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All references to dollars, cents or \$ in this document are to Australian currency, unless otherwise stated.



## Asia's Energy Security – The Role of Gas

Martyn Eames - Vice President Asia Pacific

SEAAOC: Darwin 20<sup>th</sup> September 2012



It's a great pleasure to speak to you today at SEAAOC, an event that Santos has spoken at for a number of years, and one which is in many ways in lock-step with the energy challenge we are facing today, and our company's strategy.

Today, I'd like to explore this energy challenge with you in more detail, and I am going to do that by focusing on a few points.

- First I'll look at how this energy challenge is playing out in the region.
- Second, I'll explore the role that gas is playing in addressing this challenge and at the same time contributing to a new era of economic prosperity for Australia.
- Third, I want to look at Santos' experience – and provide you with some examples of what we are doing to deliver solutions for the region. One example is the PNG LNG project – pictured on this slide – where you can see work underway on the first well in the Hides field.

# Supporting investment



But before I take you on that journey let me say it is great to be here in Darwin, a city which in many ways lies at the heart of the abundant opportunities emerging in Australia's natural gas industry.

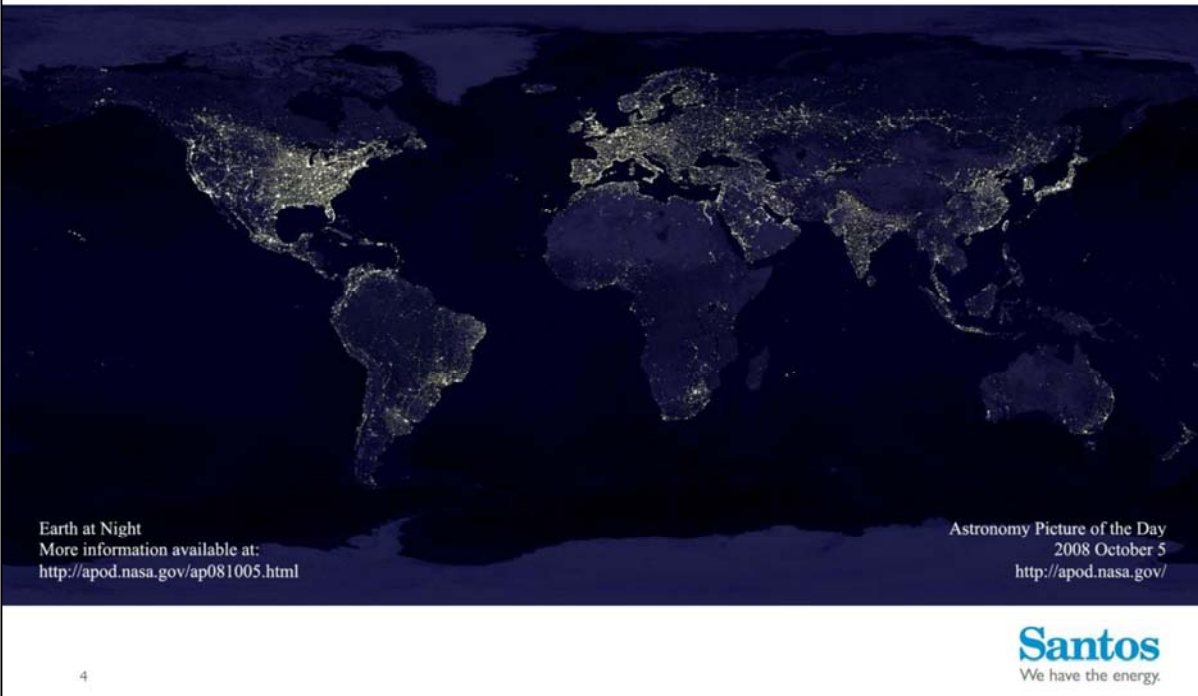
Darwin is also central to the transformation that Santos has undergone in which we have built a strong LNG project portfolio covering different geography, and exposure to different supply sources and technologies.

The Darwin LNG plant at Wickham Point, shown in this slide and operated by ConocoPhillips, was our first venture into LNG. We have an 11.5% stake in Darwin LNG and it continues to make a strong contribution to our production and profit.

On the right-hand side of the slide is the proposed Bonaparte floating LNG project that we're developing with GDF SUEZ, which I'll touch on shortly.

# As global energy demand grows

...energy security becomes increasingly important



So let's start with the energy challenge.

I like this view of the world at night – it clearly shows the energy intensity of densely populated countries. As economies grow and wealth is shared, lights will burn brighter all around the world, and particularly in our neighbourhood – South East Asia.

South East Asia is after all one of the fastest growing economic regions in the world, with many countries achieving impressive growth rates despite the major economic impacts we have seen over the past few years.



