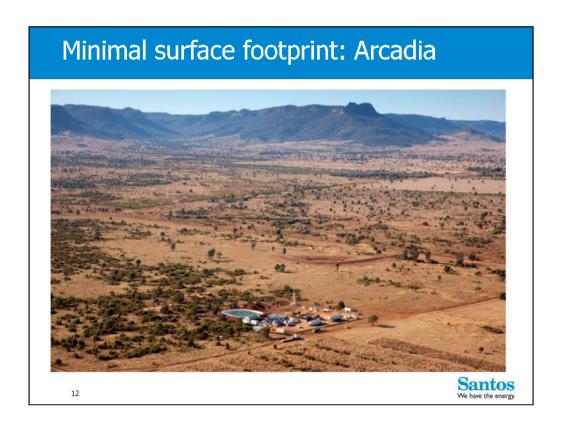
One reason we can work so closely with agriculture is that the footprint of our operations is actually quite small.

This photograph is evidence that farming continues alongside our operations.

When we actually drill a well, the site is about the size of a football field. Once the well is established, the site is then reduced to the size of an average living room. When production finishes, the well is sealed with cement and the rehabilitation of the land begins.

The following few photographs demonstrate the reality of what we are talking about. These sites are very small in the environment in which they sit.

Cattle can graze right up to the fences just metres from our wells. I don't think you could say this about any other form of resource extraction!



This is a shot I also really like. You don't get scenery like this in Scotland!

This is the Arcadia Valley. The photo shows a well that is being drilled and completed in order to commence water and gas extraction.

Now, this is as big as our footprint gets for the development of a well. It will reduce back to a the size of a living room when the well is up and running and producing gas and we have remediated the site.



I'd like to take a closer look at issues surrounding the management of water extracted form coal seams to enable the production of CSG.

We recognise that water is one of, if not the most important community issue associated with the development of the CSG industry.

However it is an issue where a lot of highly emotive and inaccurate claims have been made. It's important to get the water usage into perspective.

Our groundwater impact assessments in Queensland have been reviewed by both state and federal governments as part of the environmental approvals process. Both governments concluded that with appropriate management, groundwater impacts will be minimal.

By way of example, in 14 years of commercial coal seam gas production in the Fairview field there has been no change in aquifer levels.

Santos' CSG operations produce water which is treated and then used for agriculture and town use. We have made significant investments in reverse osmosis water treatment to ensure water produced can be beneficially used.

For example, we are using treated water from our operations to irrigate millions of indigenous eucalypts – and as this photo shows, for forage crops.



As part of efforts to build better understanding about the impacts of coal seam gas production on water – and in the interests of complete transparency – just this week we have launched the Santos Water Portal.

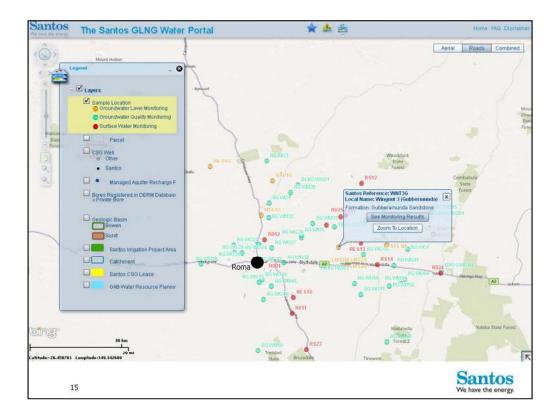
This Australian-first initiative which will make all the company's Surat and Bowen Basin water testing results available for the community to view. It represents a strong commitment to openness, accountability and environmental excellence in the sustainable development of Australia's resources industry.

We have done this because we want to be completely open and accountable with the community in relation to the impact of CSG activities on water quality and groundwater levels.

I commend the site to you.

