



## The Case for the Australian Coal-to-Liquids Industry

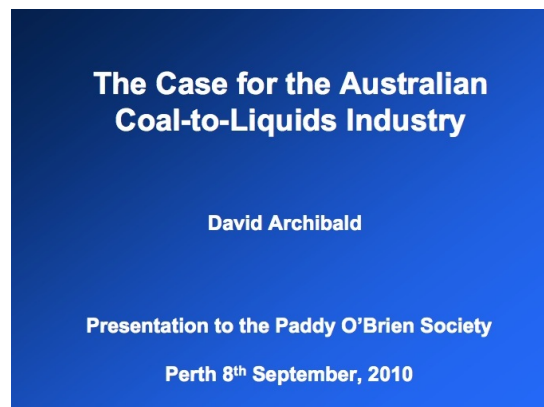
Posted by [Gail the Actuary](#) on September 30, 2010 - 9:22am

Topic: [Alternative energy](#)

Tags: [coal](#), [coal-to-liquids](#) [[list all tags](#)]

This is a guest post by David Archibald, of Perth Australia. He has a degree in geology from Queensland University, and has worked in a number of fields, including oil exploration. He also makes a hobby of studying climate change. (I have removed the climate change slides from this presentation, however.)

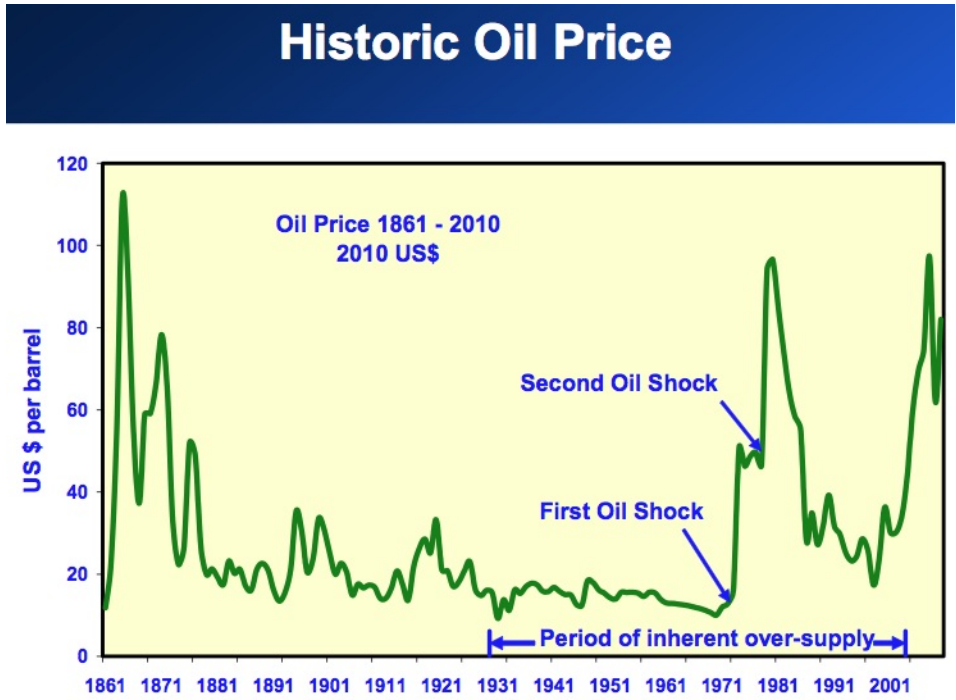
Below the fold is a presentation he made regarding why he thinks Australia should consider coal to liquids technology. It can also be found on the website of the [Australia Coal-to-Liquids Association](#), or directly, at this [link](#).



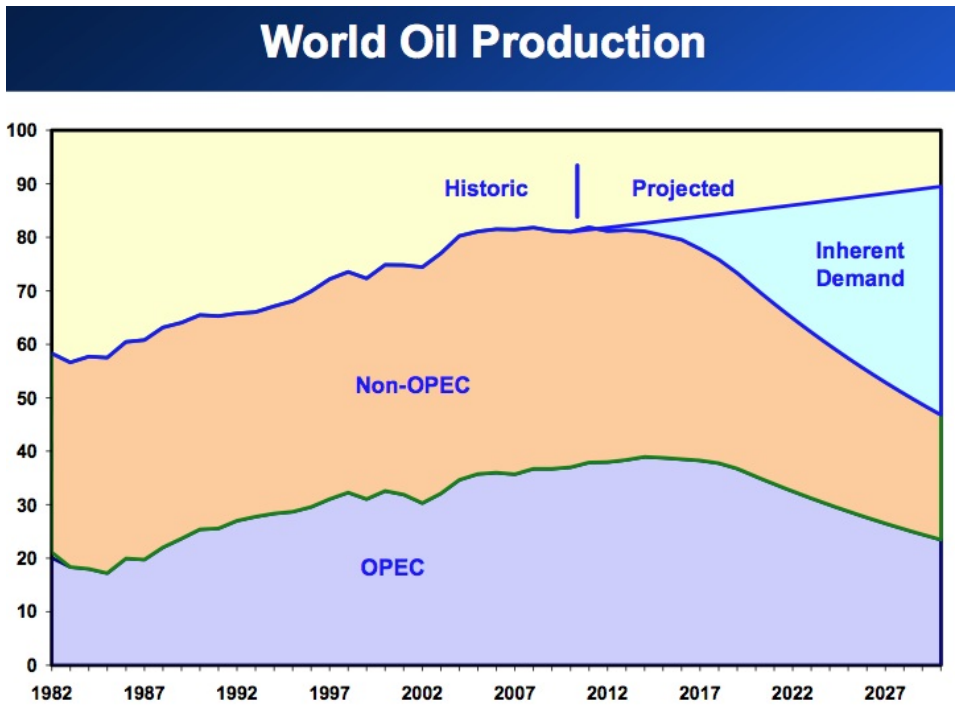
**“One day we will run out of oil; it is not today or tomorrow, but one day we will run out of oil and we have to leave oil before oil leaves us, and we have to prepare ourselves for that day.”**