# Urbanisation is driving energy demand

Urban migration provides access to power and services increasing the per capital energy consumption



Australia



Bangladesh



Indonesia

0.3  
million  
each  
year

1.4  
million  
each  
year

1.9  
million  
each  
year



= number of people migrating to urban centres each year

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Source: Wood Mackenzie based on 2012 forecasts

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Energy trends are also broadly in line with economic trends – hence the high economic growth rates in South East Asia are being matched with a similarly fast growing energy demand.

The growth in energy demand is driven in part by population growth. Forecasts show that from 2011 to 2035, Asia is expected to account for 52% of global population growth. But this is just part of the story.

The growth is also borne out of literally millions of people across the region seeking a better way of life. By way of example, you can see here the numbers of people migrating to urban centres each year in countries where Santos operates.

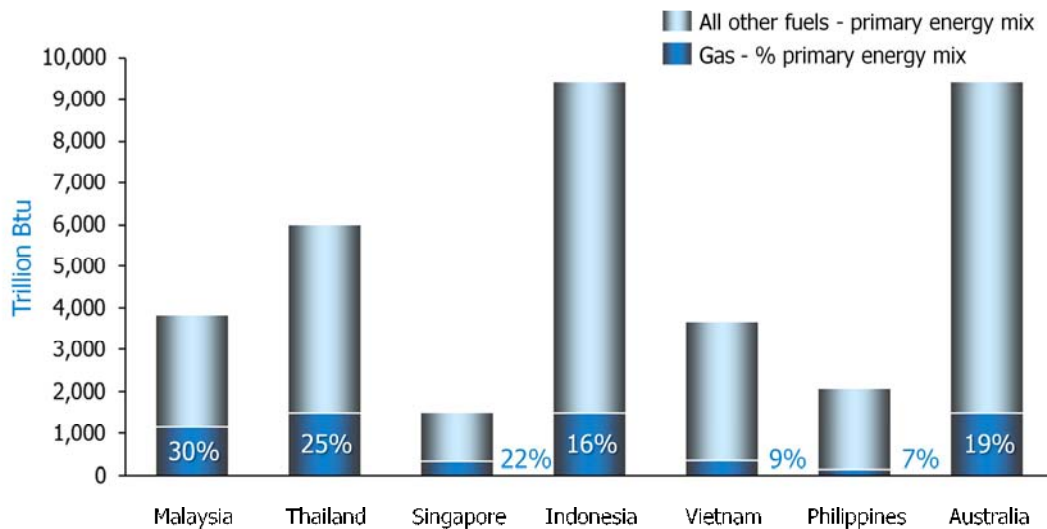
As rural communities migrate to urban centres and cities and have access to gas and power, the demand for televisions, and air conditioners in turn drives a steep increase in the demand for energy.

Indonesia is forecast to almost double its energy intensity through 2030. But even then, Indonesians only consume a fifth of the energy that Australians do.

How this increase in energy demand is met is one of the biggest challenges facing the region. If this challenge is handled well, and if a secure, affordable and sustainable supply of energy is put in place – it can help to transform South East Asia into a stable, prosperous and competitive region – in line with the vision of the Association of South East Asian Nations, or ASEAN, whose aim is to accelerate the economic growth, social progress and cultural development in the region.

# The role of gas in the energy mix

## Significant scope for higher gas penetration throughout South East Asia



6 Source: Wood Mackenzie based on 2011 year

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Let me now move on to the subject of the role of gas in meeting this energy challenge.

It is worth pointing out upfront that while we at Santos firmly support a global transition to a low carbon economy, the reality is that this cannot happen overnight. Over the next 20 years, while supply from renewables will no doubt increase, it is expected that fossil fuels will continue to remain the major source of energy. Indeed, in some countries, such as Japan with its recently announced zero-nuclear strategy, it's likely that the use of fossil fuels will increase significantly and remain high over the long-term.

Gas has an important role to play in this context. It is, after all, a lower carbon alternative – offering less than half the carbon emissions intensity of coal. It is also a natural partner to renewable energy, as gas power plants can quickly be brought on and off when the sun stops shining or the wind is not blowing.