It can accessed at www.santoswaterportal.com

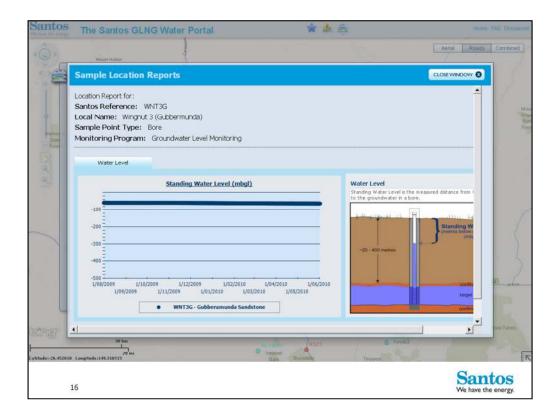
If I may, I'd like to take you on a brief tour.



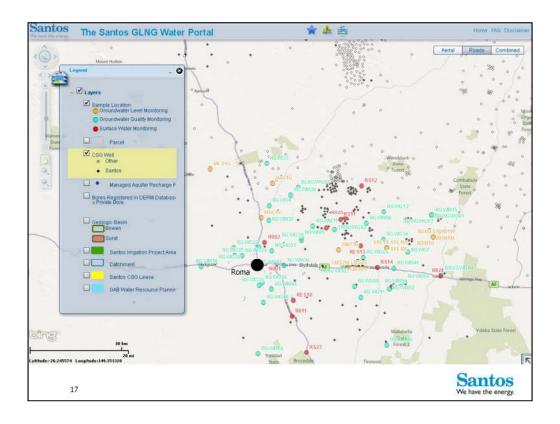
The site enables you to look at CSG wells, water monitoring wells and even traditional water bores. Santos will be actively monitoring over 100 locations across our fields to confirm our modelling and give us an early warning of any impacts from our operations. The portal can show the results of this monitoring program.

We began surface water monitoring back in 1999 so we are actually building on over 10 years worth of data.

This monitoring network will detect any changes in groundwater quality or quantity early and allow us to manage potential impacts appropriately.

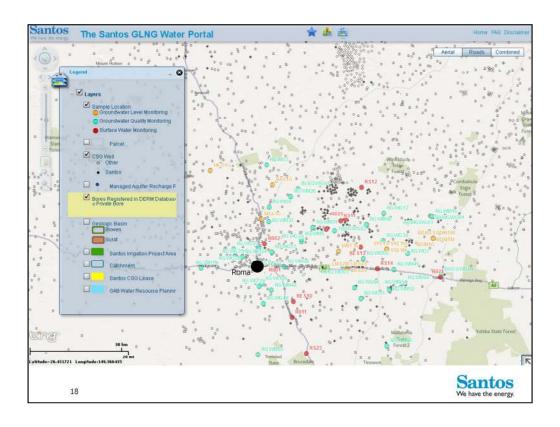


Here for example you can see the unchanged level of groundwater monitored by the Wingnut 3 bore near Roma.



Aside from specific data on individual wells, our water portal is a good indicator of the scale of drilling that has taken place.

Here you can see all the CSG wells drilled in the region around Roma.



In this slide I have added all the private water bores drilled by the region's farmers.

It is these bores and thousands more that extract 83% of all water taken from the Great Artesian Basin.

The data you can access on the water portal underlines our absolute confidence that our CSG activity will have no impact at all on the viability of the Great Artesian Basin.



But if all that data doesn't convince you, perhaps this image will.

It is further evidence coal seam gas produces – not reduces – water for agriculture.

The forage crop seen here, landowners Ree and Leon Price and Santos GLNG President Mark Macfarlane are all a picture of fine health – and they all are drinking coal seam gas water.

In a Queensland-first partnership between a CSG company and a private landholder, Santos is providing the Prices with a pivot irrigation system to cover 72 hectares of farming land and a subsurface drip irrigation system to further irrigate an additional 30 hectares.