**Fatih Birol, Chief Economist of the International Energy Agency**

Slide 2

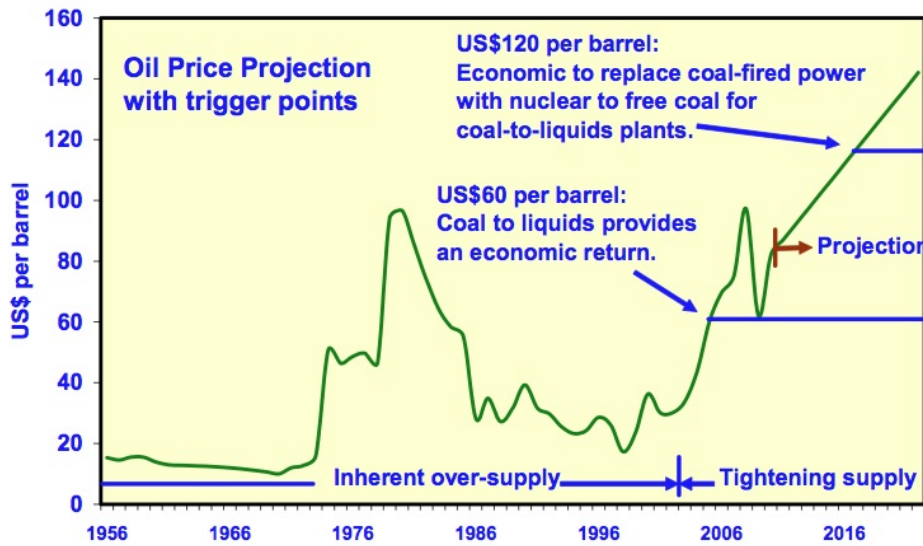


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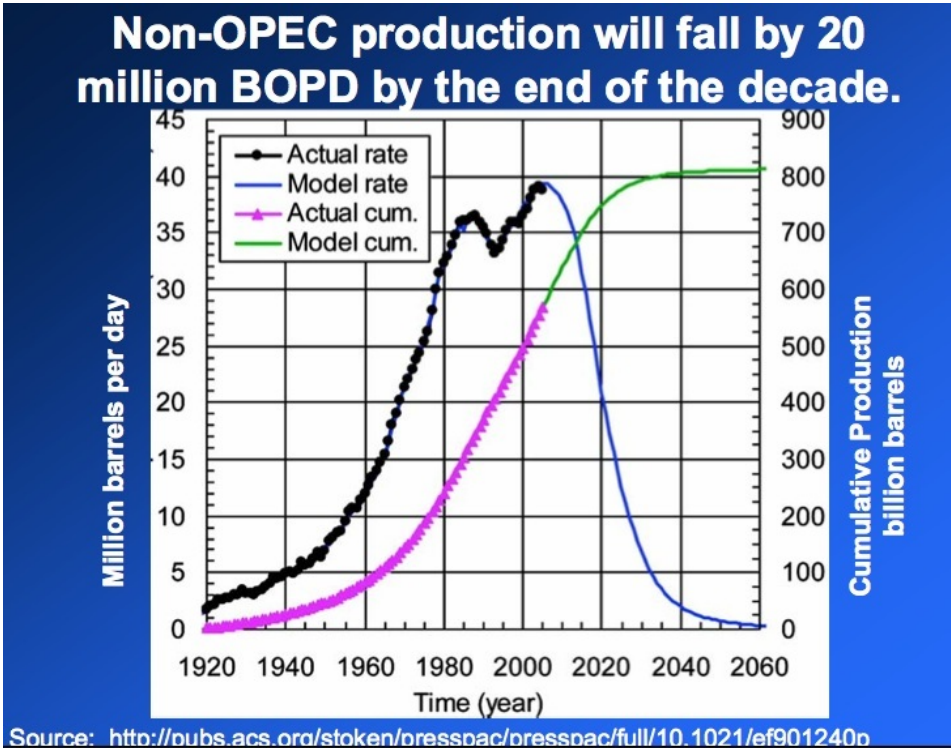