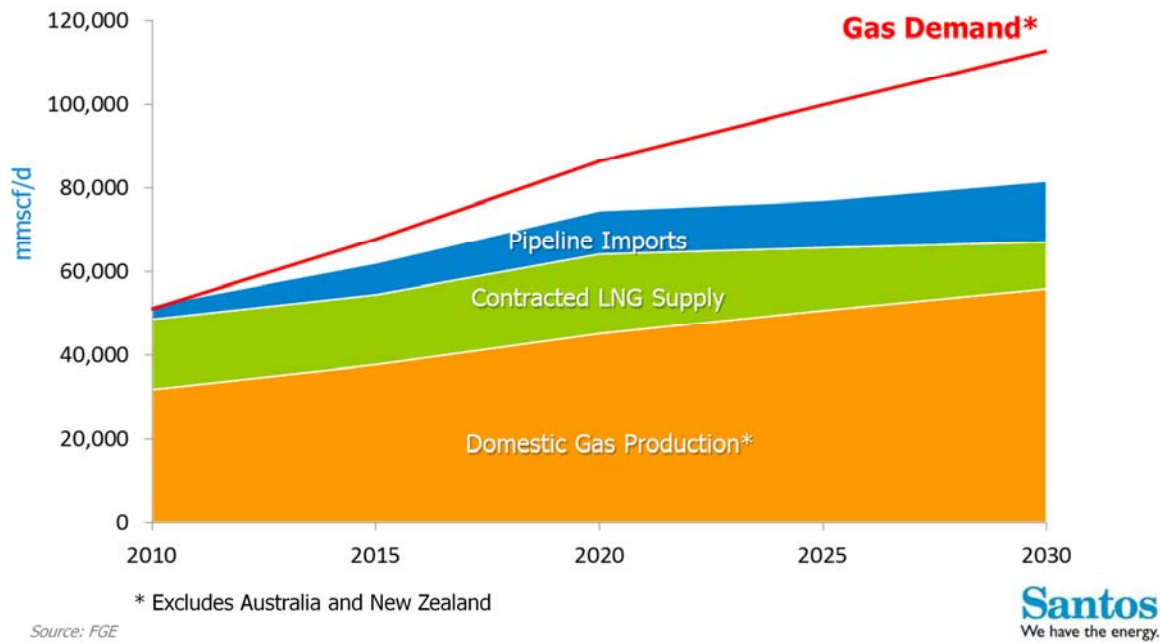
Natural gas is also the cleanest burning fossil fuel – gas-fired power plants greatly reduce emissions of pollutants like sulphur dioxide, nitrogen oxides and particulates. These pollutants are becoming an increasing concern in large urban centres and in some cases are leading to social unrest.

It is this low environmental impact, low carbon advantage, together with the need for diversity of supply that have combined to see expectations for the global use of gas to grow faster than any other fossil fuel in the 25 years to 2035.

Current levels of gas usage across South East Asia and Australia support expectations for increased gas demand growth. The dark blue in this chart shows current gas penetration in the primary energy mix throughout South-East Asia, including Australia, and by extension that there is significant scope for higher penetration.

# The challenge: Asia's energy security

All forms of supply will be required to meet Asia's growing gas demand



This growth in gas sounds good, but it has its implications. Decisions by individual economies to grow their gas content, for diversity of supply and energy security reasons – can have a massive impact on the demand for gas and hence the supply challenge.

A one percentage point increase in gas' share of the fuel mix in non-OECD Asia in 2020 would be equivalent to around 40 million tonnes per annum of LNG if this demand were met entirely by imports. To put this in perspective, Australia currently exports 26 million tonnes per annum or just 70% of this.

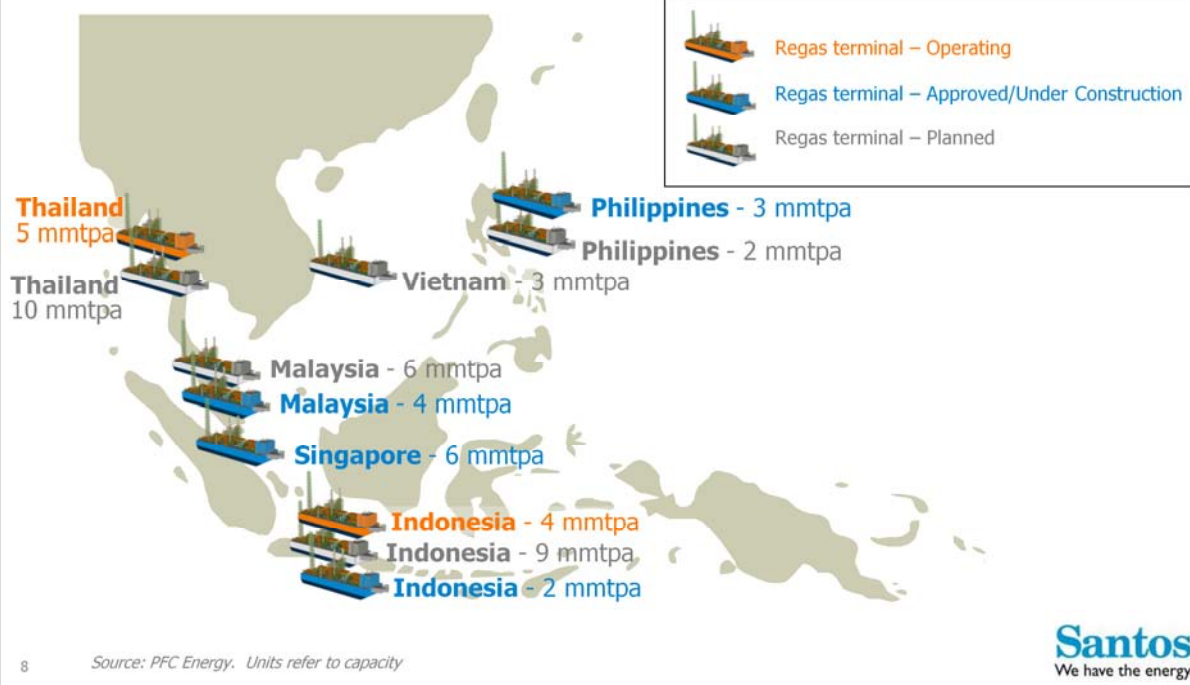
This chart paints this picture more clearly – you can see here that gas demand in Asia is expected to more than double by 2030. And, even including favourable assumptions about government policy changes supporting increased domestic gas production – a gap still exists that needs to be filled.

