# Submission to Senate Rural and Regional Affairs and Transport Committee Inquiry into Australia's Future Oil Supply

## BP Australia Pty Ltd

### Introduction

(a) BP plc

BP Australia Pty Ltd is a wholly owned subsidiary of BP plc which is a major international energy explorer, producer and marketer. BP plc has major global interests both in hydrocarbons and in developing alternatives and renewable energy.

While BP plc believes that traditional hydrocarbons will continue to play a major energy role for many years, the company recognizes the need to look to alternatives, and has taken major steps accordingly.

Major steps in this regard have been:-

- The swing to more low carbon production eg natural gas and LNG, with lower greenhouse emissions. These have been largely for stationary power uses (eg power stations)
- Developments in photovoltaic energy (solar energy)
- The creation of BPAlternative Energy which will manage an investment programme in solar, wind, hydrogen and combined-cycle-gas-turbine (CCGT) power generation, which could amount to US$8 billion over the next ten years.(Attachment 1)

(b) BP Australia

BP Australia Pty Ltd is a major oil refiner and petroleum products marketer in Australia. BP is also Australia's leading PV solar manufacturer. Particular aspects of BP's business relevant to this inquiry are:-

- BP operates two refineries – at Kwinana in Perth and Bulwer in Brisbane
- BP produces, imports and markets roughly 25% of our liquid fuel requirements
- BP markets product across Australia
- BP has led the way on producing clean petrol and diesel in Australia
- Almost all of the crude oil for the refineries is imported.

### a. projections of oil production and demand in Australia and globally and the implications for availability and pricing of transport fuels in Australia;

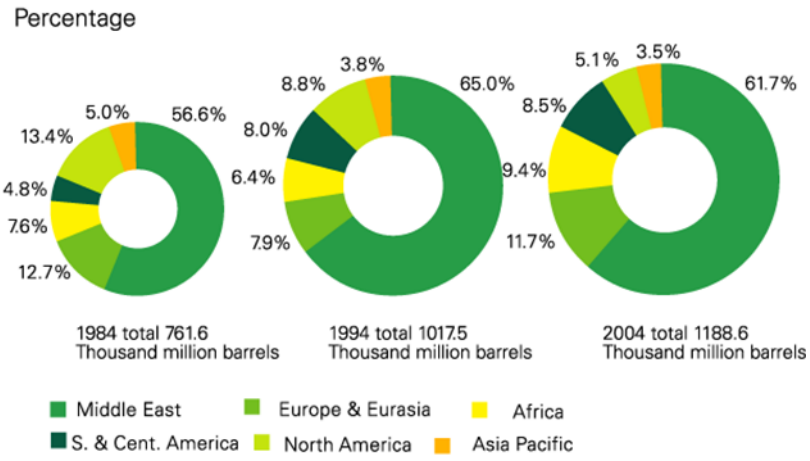
Apart from its one sixth interest in the NW Shelf (which is primarily a liquefied natural gas operation), BP produces no hydrocarbons in Australia and we have no supply projections for hydrocarbon production in Australia. We believe that Australia remains a

prospective area, especially in terms of gas. Australian petroleum products demand is about 45 billion litres pa and is growing at around 2% pa.

Globally, the following charts (mostly sourced from BP's 2005 Energy Statistical Review) show:-

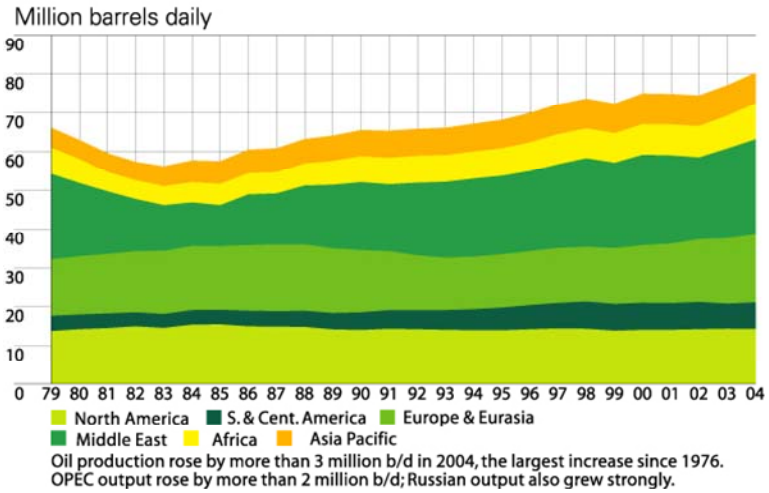
- world reserves of oil have increased from 771.6 thousand million barrels in 1984, to 1017 thousand million barrels in 1994, to 1187 thousand million barrels in 2004

## Distribution of proved (oil) reserves 1984,1994, 2004




- world production has increased from 67 million barrels per day (bpd) in 1994 to 77 million bpd in 2004 (consumption has followed a similar trend)