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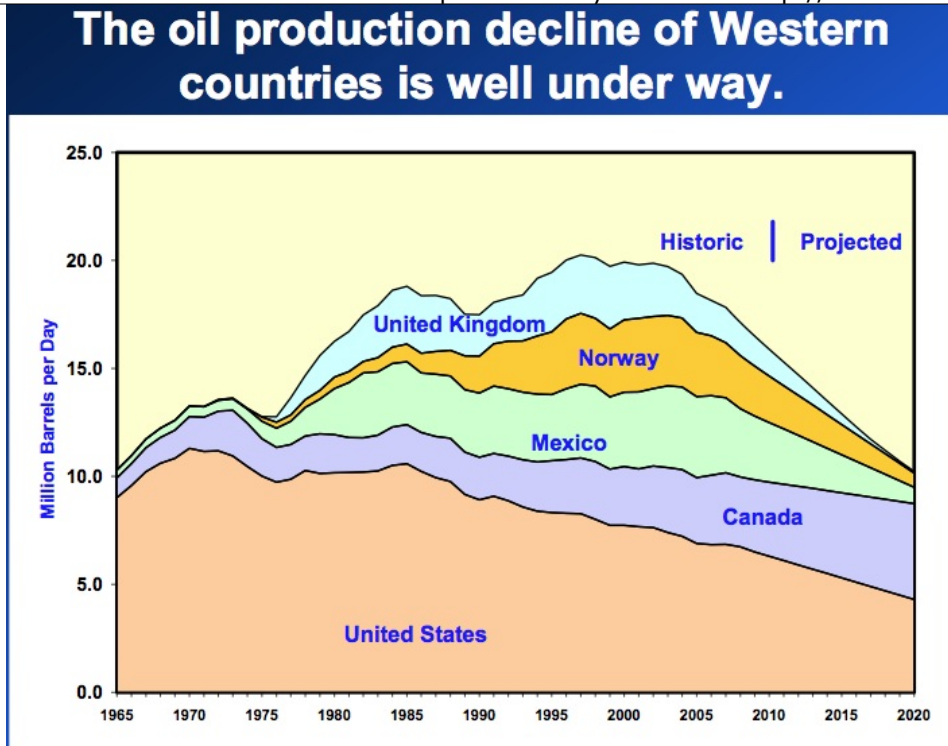
## The oil price will drive nuclear plant building.