We expect that the supply to meet that gap will need to come from domestic production, both conventional and unconventional, and pipeline and LNG imports. Additional E&P investment will be required to do this.

Based on International Energy Agency estimates, cumulative E&P investment of 2 trillion dollars is required in the non-OECD Asia upstream segment of the oil and gas sector through 2030. This does not include investments required globally, which the IEA estimates is a staggering \$15.5 trillion between 2011 and 2035, some of which is required to support Asian imports of oil and gas.

## Demand for LNG is increasing from new markets

South East Asia plans to significantly increase its LNG import capacity with 15 mmtpa of import capacity currently approved or under construction



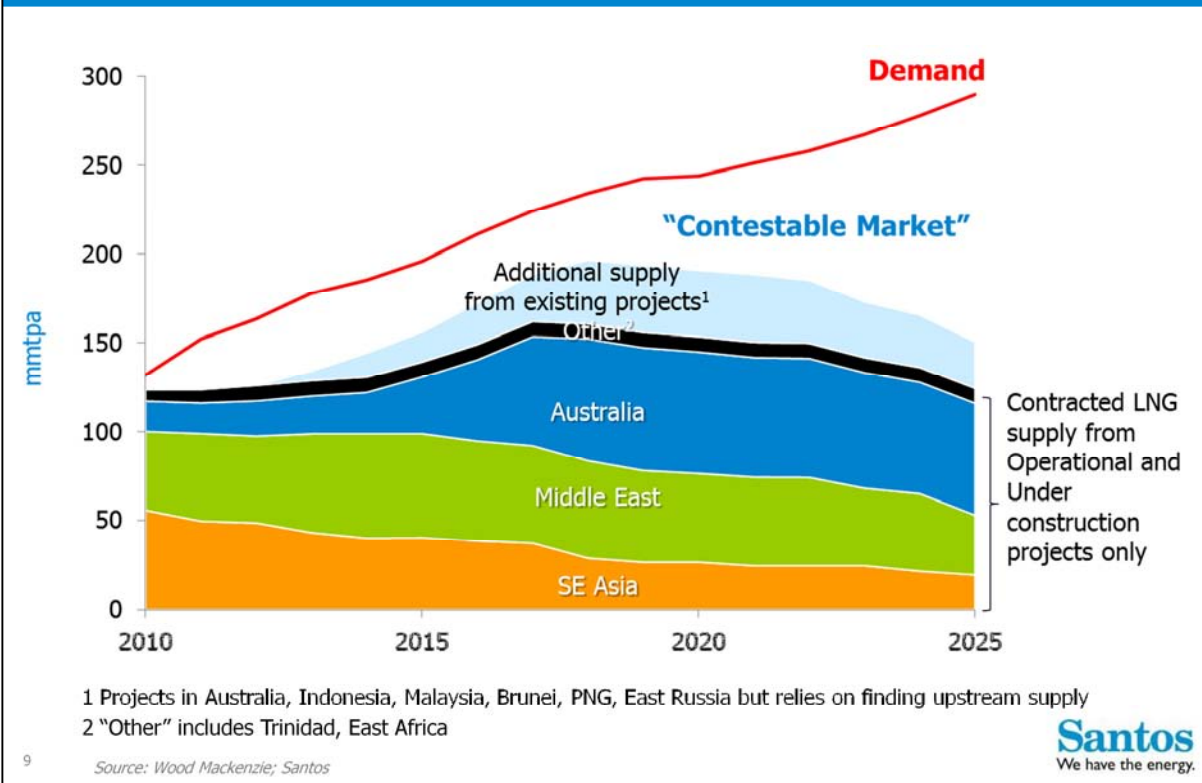
Of course this is already happening.