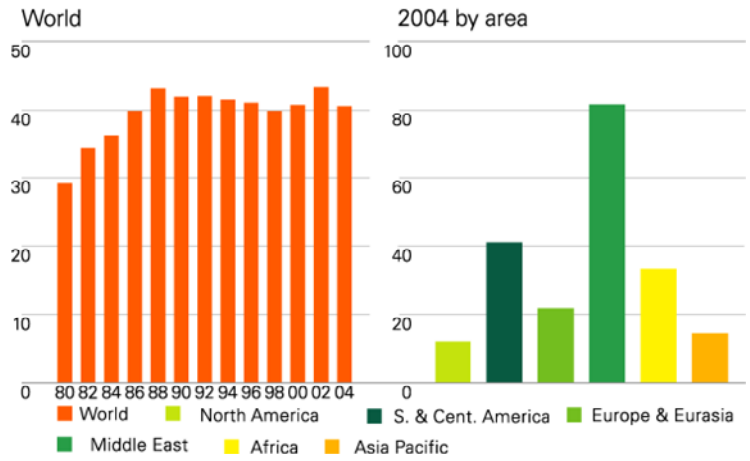
## Oil production by area



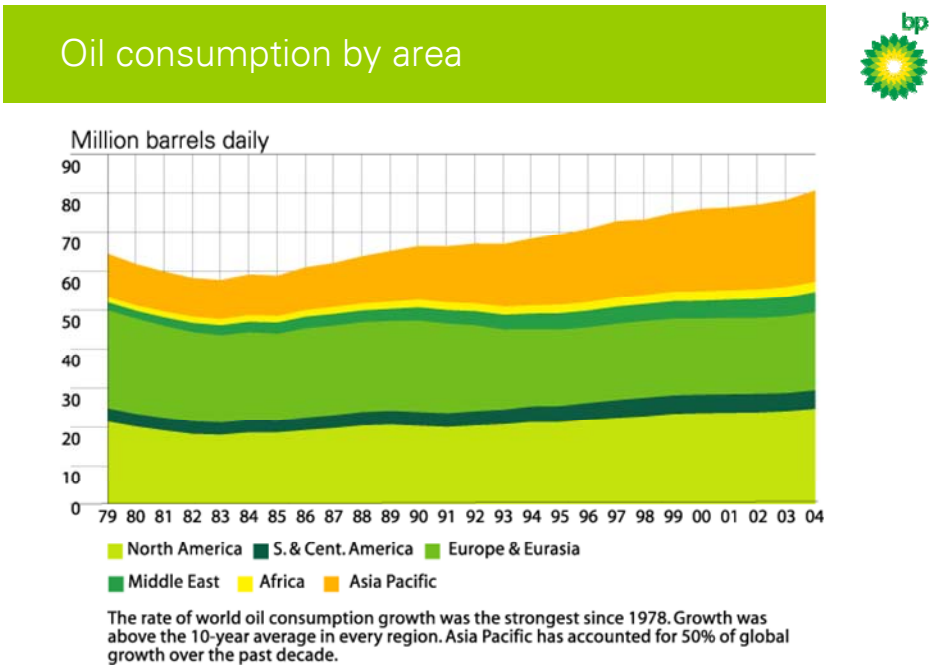

Oil production rose by more than 3 million b/d in 2004, the largest increase since 1976. OPEC output rose by more than 2 million b/d; Russian output also grew strongly.

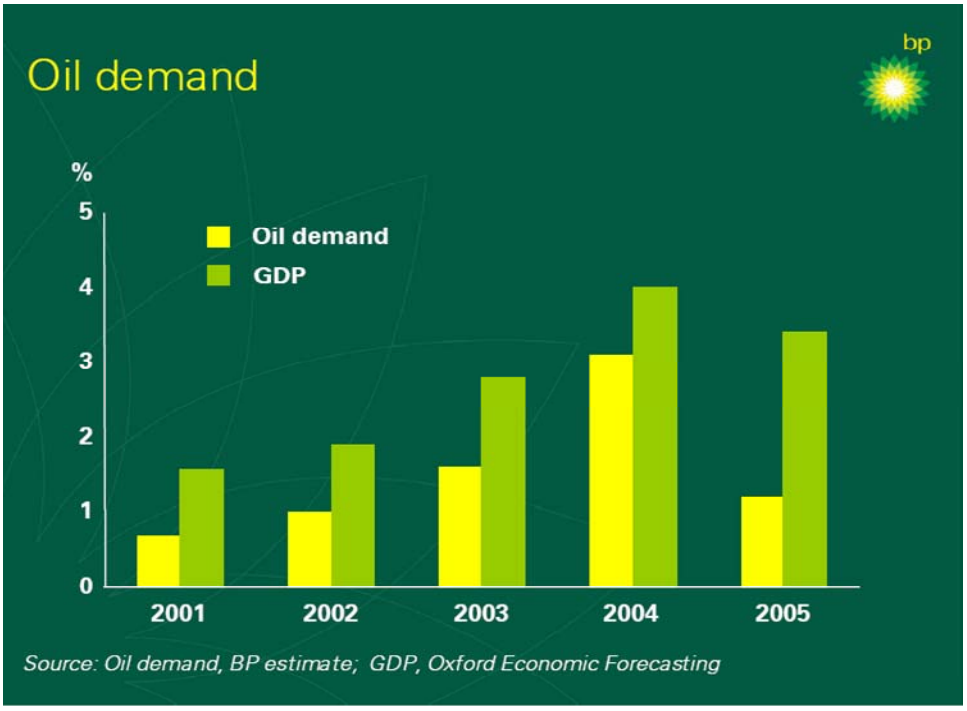
- reserves to production ratio has increased from 30 to about 40 (i.e. 40 years known reserves at current production rates) since 1986.