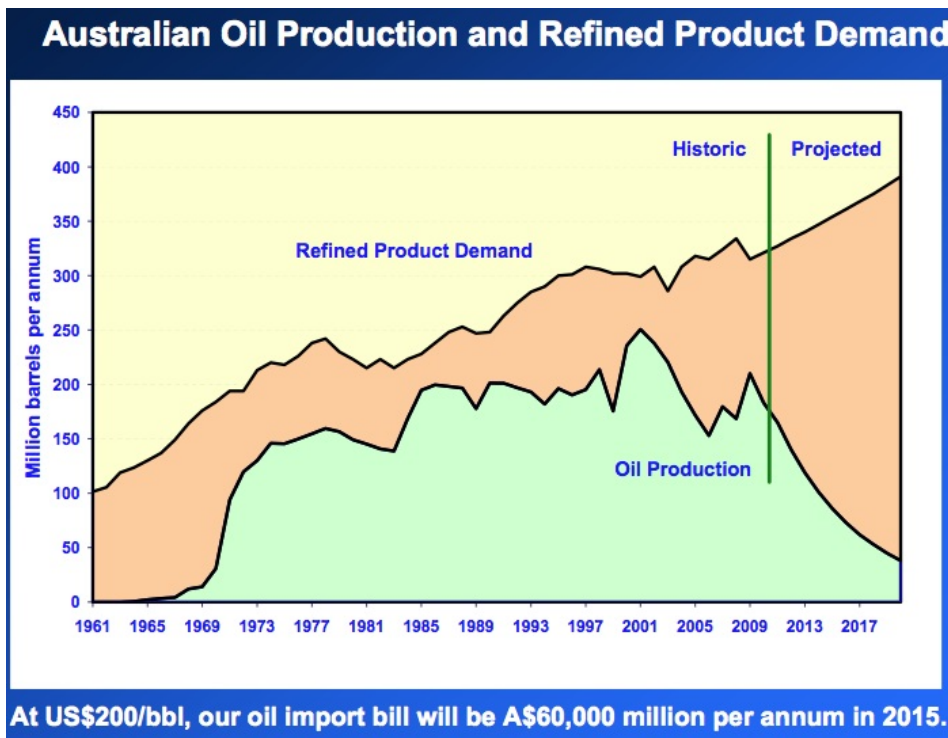
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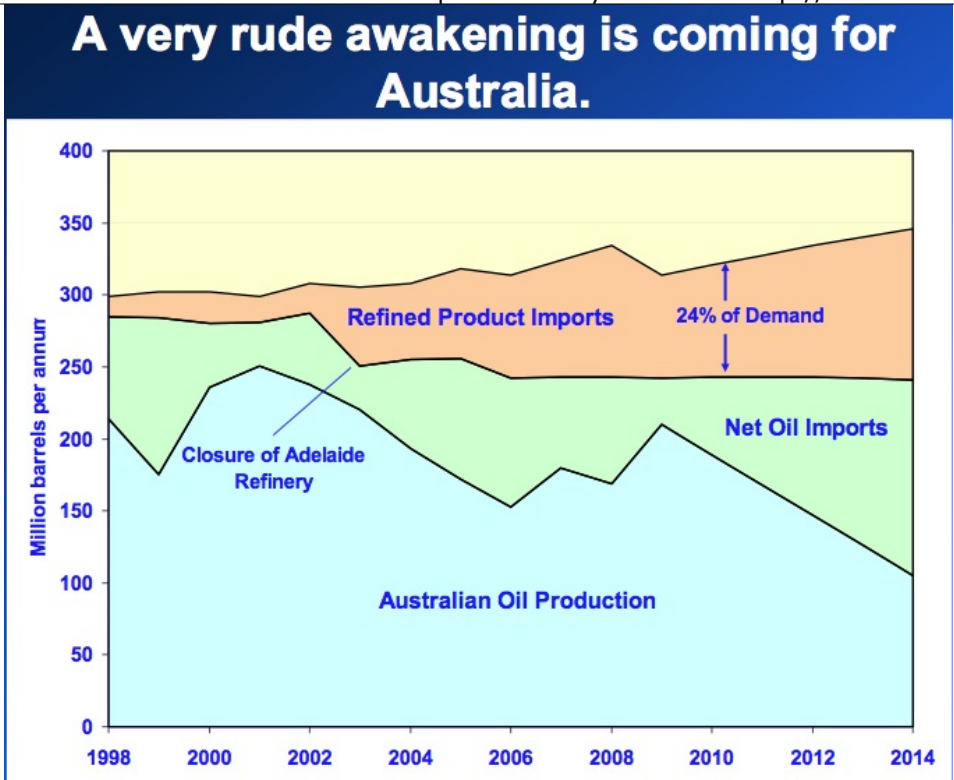
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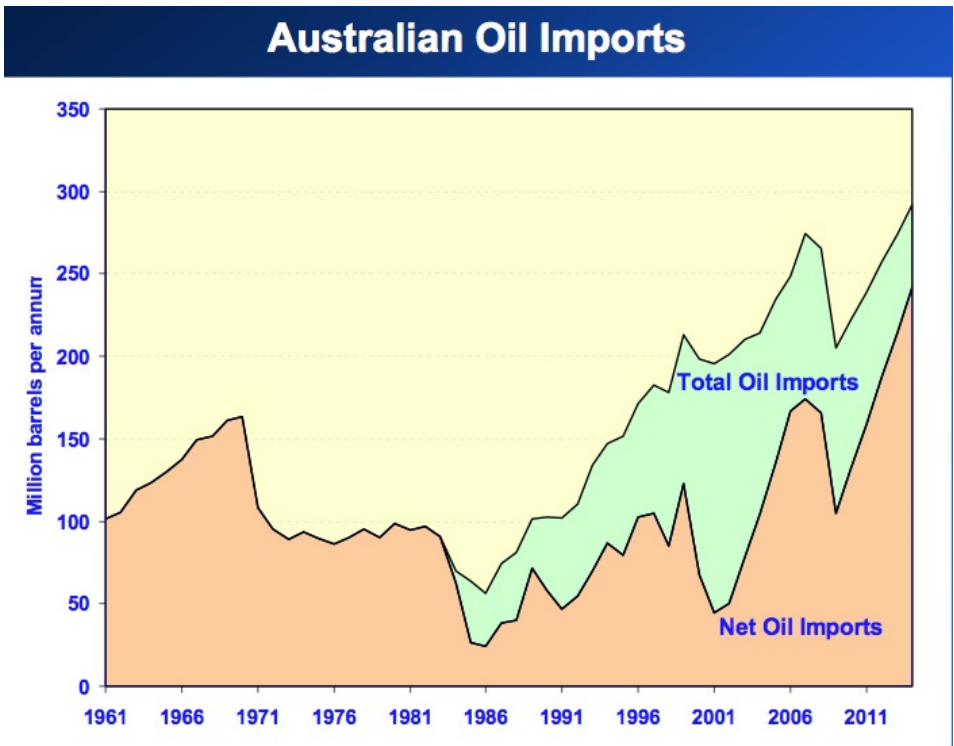
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Slide 9



Slide 10

## Two Problems

- 1. After four decades of being largely self sufficient in liquid fuels, Australia is now becoming highly exposed to potential supply disruption, with potentially catastrophic consequences for the economy and national security.**
- 2. The trade deficit is going to balloon out.**

*Slide 11*

## Binary Outcome

**Either:**

**Australia continues as is with potential for enormous economic disruption from supply squeezes and a ballooning trade deficit.**

**Or:**

**Australia installs Coal-To-Liquids capacity, insulates itself from supply disruptions and generates a large amount of company tax in the process.**

*Slide 12*

## Solution: Coal to Liquids

- **The breakeven price for CTL projects is about \$50 per barrel.**
- **Modelling of a 50,000 bopd plant has the following results at US\$100/bbl:**

<b>Capital Cost:</b>	<b>\$4,200 million</b>
<b>NPV at 10% discount rate:</b>	<b>\$8,850 million</b>
<b>IRR:</b>	<b>25%</b>
- **US\$100/bbl is A\$0.77 per litre pre taxes.**

*Slide 13*

## The Virtues of Coal-to-Liquids

1. **CTL will make Australia impervious to oil supply disruptions.**
2. **CTL will stop an enormous blow out in the trade deficit.**
3. **The capital cost per annual barrel of capacity at about A\$300/barrel will be less than twice the oil price.**
4. **Backing out 800,000 BOPD of imports by 2015 at US\$200/barrel will result in \$17 billion of company tax being paid.**