One area where we are seeing this is in the expansion of the regional LNG market. While South East Asia has been a key region for LNG supply for many years, we now have approximately 15 mmtpa of LNG import capacity, or regas, currently approved or under construction.

Many countries will benefit from the being able to import LNG, including those who were traditional exporters such as Malaysia and Indonesia, as well as new importers such as Thailand and the Philippines.



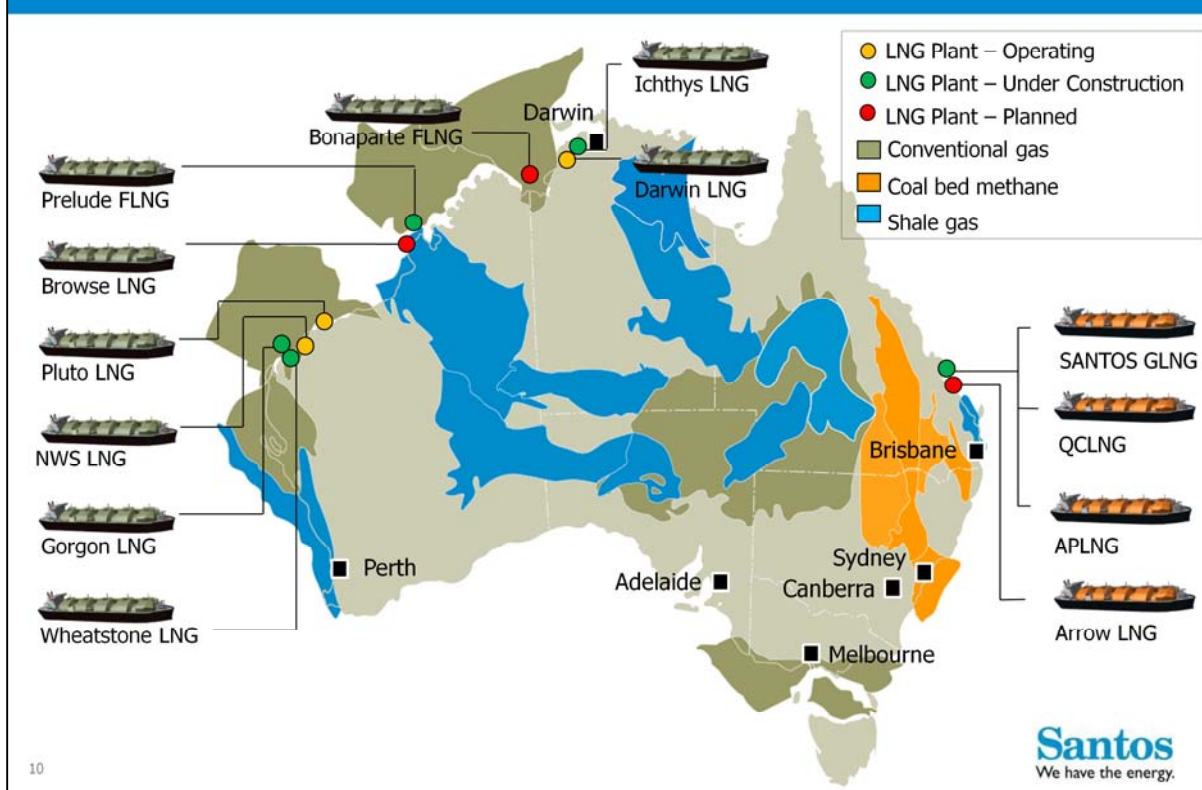
# New sources of LNG will be required



We also expect to see an increase in the diversity of supply sources for LNG. The prize up for grabs is nearly 90 million tonnes per annum of uncontracted demand in 2020.

To date, most of the growth in LNG supply has come from Qatar which still has uncontracted supply, and the current suite of Australian projects. However the emergence of new suppliers including Canada, East Africa and the US – where the production boom in shale gas is driving rapid change in the US energy mix – is good news for Asia.

# Australian LNG: proven supplier to Asia



This is also of course, where Australia's remarkable LNG infrastructure investments come into play. With seven LNG projects worth around \$180 billion currently under construction in Australia's west, north, and east - the oil and gas industry is now a significant generator of wealth for all Australians.