## Oil reserves-to-production (R/P) ratios

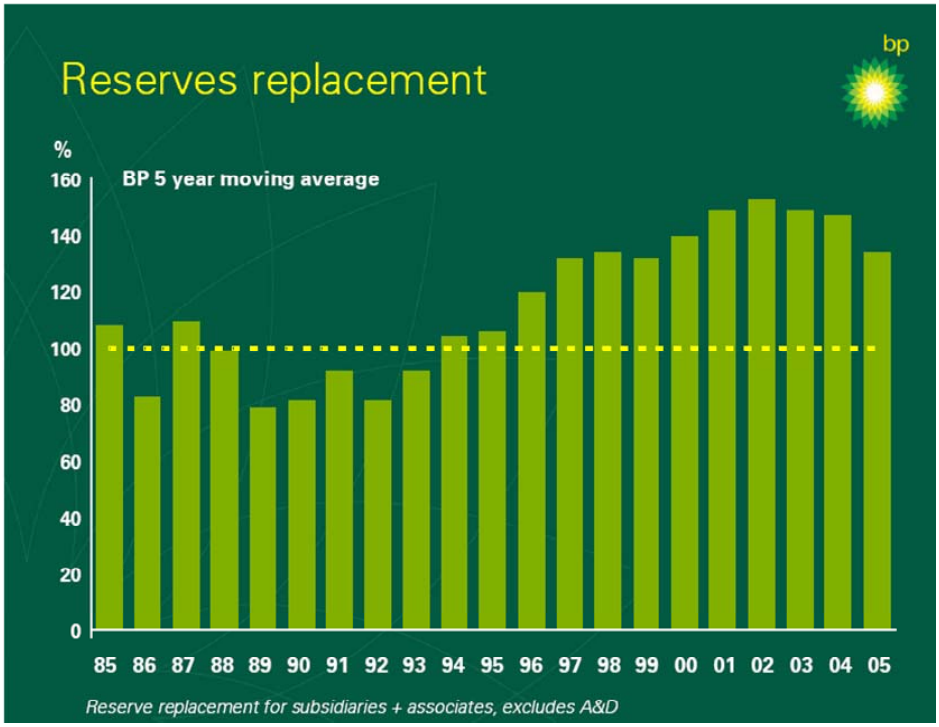



The world's oil reserves-to-production ratio fell to 40.5 years in 2004, down from 43.3 in 2002. Reserves have continued to increase and now stand 17% above the 1994 level; production is 20% higher.




As far as BP is concerned, 2005 was the 13th consecutive year that we have replaced 100% or more of our production.




To quote Lord Browne, CEO of BP plc in a recent speech: "(There is a) myth, which is that oil and gas are running out, and that we are walking towards the edge of the cliff……

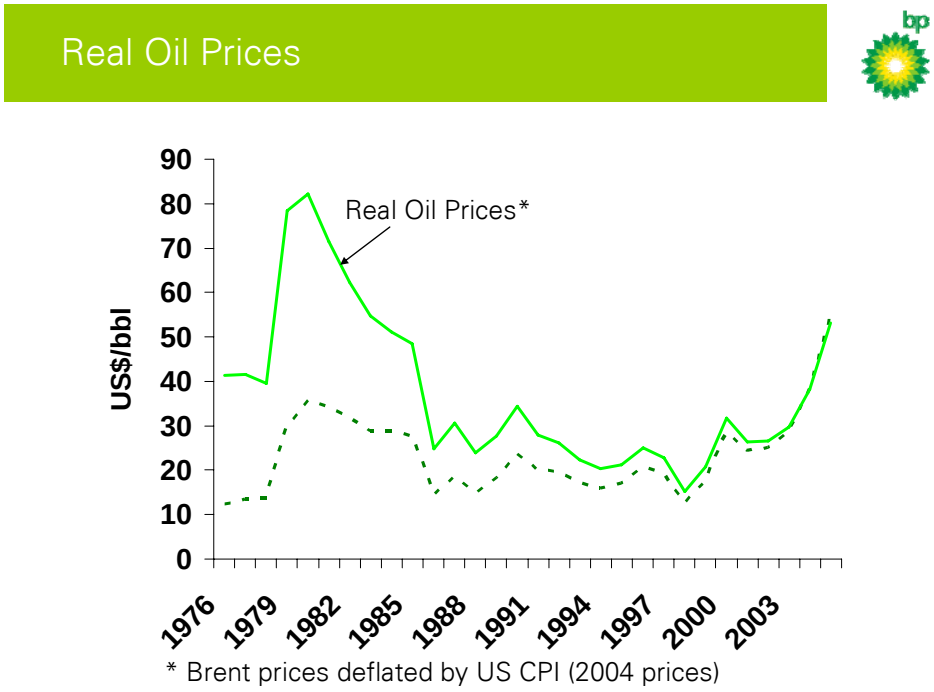
The idea that oil is running out is simply untrue. There is no physical shortage of oil or gas.