*Slide 14*

## Australian CTL Potential

- **The Latrobe Valley has 50 billion tonnes of lignite – this could make 33 billion barrels of diesel and refinery feedstock.**
- **We have billions of tonnes of lignite in a belt stretching from Esperance in WA to east of Adelaide.**
- **Distributed diesel production would contribute to fuel supply security.**
- **The Fischer-Tropsch process can operate at very high ash levels.**

*Slide 15*

## Great Plains Synfuels Plant North Dakota



**Annual consumption is 6 million tonnes of lignite to produce 54 billion cubic feet of synthetic natural gas.**

**It could be making diesel.**

*Slide 16*

## CTL is no more expensive than deep water oil

Coal to Liquids has operating costs and capital costs per barrel, over the life of the project, are similar to that of current deepwater oil and LNG projects around the world:

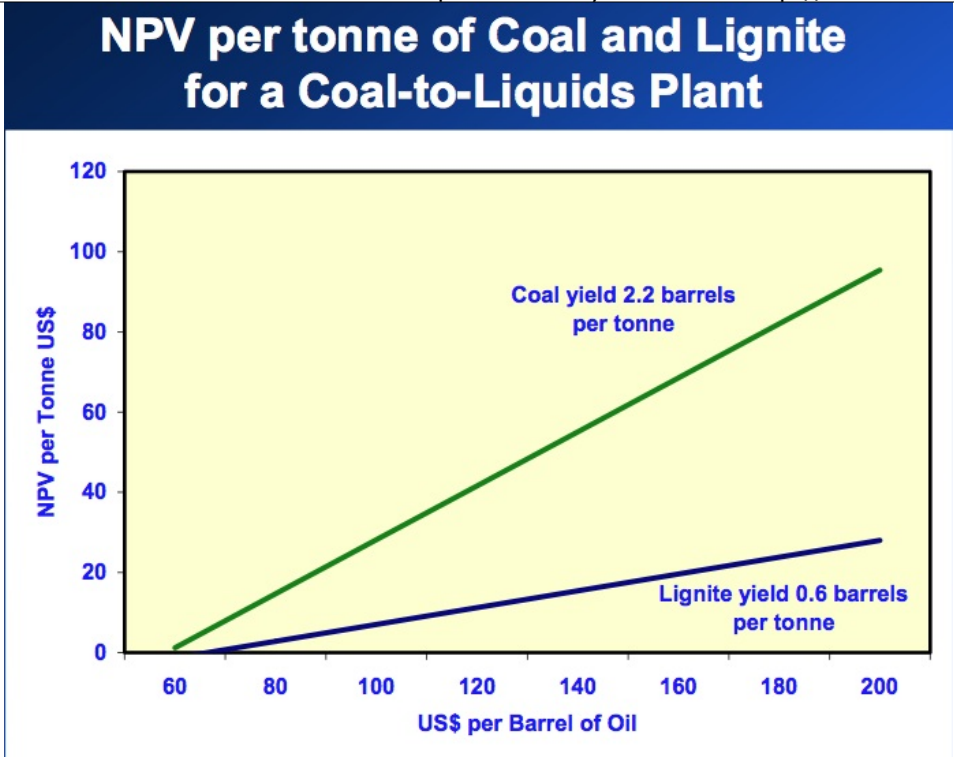
Country	Project	Project Type	Startup	Capex \$ billion	Recoverable m bbls	Capex/ boe
Canada	Fort Hills Project	Tar sands	2011	\$30.2	4,700	\$6.40
Angola	Pazflor	Deepwater oil	2011	\$9.4	750	\$12.50
Norway	Snohvit Area	Deepwater LNG	2007	\$9.1	1,302	\$7.00
Nigeria	OPL 222	Deepwater Oil	2011	\$5.4	620	\$8.70
US	Wyoming CTL	50,000 bopd CTL	2013	\$4.20	665	\$6.32

### Slide 17

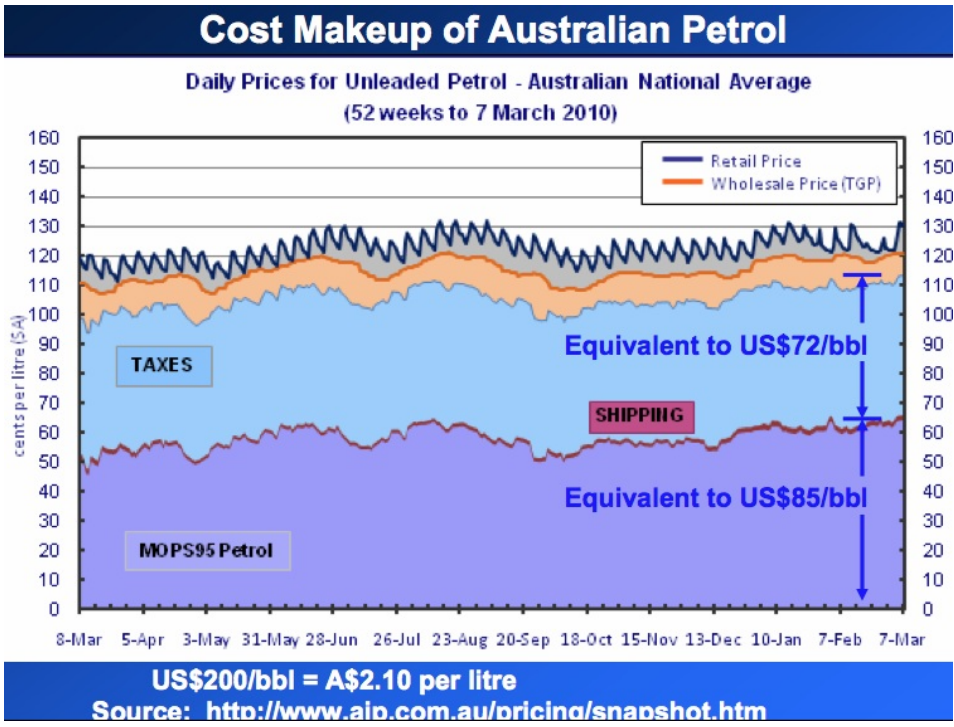
David Archibald provides the following additional information about costs:

The cost of CTL is about \$45 per bbl (opex and depreciation) at zero feedstock cost. That is based on the CCT process which saves on capital cost by not reforming the tail gas. The depreciation charge in that \$45 is \$14 per bbl. It could be \$28 per bbl.

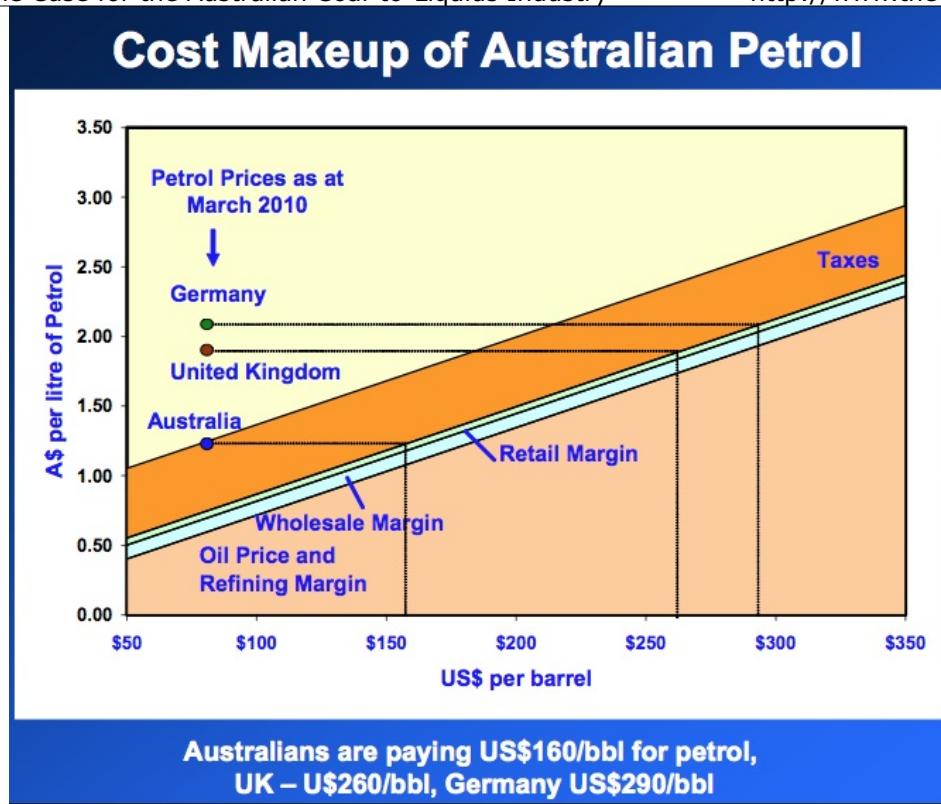
Assuming 2 bbls per tonne of coal, the coal cost component per bbl is half the cost of coal per tonne. So \$40 per tonne coal would take it to \$65 per bbl.



Slide 18



Slide 19



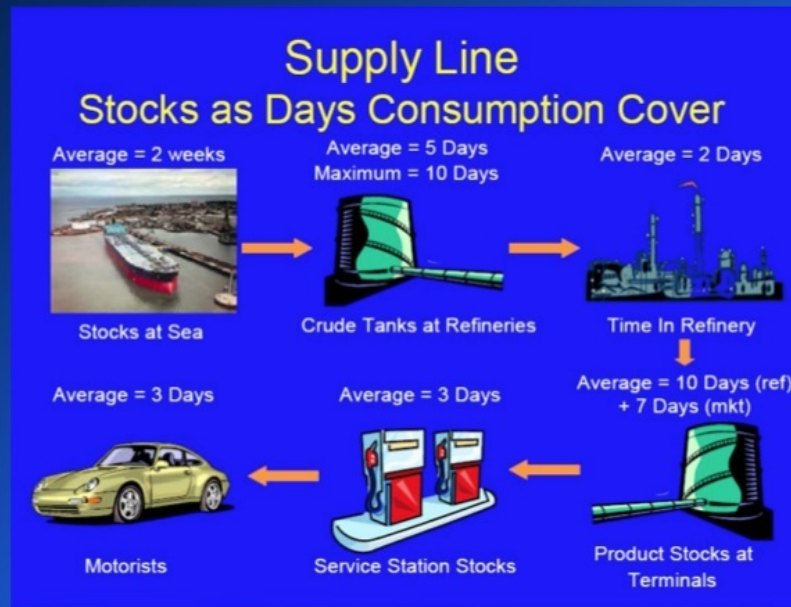
*Slide 20*

## Let's encourage CTL plant building.

- Provide accelerated depreciation – operators won't have to pay tax until they get their capital back.
- Use the fuel excise regime to provide price support.
- Rate of one cent reduction in excise per litre of product for every dollar that the oil price is below A\$70 per barrel.

