Presentation to the Prime Ministers Task Force on Biofuels

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DAVCO FARMING

DAVCO
BURDEKIN

We specifically wish to assist the Taskforce in relation to the likely costs and benefits of Biofuels production using sugar cane as the feedstock.

Davco Farming began growing sugar cane in 1987 and currently produces in excess of 220,000 tonnes annually, on 2,000 irrigated hectares in the Burdekin district of North Queensland. Davco Farming has developed this farm on what was previously regarded as 3rd rate cattle grazing land.

Davco Farming has pioneered a number of new technologies in it's farm development and crop production operation;

1. 1979 - pioneered laser levelling on heavy clay soils with minimum slopes.
2. 1980's – developed large scale irrigation operation with full tailwater recycling.
3. 1993 – first cane harvester in the world to cut 100,000 tonnes in a season.
4. 1996 – developed the worlds first yield mapping system in sugar cane with Dr Graeme Cox.
5. 1998 – first to introduce GPS guided tractors (with accuracy of + / - 20 mm) to sugar industry.
6. 1998 – started development of a "controlled traffic" system of cane growing.
7. 1999 – introduced two row harvester with tracks at 3 metre gauge to facilitate CT system.
8. 2000 – Davco Farming principal David Cox was awarded the Sugar Industry Year 2000 Innovator of the Year.
9. 2000 – designed and had manufactured "wide gauge" cane transporters to fit the 3 metre CT system.

Davco Farming is currently involved in a detailed feasibility study for the establishment of a Brazilian designed sugar cane processing facility for the production of ethanol, sugar and electricity for external supply.

This AUSTCANE project is being funded by 142 individual sugarcane farmers in the Burdekin District assisted by 50% funding by the Queensland Government.

Studies completed by Davco to assist Biofuels Taskforce

- **The preliminary costing of adding ethanol distilleries to existing sugar milling facilities in Queensland.**
- **The preliminary costing of expanding sugar cane & ethanol production in new “greenfield” areas. (Ord River Stage 2).**
- **The study of world markets of both ethanol and fossil fuels suitable for motor vehicles and internal combustion engines.**
- **The preparation of excel worksheet models so that current and future economic impacts for both producers and the Australian economy at large can be tested under differing price and production cost scenarios.**
- **The collation and correlation of a number of scientific and economic papers which we believe are important for consideration by the Biofuels Task Force.**

Summary of Davco Farming's Conclusions

- **That the sugar cane growing industry has an important role to play in the provision of renewable fuels for Australian consumers initially and for valuable export income in the future.**

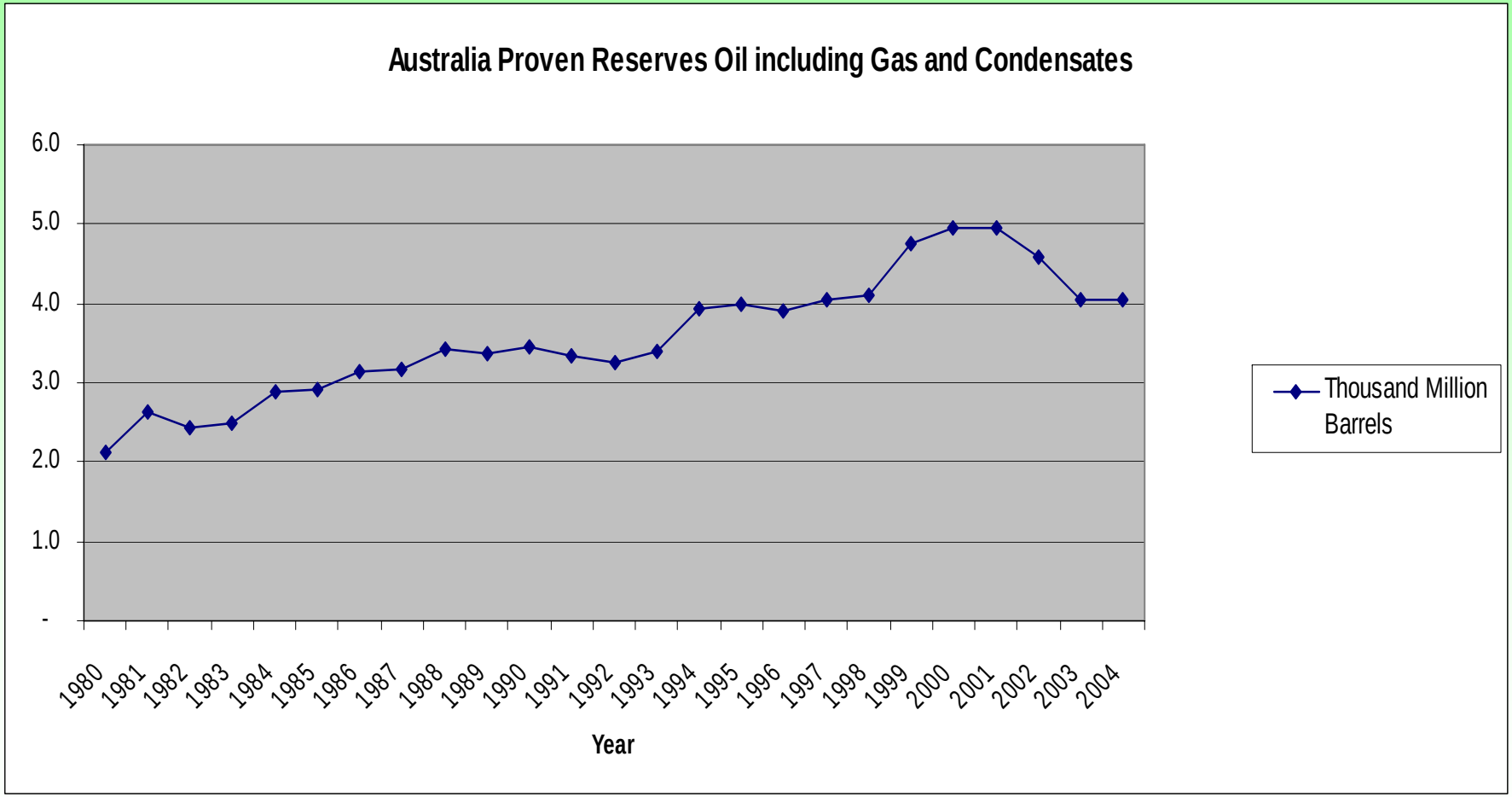
- **That the Australian economy will benefit through a net increased income tax base derived from a profitable Biofuel Industry.**