The reality is that the physical resource base is strong, and the amount which we can recover from that base is being expanded by technology all the time.

BP believes there is no direct issue about availability. Oil – whether crude or product – is a mature internationally traded commodity. BP has imported virtually all of its crude over the past 20 years, and we cannot recall any major issue of availability during this period.

**Implications for pricing of transport fuels in Australia**

Australia is already inextricably linked to world and regional product prices for both crude and petroleum products. This is the more so given that Australia now has to import products. However, there is a presumption in the terms of reference that prices will increase. While there were major increases in prices in 2005, this does not mean that this trend will continue. The following graph shows how prices declined in the early 80s and were basically stable for much of the 90s.




Price is a matter of the market and supply and demand, stockholdings and supply capacity. It can also be influenced by other factors – world events, terrorism, hurricanes etc.

As for the future of prices, it is very difficult for anyone to predict these. In a recent speech, our Group Chief Economist forecast a band of US$50-60 for this year for Brent crude.

**b. potential of new sources of oil and alternative transport fuels to meet a significant share of Australia's fuel demands, taking into account technological developments and environmental and economic costs;**

BP believes:-

- Traditional hydrocarbons will continue as the mainstay for transport fuels
- Biofuels represent a very useful extender. BP has just made a major announcement in this regard.

Attached is a press release of 31 March 2006 announcing two major contracts and a Memorandum of Understanding in respect of biofuels.

We will elaborate on these matters at the hearings.

**c. flow-on economic and social impacts in Australia from continuing rises in the price of transport fuel and potential reductions in oil supply; and**

This assumes that there will be continuing rises in the price of transport fuel and potential reductions in oil supply.

This is not necessarily the case. It is very hard to be definite on these matters as the preceding graph shows in respect of price.

**d. options for reducing Australia's transport fuel demands.**

There are a number of options here, including:-

- increased vehicle fuel effciency
- greater use of public transport.

These could be discussed further at the hearing.

Attachment 1

# BP forms BP Alternative Energy – 28 November 2005

BP today announced that it plans to double its investment in alternative and renewable energies to create a new low-carbon power business with the growth potential to deliver revenues of around $6 billion a year within the next decade.

Building on the success of BP Solar - which expects to hit revenues of $1 billion in 2008 - BP Alternative Energy will manage an investment programme in solar, wind, hydrogen and combined-cycle-gas-turbine (CCGT) power generation, which could amount to $8 billion over the next ten years.

"Consistent with our strategy, we are determined to add to the choice of available energies for a world concerned about the environment, and we believe we can do so in a way that will yield robust returns," said BP chief executive Lord Browne.

"Our recent experience, particularly with solar, has given us the expertise and confidence to develop new products and markets alongside our mainstream business. We are now at a point where we have sufficient new technologies and sound commercial opportunities within our reach to build a significant and sustainable business in alternative and renewable energy."

Browne said the first phase of investment would total some $1.8 billion over the next three years, spread in broadly equal proportions between solar, wind, hydrogen and CCGT power generation. Investment will be made step by step, and will depend on the nature of opportunities and their profitability.

"We are focusing our investment in alternatives and renewables on power generation because it accounts for over 40 per cent of man-made greenhouse gas emissions, the biggest single source. It is also the area where technology can be applied most cost-effectively to reduce emissions.

"As the pricing of carbon develops through trading schemes and other initiatives, the market will grow rapidly as low-emission technologies displace less clean forms of power generation."

Investment in solar over the next three years is planned to boost BP's leading position as a leading manufacturer and supplier of photovoltaic systems. In a field where technology improvements and higher productivity are causing costs to decline, BP currently has 10 per cent of the global market which is growing at 30 per cent a year, faster than any other form of renewable energy.

BP currently has more than 100 megawatts of solar manufacturing capacity in the US, Spain, India and Australia, with a plan to double its capacity before the end of next year. BP recently signed a strategic joint venture to access China's expanding solar market and provide local manufacturing capacity and is exploring similar opportunities elsewhere in the region.

Investment in hydrogen fuels will include the world's first commercial project - at Peterhead, in Scotland - to turn natural gas into hydrogen by stripping out carbon dioxide and pumping it into depleted oil reservoirs.

The hydrogen will be used at a power station in Peterhead to generate 350 megawatts of 'clean' electricity, and the carbon dioxide re-injected into the offshore Miller field. BP is looking at a similar sequestration scheme to make hydrogen from low-value coke by-products at a US refinery which would be used to generate 500 megawatts at an adjacent new-build power plant.