*Slide 21*

## We are living on a hair trigger in terms of stock cover.



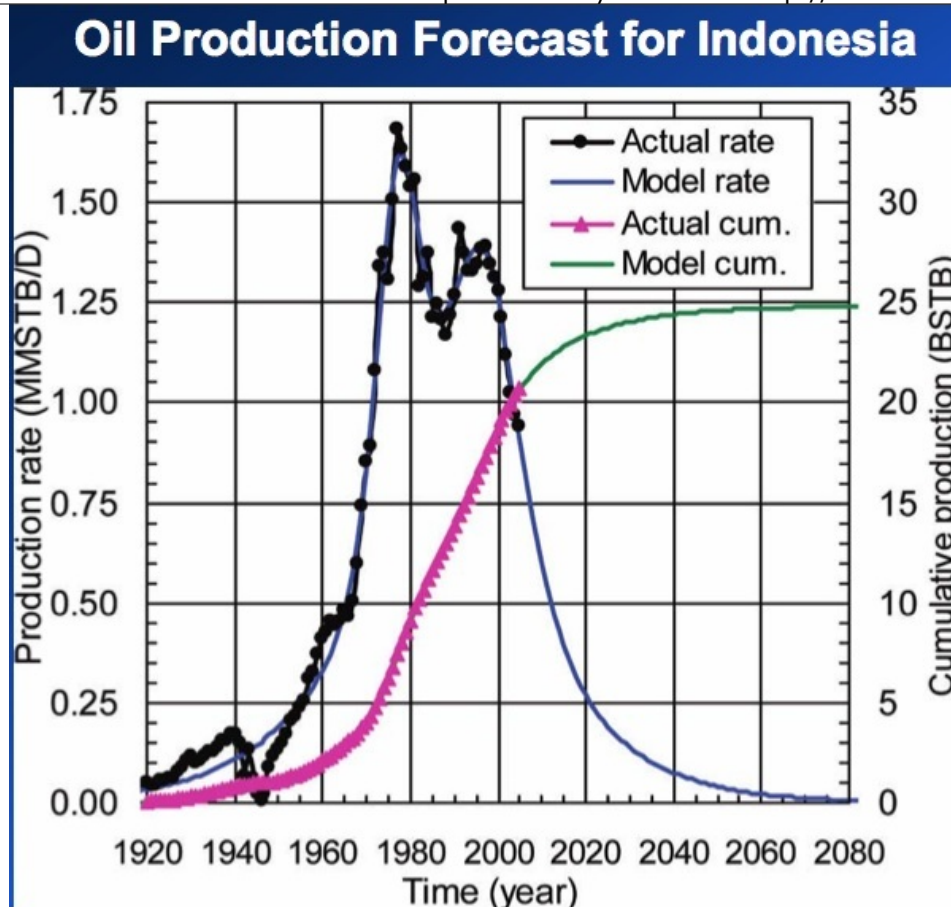
Source: Australian Institute of Petroleum

*Slide 22*

## Capital Intensity per Motorist

- US\$80,000 per barrel of daily Fischer-Tropsch production is A\$274 per barrel of annual production.
- A car doing 20,000 km per annum at 10 km per litre would consume 2,000 litres, which is 12.6 barrels.
- The capital cost of that would be \$3,452.
- For a car costing \$25,000, that would be 14% of the capital cost of the car.
- The Fischer-Tropsch plant will last a lot longer than the car.

*Slide 23*



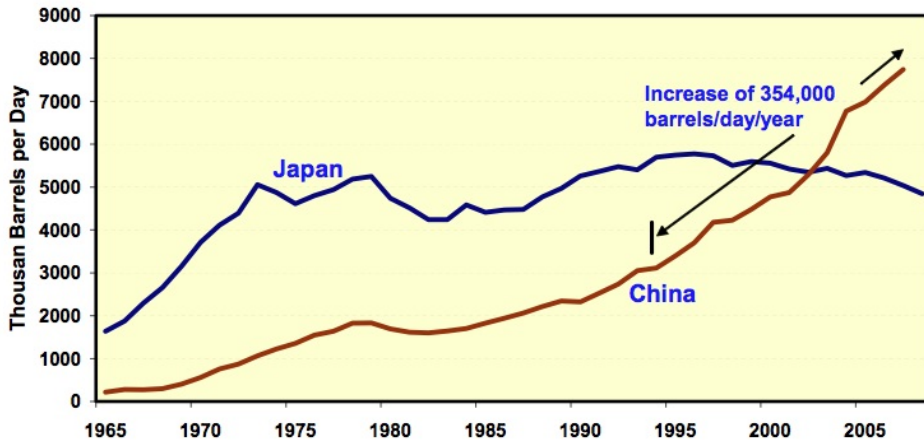
*Slide 24*

## Indonesian Coal-to-Liquids Projects

- **Sasol has announced an intention to build an 80,000 BOPD CTL plant in Indonesia using lignite.**
- **Ultimately they expect to produce 1,000,000 barrels per day from lignite in Indonesia.**
- **At that rate, they will produce 20 times as much CO<sub>2</sub> as the Latrobe Valley power plants.**
- **Sasol, with Tata Steel, will also build an 80,000 BOPD plant in India.**