A recent article in the US Oil and Gas Journal pointed out that "no country has ever undertaken construction of so many LNG export projects at one time." All other things being equal, Australia has the gas reserves and resources to support further LNG investment and match Qatar by 2020 to become a leading LNG exporter, at circa 80 million tonnes per annum.

The US EIA also estimates Australia to be the sixth-largest holder of global shale gas resources with approximately 400Tcf of potential recoverable shale gas. What's needed for shale gas to be successful is both the scale and the development of infrastructure to bring that gas to market.

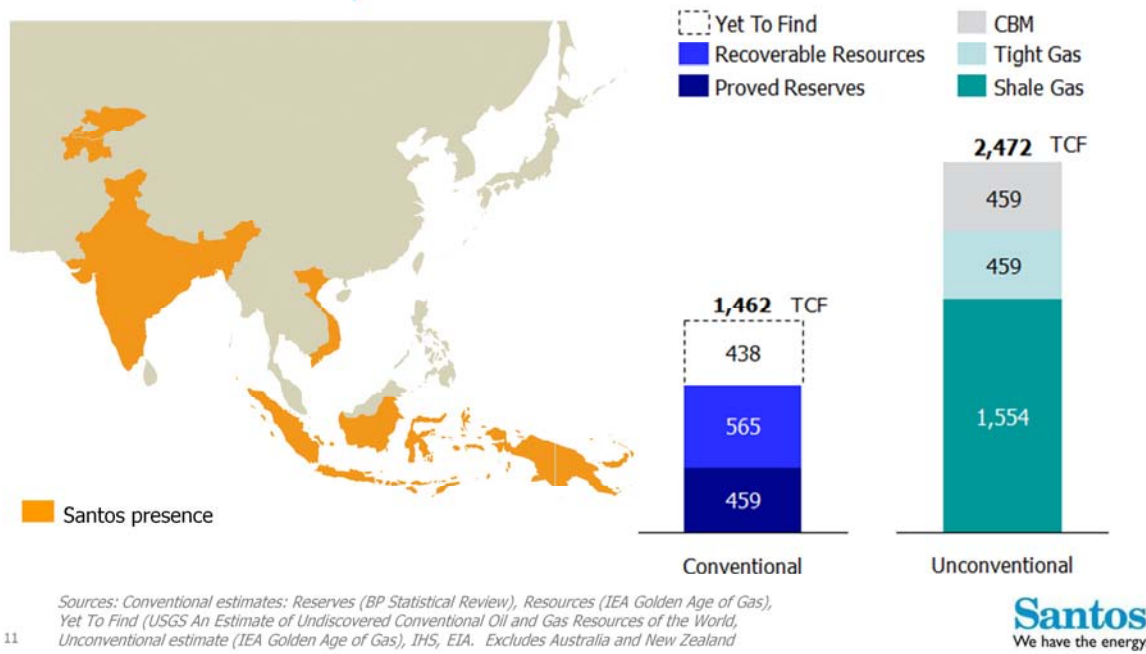
In Santos' own Cooper Basin fields in Central Australia, which have been producing gas for over 40 years, we have recently had some early promising results with our Moomba-191 shale gas well delivering a significant flow of gas to surface to become Australia's first commercially producing shale well.

While it is early days for Australian shale – it is an excellent result particularly because the Cooper Basin has the advantage of existing processing facilities and transportation infrastructure to deliver the gas to east coast markets.

Again, it is Asia that is driving this infrastructure pipeline in Australia, and in particular the ability to secure long-term supply contracts to Asian customers at oil-linked prices.

# Encouraging domestic gas supply

Domestic gas supply from conventional and unconventional sources will be required



Let's get back to Asia. As I said before, to fill the gap between demand and supply additional investment is required to secure future supplies domestically – not just through imports. And, it is my view that significantly more needs to happen on this front.

To strengthen energy security in South-East Asia, countries must do more to encourage investment in domestic exploration and production. This makes good sense – we know the resources are there as you can see on this slide – the challenge is to realise their full potential. Domestic production generally provides the cheapest solution, and unlike imports can provide a national income through profit sharing, tax or royalty regimes – allowing countries to invest in other areas of the economy.

To encourage investment in South East Asia – countries need to recognise that they are competing for global spend in this sector, and hence they will benefit from putting in place the right fiscal, policy and regulatory frameworks. The investment conditions also need to be stable ones as investments can run over 20, 30 or more years and run into the billions.

South-East Asian countries need to encourage investment in both conventional and unconventional sources of gas. In the case of unconventional – and you can see here that their potential is significant – we really are in the early stages of geological understanding in the region. But we do know that unconventional bring their own opportunities and challenges to development, be it their potential impact on communities, the environment, or in managing the production profile of an unconventional resource.