Investment projected for wind represents a significant step up in this area of power generation for BP. The company currently runs two wind farms alongside existing oil plants in the Netherlands. It also owns industrial land in open, high-wind regions of the US, away from residential areas, providing the possibility to build the first large-scale US wind farm generating up to 200 megawatts in 2007. The company has identified enough US sites to accommodate wind turbines with a total capacity of 2,000 megawatts.

Projected investment in CCGT will be spent mainly in the US where the company already has significant co-generation capacity and is currently finalising plans for a new $400 million scheme at one of its major plants that will deliver 100 megawatts of power to the plant, and 420 megawatts to the local electricity grid.

BP Alternative Energy will be based in Sunbury, Middlesex and initially employ some 2,500 people around the world. It will be headed by Steve Westwell, reporting to Vivienne Cox, chief executive of BP's Gas, Power & Renewables division.

# press release

31ST MARCH 2006

## *BP brings biofuels into the mainstream*

BP Australia today announced it has signed two contracts and a Memorandum of Understanding to provide to consumers over 200 million litres of biofuels per annum by 2008. The announcement signals the early delivery by a single company of over half of the Federal Government's national target of 350 million litres.

BP President, Mr Gerry Hueston said "BP will invest in refining and distribution infrastructure and secure product to enable biofuels to play a role in the future of Australia's petroleum supplies. This announcement is the culmination of many years of work by BP and demonstrates our ability to deliver cleaner fuels to Australian motorists."

"In delivering these initiatives we would like to acknowledge the support of the Federal and State Governments," said Mr Hueston. "This work signals a unique change to the composition of Australia's fuel supply and is evidence that much progress is being made towards the Federal Government's biofuels target."

The initiatives include:-

- Investment to allow production at BP's Bulwer Refinery in Queensland of 110 million litres per annum of biodiesel through a new technology, with the fuel being made available to the market from 2007. The biomass feedstock has been secured through a contract for supply of tallow from Colyer Fehr Tallow Pty Ltd.
- A Memorandum of Understanding with Primary Energy Pty Ltd to purchase the entire output from a new ethanol plant to be constructed by Primary Energy in Kwinana, Western Australia. This would see the production of 80 million litres of ethanol per annum to be sold across Australia as e10 from 2008.

- A contract for purchase of 23 million litres of ethanol from CSR over 2 years. The ethanol will be purchased from CSR's Sarina distillery near Mackay and blended to produce e10 that will be sold into the Queensland market later this year.

"BP believes biofuels have an important role to play in strengthening Australia's security of supply," said Mr Hueston. "However, the role of sound policy settings cannot be underestimated. The Government's Energy White Paper and introduction of legislation for petroleum market reform are steps that will result in far greater confidence in investing in the future marketing and distribution of these products.

ENDS

For any media inquiries please contact:
Chandran Vigneswaran on 03 9268 3534 or 0410 479 002

**Notes to editors:**

Biodiesel derived from hydrogenation of tallow

- At its Bulwer Refinery, BP will produce approximately 2 billion litres of diesel per annum containing a 5% component of biodiesel derived from tallow using new technology.
- BP will use a new, internally-developed technology which allows tallow to be converted to biodiesel using hydrogen.
- The Bulwer Refinery is particularly well suited to this technology.
- The biomass-feed, which will initially be tallow, will be sourced from Colyer Fehr Tallow Pty Ltd and other local sources.
- The fuel from the Bulwer Refinery will be made available to all current suppliers and will meet the relevant Australian specifications for conventional diesel, providing an equivalent level of performance to users.

Ethanol and e10

- The e10 fuel blended in Western Australia will be sold at BP's sites in Perth and to other suppliers in Perth and across Australia from 2008.
- The ethanol produced at the new plant in Kwinana will use approximately 200,000 tonnes of Australian wheat as a feedstock. WA currently exports approximately six million tonnes of wheat.
- The Kwinana plant will also generate renewable electricity from biomass as an integral part of its process. Together, the renewable fuel and renewable electricity will result in a reduction in greenhouse gases to the order of 200,000 tonnes per annum.
- BP e10 delivers a similar engine performance to that of traditional petrol, with the added benefit of lower emissions.
- e10 fuel is not new for BP; in fact, BP commenced marketing e10 in Queensland in 2001. Fuel ethanol blends have been successfully marketed by BP in the United States under the Amoco and ARCO brands since the mid 1980s.
- BP has now sold more than 20 million litres of e10 in Australia without recording a single vehicle complaint.
- An updated list of BP locations at which motorists can purchase e10 is available online at www.bp.com.au.

General

- Biomass typically refers to plant materials and animal waste used as a source of fuel Examples include tallow, sugarcane, corn, wheat, sorghum, beets, vegetable oils, wood and straw.
- BP Australia is at the forefront of companies working to significantly improve the environment through the introduction of clean fuels.
- BP has a global commitment to deliver cleaner fuels and already offers low sulphur and low benzene products in over 130 cities worldwide.