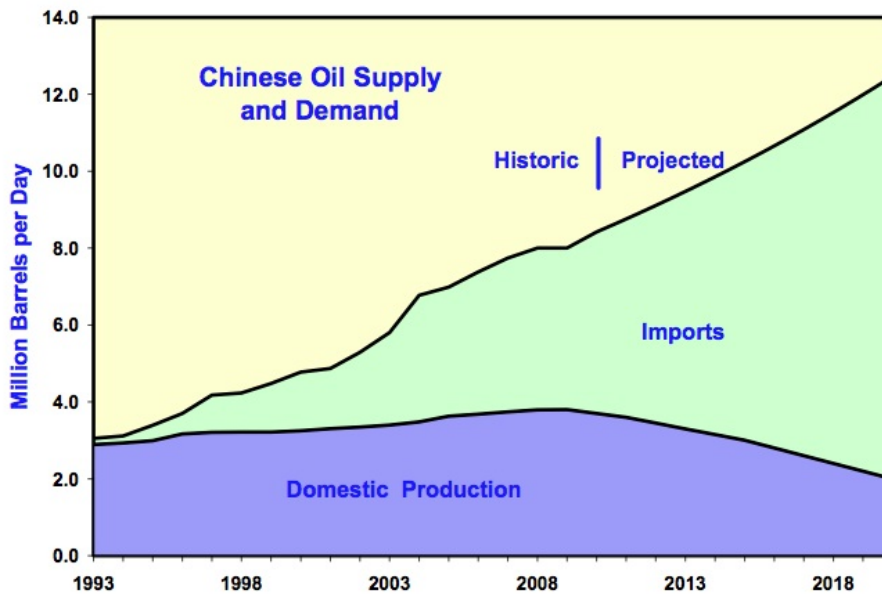
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# Oil Consumption – China and Japan



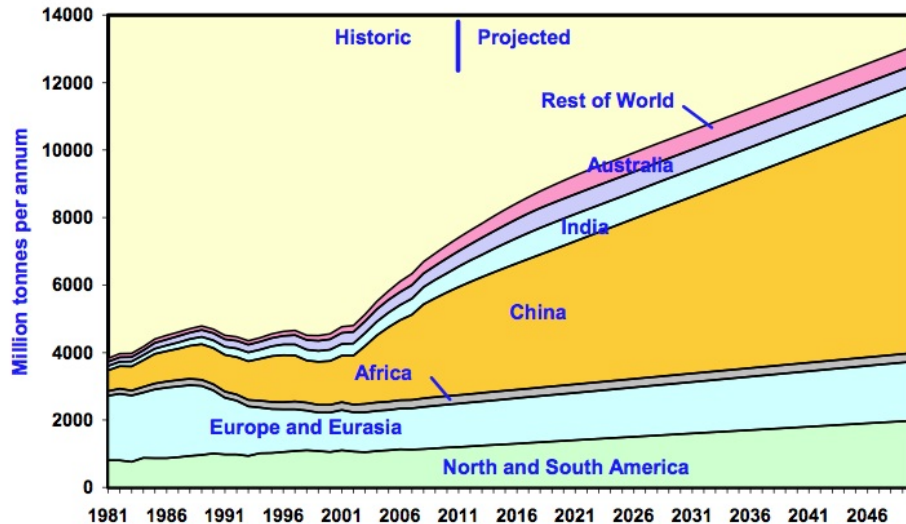
Slide 26

## The rate of Chinese import demand growth increases from here.



Slide 27

## World Coal Production



**China's coal reserves are four times that of the US.**

*Slide 28*

Note: The estimate of recoverable reserves for China used in Slide 28 is 1 trillion tonnes. According to this report on [China's coal industry](#), China's recoverable reserves "exceed 1 trillion tonnes".

### **If Australia doesn't install Coal-to-Liquids:**

- **The oil price will rise.**
- **The trade deficit will blow out.**
- **We will have a severe recession.**
- **National security will be at risk.**

*Slide 29*

## The Optimum Future

- **Install Coal-to-Liquids plants to replace declining domestic oil production.**
- **Replace coal-fired power generation with thorium-based nuclear generation.**

*Slide 30*

## What we need to do:

- **Repeal the National Greenhouse and Energy Reporting Act 2007.**
- **Repeal the Renewable Energy Target Scheme (amended 24<sup>th</sup> June, 2010).**
- **Provide excise support to Coal-to-Liquids project to reduce financing risk.**
- **Provide accelerated depreciation to Coal-to-Liquids projects.**

*Slide 31*



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