The uncertainties around this can impede investment if not properly addressed. Governments can provide confidence to industry and assurances for the public through early consultation, and the development of a separate regulatory framework.

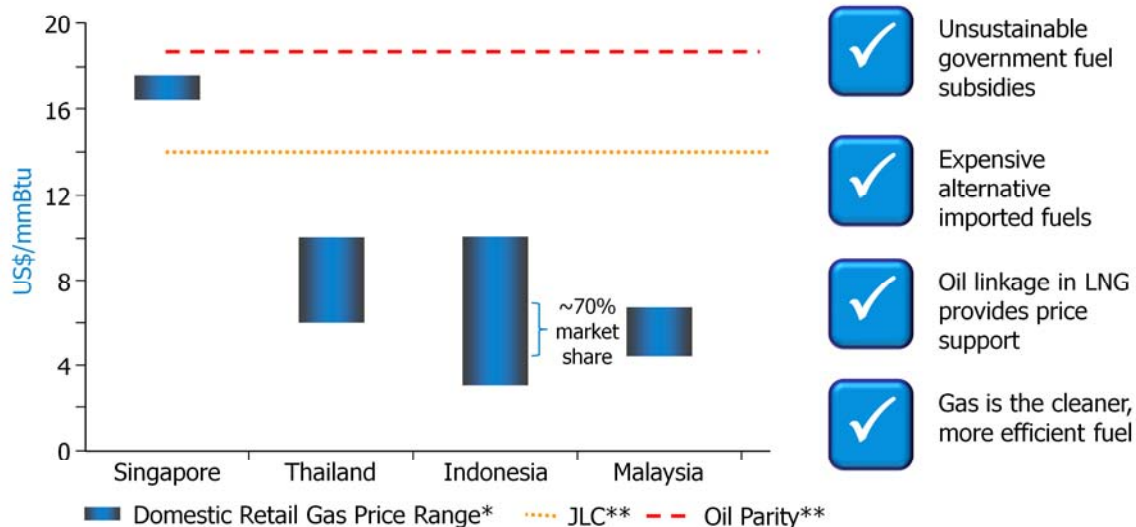
The need for investment certainty around unconventional is not something that is constrained to South East Asia.

It is worth pointing out that the Northern Territory Government estimates the Territory to have nearly 200TCF of shale gas resources. This presents not only another major supply source for export and domestic gas, but promises to deliver significant employment opportunities as well as royalties and taxes.

Here again it is important that government provides the stable and correct policy settings for this opportunity to be taken up. In our view, that means avoiding distortions such as that created by gas reservation policy or forcing a gas price that is below the market price – such interference will scare off potential investors and prevent the development of future supply sources that are needed to meet the projected demand.

# Price signals to encourage investment

Several forces are coming together to create robust domestic gas prices in Asia



\*Range based on retail prices to city gas (residential, commercial and industrial) and power sectors.  
\*\*2011 JLC and JCC levels.

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Source: FGE

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It is important to remember that gas prices have a direct impact on project economics and are key in the decisions of investors.

As this chart shows, domestic gas prices in South-East Asian countries continue to lag behind LNG import prices. But trends are promising, and domestic gas pricing is moving toward import pricing as subsidies are being removed and LNG becomes a larger part of the fuel mix.

In Thailand, pricing is already linked to downstream liquids pricing.

In Malaysia, where government revised up gas prices in June 2011 with a commitment to move towards market pricing.

And, in China there is an ongoing trial to link gas prices to imported LPG and residual fuel oil.

This is good news as encouraging market based pricing is critical to developing the domestic gas supplies required to meet Asia's growing energy needs.

# Santos - a leading energy company in Australia and Asia

## Australia

A leading domestic gas producer for 50 years

## LNG

Delivering a unique portfolio from existing discovered resources

## Asia

Focused growth and exploration-led strategy



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Let's now move from what we at Santos think needs to happen in the region to what we are doing to help contribute to the challenge.

At Santos, we are involved in both LNG supply and domestic production of gas, the two activities critical to the region's energy security.

Today, Santos has a strong portfolio of interests in the region – with established and prospective businesses in six countries, as you can see on the map here. As the Vice President of Santos' Asia-Pacific business, I am now based in our new office in Singapore to oversee our Asia Pacific operations.

However, what surprises many people I meet is that while we are Australia's largest domestic producer of gas, nearly one fifth of our production comes from South-East Asia and a 100% of our contracted LNG is exported there to help meet this growing demand for energy.

To help paint this picture more clearly – I'd like to run you through a few examples of work we are doing in the region that highlight some common factors that have allowed Santos to succeed in delivering gas to our customers.