# *Energy Security – Trends, Challenges and Solutions*
# Gerry Hueston, President BP Australasia

**May 3rd 2006**
**Australian British Chamber of Commerce – Business Lunch**
**The Park Hyatt, Melbourne, Victoria**

Ladies and Gentleman,

Thank you, I am delighted to be here. In fact, I think that this is going to be one of the highlights of my day. I started the day after delivering my daughter to school and, then got held up on the Monash Freeway. If that wasn't bad enough, I then arrived in the office and my PA said to me "Happy Anniversary". I said, "What's that for?", and she said "Its thirty years for you at BP today." What she was too polite to say, but I suspect probably thought, was that when I started at BP she was in pre-school.

The other unfortunate thing of course is the timing of this event. You agree to do these sorts of presentations well in advance and, of course what you can't predict is what happens to the price of oil in the interim. The price of oil spiked in Perth last year when I made a speech, and people attending the event were not particularly interested in what I had to say unless it was in relation to the price of oil. Of course, today we have the price of oil now at a record high.

Today I do want to talk to you about the trends and the challenges of energy security. However I will make a couple of comments to satisfy people upfront about the price of oil. I say that because I won't satisfy people. I can give you some warning of that in advance.

I make two points. The first point is that I have no idea what the price of oil will be. If that's not enough, anyone who says that they do - and that's the second point – they will be wrong.

There is absolutely no logic in where oil is today. The day to day oil price is driven by events and, very current events. There is a lot of fear in the market at the moment. There is a lot of speculation. Because we have got a very tight market it is very difficult to calibrate what is going to happen. In BP, our view is that the intrinsic value of oil is exaggerated at the moment as a result of the way the market is. In the medium to longer term the value of oil will be a lot lower than it is today.

There has been 600 billion dollars invested by oil companies over the last few years into increased production. I can assure you that none of that has been predicated on 70 dollars plus oil. Its been predicated on a lot lower than that.

I don't know when the medium term starts. I'm not going to make any predictions. I'm not going to make any predictions about the price of oil. But it is inflated by fear, speculation and a very, very tight situation overseas today.

I would now like to move on to the challenges for energy security. In doing so let's just think about Australia for the moment. Australia enjoys a very high level of energy security. I am sure that we can all think of an incident where energy hasn't been supplied to the level that it has been expected to. However, I think that the energy industry in general has done a remarkable job of making sure that energy, and low cost energy at that, has been supplied to a sparsely populated large land over many, many years.

In Australia, we do have an abundance of energy resources. We have got a lot of coal and a lot of gas. There has also been a lot of press recently about the fact that we have got a lot of uranium. We don't have as much crude oil, but we have got a reasonable amount of crude oil.

We have also got a level of infrastructure that meets today's needs. It's questionable however whether this infrastructure can meet tomorrow's needs. I think that point is particularly important, because at the moment we are a growing economy and we are predicted to grow significantly in the future. We spend about 60 billion dollars a year on energy. That level is expected to increase by about 50% by the year 2020. So, you can see we are going to need a substantial amount of investment to make sure that the infrastructure we look after today is looked after tomorrow.

There has been a lot of good work done in the area of Australia's infrastructure needs. The Business Council of Australia has done tremendous work in this area and has had the agenda largely taken up by COAG. There has also been a lot of activity going on in the electricity sector.

On the oil and oil products side there certainly needs to be considerable more investment in infrastructure. I'll give you some examples. About four years ago, Australia was long on refining capacity. With increases in demand, the total amount of refineries are now short. While we imported no cargos of refined product a few years ago, last year we imported over 100 cargos. By 2010 it's going to be 300 cargos, and it just escalates from there.

When you reach a tipping point, the infrastructure required for importing cargos of fuel are quite different to the infrastructure you need for importing crude oil. So you can see that even fairly dramatic changes are happening in our industry.

Of course the specifications have also changed. Rightfully, this has been a result of changing expectations from the Australian public, the government and us I might say. We must move in line with global specifications to make sure that the fuel that we have is the best available for the public. That means that we have had to invest significant amounts in our refineries, and that has meant that they are potentially more susceptible than they have been in the past. There are a lot of things that can conspire to mean that we have a number of challenges ahead of us.

I think the interesting thing for us is that just because we own refineries in Australia, we are discriminated against on how we go to market by existing legislation. I will talk about policy a bit later on, however the Federal Government is to be applauded for introducing legislation that effectively will reduce that ridiculous anomaly that allows providers of infrastructure to be discriminated against.

That's a little bit about Australia, but energy security is really a global issue. I don't think we can sit back here and say, well we're actually not badly placed and we can look after ourselves. Australia is essentially a trading nation. The world is a trading operation. The solution is therefore not to secure a price for ourselves and rely on our own resources.

Energy security is also a long term issue. The question many people ask is when is oil going to run out? when is gas going to run out? when is coal going to run out? It could be said that William Knox D'Arcy, the person who founded BP, saw the beginning of the oil age as we know it. Maybe today we are seeing the end of the oil age as we know it.