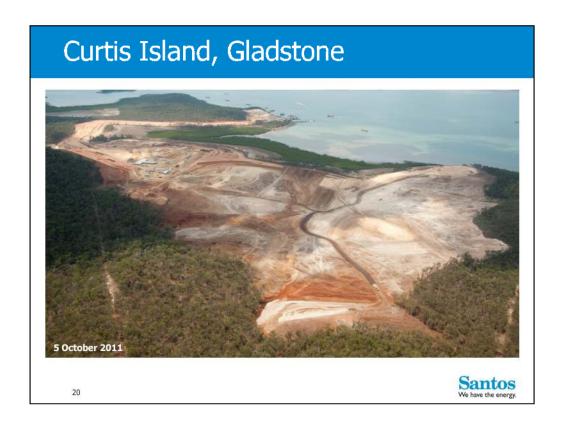
Productivity on this land could increase up to 25 fold during CSG water production.

This is taking a waste product – CSG water – cleaning it up effectively to drinking water quality and putting it to productive use for the benefit of the community.

Another important initiative is the work we are doing with URS and the CSIRO to supplement Roma's town water supplies.

Over the past 100 years, groundwater pressure in the Gubberamunda sandstone aquifer has been declining due to urban, industrial and stock watering usage. Initially, we're looking to inject around 10 mega litres of treated CSG water per day into the aquifer.

In total, we will supply the equivalent of more than 50 years worth of water consumption to the town. It is also likely to lead to an improvement in the quality of Roma's water supply.



I've spent a lot of time talking about what we call the upstream side of our project, but in the midst of a debate it's often forgotten that in Queensland these CSG-to-LNG projects are going full-speed ahead.

In Gladstone, we are substantially progressed with the construction of a multi-billion LNG facility, which will transform the gas into LNG ready to ship. We have sold LNG for over 20 years to our partners Petronas and Kogas.

The picture you can see is our plant site on Curtis Island in Gladstone Harbour. Since our FID in January, our contractor Bechtel has made rapid progress.

In less than four years from today, the first LNG tankers will leave this site bound for Malaysia and Korea.

This industry is no longer a prospect – it is a reality. Contracts have been signed, construction is well underway and we have about 1,500 people already working in Australia on the project and materials arriving every day.

In Queensland, you have only to take a trip to Gladstone to be in awe of the level of activity and to understand the substantial benefits through the multiplier effect for the economy. Our project alone has let around \$3 billion worth of contracts to Australia contractors.

The LNG industry is underpinning future economic growth in this State.

## Our actions speak for us

- We can co-exist with agriculture and boost the productivity of grazing operations through better utilisation of CSG water.
- We can do this in a way that is safe and sustainable, and with no impact on the viability of the Great Artesian Basin.
- We will deliver a once in a generation economic opportunity for Queensland's great regions – and we can all share in that prosperity.









Santos We have the energy

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Ladies and gentlemen, in summary, I hope I have highlighted that Santos:

- •Can co-exist with agriculture and enhance its productivity
- •That our operations are safe and sustainable, and
- Is delivering real economic benefits to the wider community.

Of course, we could go into more detail on all these issues – and I am happy to take any questions you may have – but we firmly believe coal seam gas can be developed safely and sustainably with minimum environmental impact and in partnership with landholders and local communities. In Queensland, it is well underway.



The rewards of getting it right are enormous: our Australian and Asian customers will benefit from the energy security and environmental benefits of natural gas, while Australia will benefit from the jobs, investment and tax revenue.

With our significant resource base, a 50-year track record safe and reliable operations and commitment to genuine engagement with the communities in which we operate, Santos is excited about the role we will play in delivering these benefits.

Thank you.

# Disclaimer and important notice

This presentation contains forward looking statements that are subject to risk factors associated with the oil and gas industry. It is believed that the expectations reflected in these statements are reasonable, but they may be affected by a range of variables which could cause actual results or trends to differ materially, including but not limited to: price fluctuations, actual demand, currency fluctuations, geotechnical factors, drilling and production results, gas commercialisation, development progress, operating results, engineering estimates, reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory developments, economic and financial markets conditions in various countries, approvals and cost estimates.

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