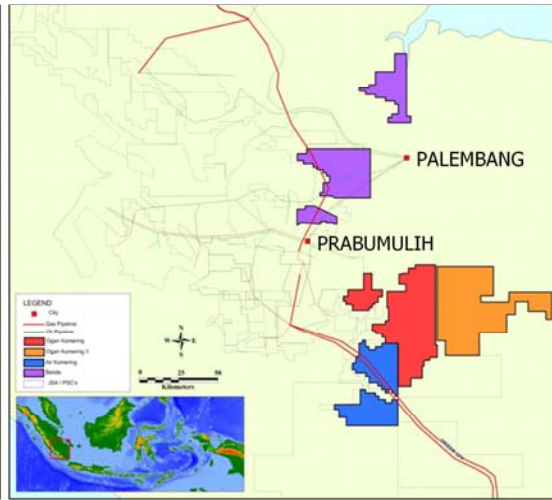


# ① Expertise and technology

Santos' CSG licenses in South Sumatra leverages expertise in Australian CSG technology and operating experience in Indonesia



CSG production well site - Fairview, Queensland



CSG licenses - South Sumatra, Indonesia

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The first example comes from Indonesia, which is a core part of our business with an established office of 170 staff. Indonesia made up about 13% of Santos' total production last year, and is a country in which we are continuing to grow our portfolio of assets.

Last year, Santos signed a farm-in agreement in two CSG licenses in South Sumatra. This partnership leverages both Santos' CSG experience in Australia, and the experience of our local office and our partner Sugico.

This year, Santos extended the partnership with Sugico and added to our South Sumatran position by farming into the Air Komerang and Belida licenses. This early move into highly prospective, greenfield acreage with strong operated equity positions fits particularly well with our business model and has added another facet to our growing Indonesian upstream presence.

Importantly the acreage is close to the existing South Sumatra to West Java pipeline, which already connects to the under-supplied West Java market. We expect drilling to commence before the end of the year allowing early production from CSG to begin to quickly meet domestic demand.

This development schedule demonstrates how building partnerships in Asia with the right levels of expertise can work effectively to deliver increased security of supply.

## ② Local partnerships



Chim Sáo FPSO platform, Vietnam



Bonaparte LNG

Secondly, establishing constructive partnerships with both local and global organisations is an important part of achieving success in the oil and gas business.

A relevant example comes from Vietnam, which has been an important part of Santos' Asian growth strategy since 2006. After much hard work, we commenced production from our first Vietnam oil project, Chim Sáo, in October last year.

All of our activity in Vietnam involves partnering with the national oil company Petrovietnam – the flagship energy company of Vietnam since 1975 – whose position within the economy and the investment environment is important to our success.

Likewise the ability for Petrovietnam to help create the right environment is important for continued exploration progress. The joint venture partners' recent Final Investment Decision to develop the gas resource of Dua is testament to this.

And when it comes to the importance of having good local partnerships in Australia, and of having local expertise and knowledge, Santos is well positioned as an Australian partner of choice. We have been in the Top End for a very long time – in fact, when we were formed, the 'NT' in our name stood for Northern Territory, as in South Australia Northern Territory Oil Search. Today, we're simply Santos.

We have introduced French energy giant GDF SUEZ to the Top End through Bonaparte LNG, the proposed floating LNG project in the Timor Sea that you will hear more about later this morning.

And we are proud of the part we played in June this year in bringing Korea's SK E&S to the Territory through a farm-in into the Caldita/Barossa permits which will see a three-well appraisal program get underway next year.

My message here is: don't underestimate the value and the importance of aligning yourself with a company that has local knowledge and expertise, whether it be a national oil company in Vietnam, or Santos here in Australia.

### ③ Government support



The third example relates to Santos' 13.5% interest in the 6.6 million tonne per annum, two-train LNG project in PNG, operated by ExxonMobil.

Government ownership in the project has been a key success factor from the outset. The PNG Government's understanding of the project's deliverables and challenges has helped ensure that all aspects of the design would benefit the community and leave a lasting legacy for PNG. The revenue from the project is in fact expected to double the gross domestic product of PNG.

The Joint Venture Partners have also worked closely with the PNG Government to create beneficial sharing agreements for project impacted landowners. These agreements are not simply financial benefits, but include jobs, business development as well as community investment.



# New established office in Singapore



I hope I have told a clear story of the energy challenges and opportunities facing Australia and South-East Asia.

The challenge is not insurmountable, but is one in which industry and governments both have a role to play.

We at Santos recognise the importance of the region and welcome the dialogue, support and partnerships with governments both in Australia and across South-East Asia as we seek to help deliver a sustainable supply of energy to power the region's future.

Thank you.