But the oil age is not going to end tomorrow. More pointedly, we don't believe its going to end in the near future. We believe that while energy supplies are finite, there is still a long way to run. For example over the last 20 years we have managed to ensure that there is always 40 years of oil supplies left to meet today's demand. In other words, we have managed to not only replace our production every year, but we have managed to increase it to meet the increase in demand. With increases in technology, in terms of where you find the oil and what you can extract, we believe that this trend will continue. We don't see oil running out in the immediate future and we don't subscribe to the peak oil view that it's doomed tomorrow and it's going to run out. We also

don't see that these short term market aberrations are any indicator of long term value or shortages or otherwise of oil. Moving beyond oil, there is also sufficient evidence that suggest that gas has got 60 years and coal has more than 150 years.

I mentioned the short term price of oil, and it is easy to understand why people are vexed about it. There is an incredibly tight market out there. The rapid rise in demand from China and the lack of investment in the late 90s have both worked to produce the tight market we have today. With the high crude oil prices, some people are reading into that perhaps a bit more than they should do. We do have heavy dependence on politically sensitive parts of the world such as the Middle East, and as the Europeans recently discovered with gas in Russia. Some exporting nations are pretty unstable. Venezuela would be a case in point. On top of all this we also have the fears about peak oil – are we going to run out of the stuff.

We don't believe that people need to be in despair about it. We believe there are good grounds to be optimistic about the future. But we need to face some realities. One of those is that short term events have dictated the terms about security. But one thing I can assure you is that short term fixes are not going to mean a long term solution. And energy security is a long term issue.

Growth in demand for energy is going to continue. Whether we like it or not, we can't roll it back. It is also unrealistic to think that we can constrain the growth in prosperity in developing countries, (and energy is the lifeblood to growth in prosperity) any more than you think you could actually wind back prosperity in Australia.

Another reality is that if you think that supply is relatively concentrated today, the all we need to do is look ten years down the track where we will see that 80% of the additional production or growth in supply is going to come from just three areas of the world – West Africa, Russia and the Middle East, with the predominance from the Middle East. I don't have to describe the potential implications of that when it comes to energy security.

The other item that has brought energy security up to be a mainstream issue around the world is the issue of climate change. The impact of fossil fuels on the environment may well be a bigger issue in the long term than the provision of the product in the first place. BP has a very public view on climate change. We believe that while the science is incomplete and always will be, as a company with views on taking risks and rewards, we think that there is sufficient evidence out there to suggest that precautionary action should be taken.

Recently, BP carried out some research and published a report in conjunction with five other major Australian companies and the ACF. The report looks at evidence that suggests that the impact on Australia could be particularly dramatic in an environmental and an economic sense. This research also suggests that the costs of early action may not actually be that high.

Globally BP is advocating a very broad based set of precautionary actions that will allow the world to try and stabilise $CO_2$ emissions and, try to maintain the global increase in temperature to an acceptable level. Recent actions, such as government initiatives with AP6 that includes the major emitting Asia Pacific economies, is a great step in the right direction.

Climate change is an issue that is going to impact on energy security as we go forward. The solution is not to going to be that we can't use energy, but that we have to find ways to use energy that are more sustainable than we do today.

So how do we respond to the big realities that I have described? We believe that there are some real challenges out there, but we don't believe it's impossible. One of the key elements may be an increase in the diversity of supply. We don't want to be held hostage to a select few parts of the world where supply will come from. We need more diversity in the products that we are using. And, we need diversity in technology. As you can see there is not one silver bullet that is going to

solve the energy security issues that we will face in the future, or in fact any of the issues that are emerging as a result of the release of carbon into the atmosphere.

We do believe that we need that energy needs to have a far lower carbon footprint in the future. We also don't want to tradeoff economic wellbeing for security of supply. In order to achieve this we need to be thinking about the long term now, and not waiting for a crisis to occur. I know some people have declared today a crisis with the price of oil. We don't think it is. But we do need to be thinking long term. And this is not simply thinking five years ahead. This is thinking about a horizon closer to 2020 and beyond.

The sorts of things that we need to be thinking about for the long term include infrastructure. We all know that power stations have a life cycle that goes well beyond 50 years. So do oil refineries. Technology research and development has a long term horizon. Policy settings also need to be such that they encourage things to happen. As a result, government and business both have a role to play. We believe that if you have a combination of the right policy settings, the right investment in technology and the right investment in infrastructure into the longer term, plus an open and competitive local and global market – then you have got all the ingredients needed to maintaining our prosperity in a sustainable way into the future.

If we think about technology as an example. Apparently a lot of the alternatives are seen as long horizon, and not yet proven in an economic sense. However let's look at solar for example. It's not currently economic to produce baseload electricity from solar. But if you look at solar on the rooftops in the Western suburbs of Sydney fuelling air-conditioning systems at 4 o'clock in the afternoon, then solar is economic against electricity. These are the sorts of examples that we need to make sure we have the right policy settings to enable. We must make sure that we have level playing fields in the future, with policy settings that drive these things. It's not about government picking winners; it's about government making sure that there is the right environment for ultimately the market to pick the most optimal winners in the future.

Good policy is policy that encourages sustainability, policy that encourages the right investment in technology, policy that encourages the right investment in infrastructure, and ultimately allows the market to pick the winners.

It's also about cleaning up local and international markets. It is important that markets work freely as they are working relatively well today to make sure that supplies can come in. When we think about the disruptions that have occurred over the years, the market has worked. The market has worked today, its worked in the past, and we believe it could be allowed to work in the future.

In terms of policy options it is also important that energy options that have the potential to have a material impact are enabled. I have talked about solar and photovoltaics in peak demand. I mentioned before some curious regulation that if you are a refiner and importer you have one set of rules and if you don't refine then you have another set of rules. Those are the sort of things that need to be wiped away if you want to have the right sort of investment in the future.

Now I would like to talk about what BP is doing. Perhaps on this topic it's best to start of with where we are coming from philosophically. We start with the view that the purpose of business is to satisfy human needs and in so doing make a profit for investors. For BP that means providing energy so that we can fuel human progress and economic growth. But it also means satisfying a need for a sustainable environment. BP doesn't have a future unless the products it sells are sustainable. That sets the background as to why BP is doing what it does in a global sense.

More practically our approach at BP is two fold – Firstly, we are spending a lot of money delivering increases in supplies of our traditional fuels to meet energy demands of today. And secondly we are investing in technology that will allow a low carbon energy of the future.

If we think about investing in supplies, I said earlier that over the last few years the industry has invested over $600 billion in bringing new developments into the market place. This means that there is a huge amount of investment going on today that will meet the supply shortages that we are facing tomorrow.

BP is in places like Azerbaijan, Gulf of Mexico, Trinidad and Angola. We have gone into deeper waters. We have gone into arctic and colder climates. And, we have opened up markets that have been closed for 80 odd years such as the BTC pipeline out of Azerbaijan into Europe.

Of course in Australia we are a participant in the North West Shelf Project which if you go back one year and go forward two years, it will have tripled in size. We are looking very seriously at the Browse basin which is another potential LNG project into the future, and we have invested well over half a billion dollars in our refineries and our terminals to make sure that we can meet the demand of the Australian consumer into the foreseeable future.

We are also investing heavily in technology. In 1997 BP came out quite categorically and said that there was sufficient evidence to take precautionary action on climate change. Since then we have been doing a lot of work to clean up our own backyard as well. For example, our direct emissions from our operations have decreased from 95 million tones in 1998 to 78 million tones in 2005. Some great examples in Australia include up at Karratha where we've led a 400,000 tonne emission reduction with new solvent technology. We have also invested in cogeneration at our refineries, delivering another 100,000 tonne reduction. We have introduced a scheme whereby consumers can completely offset their greenhouse emissions by paying a price premium on the cost of their fuel.

We established a company called Alternative Energy late last year that is heavily focused on the power sector. It is focused on decarbonised fuels, solar and wind. Over the next few years we intend to invest approximately $8 billion in the development and deployment of those technologies.

Looking at one example: We have two projects that are being developed as we speak that are going to take a fossil fuel and convert it into $CO_2$ and Hydrogen. The project will then put the hydrogen into a power station to generate electricity and the $CO_2$ will be sequestered to remove any carbon from going into the atmosphere. So effectively, these are power stations with a zero carbon footprint. These are what we call scale demonstration plants, that as we move forward we would expect to become part of the norm around the world.

As part of Alternative Energy we have the biggest solar manufacturing facility in the southern hemisphere based in Sydney. We are also the biggest exporter of renewable energy that Australia has.

While only 20% of energy demand is in transportation, there is also lot of work going on in this sector as well. Cleaner fuels need to be developed that are intrinsically more efficient and have a lower carbon footprint as well. On this ground we are working on biofuels and we recently announced a few projects that will see BP effectively meet more than half the national target for biofuels by 2010. That's just BP by itself. And in the longer term for biofuels we are doing a lot of research and have established pilot plants globally to take this fuel to the next step. Second generation biofuels are where you start to turn plant waste like cellulose into ethanol and you are not actually impinging on the food chain.

So there is a lot happening, and I suppose I have presented you with a bit of a potpourri of what is going on. But obviously there is a lot more to do. Energy security is a global issue, and Australia acting by itself shows leadership, but is not the ultimate solution. There is no simple silver bullet. But the climate and the world's resources are something that we all share. I think that global cooperation is necessary. And government and businesses cooperating with the right policy settings are going to play a key role.

Ultimately diversity – diversity of supply sources, diversity of products and diversity of technology are going to be some of the key enablers supported by the right policy frameworks. Along with that we need to make sure we have the appropriate investment and infrastructure, and that we have the right policy settings to make sure that trade is as good as possible.

From BP's perspective it feels like a challenge. One of the reasons I have stuck with BP is that it's always a challenge, and I mean that in a positive sense. We do look forward to being pat of the answer. I think it's an exciting time to be involved. After all providing energy and energy security is part of our business.

Thank you