- **That Australia's economy and national security will be greatly enhanced through.**
  - **Reduced need for imports**
  - **A greater self sufficiency of fuels suitable for existing motor vehicles and the existing fuel distribution infrastructure.**
  - **An economically sustainable rural and regional economy.**

- **That Australia's international reputation will be greatly enhanced by a genuine commitment to Green House Gas (GHG) abatement.**

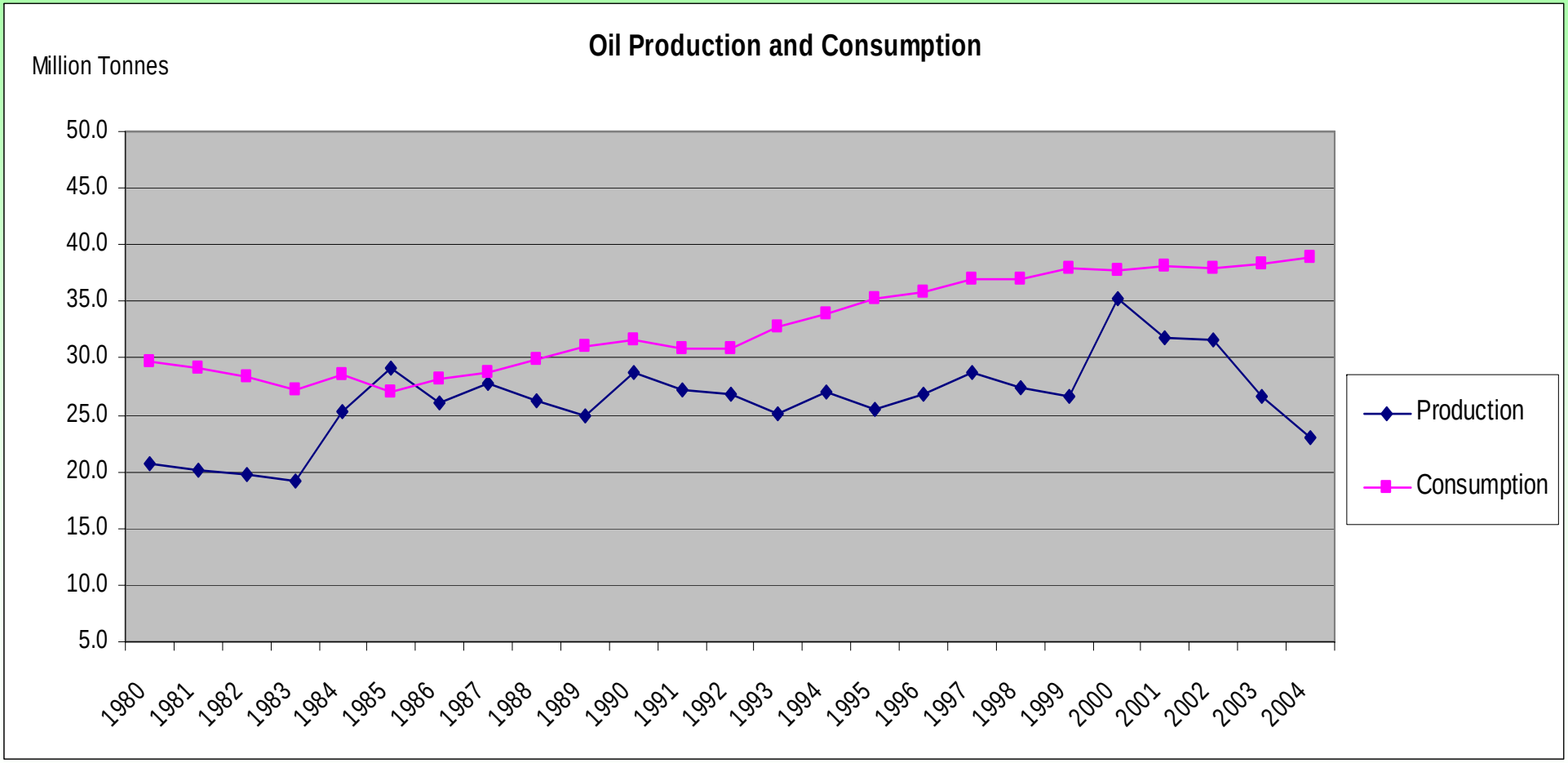
- **That these benefits can only be gained by a genuine commitment of Government through the setting of realistic mandatory targets for renewable fuels and assisting legislation that guarantees market access to the existing distribution infrastructure.**

Why Australian's should be concerned about fuel security



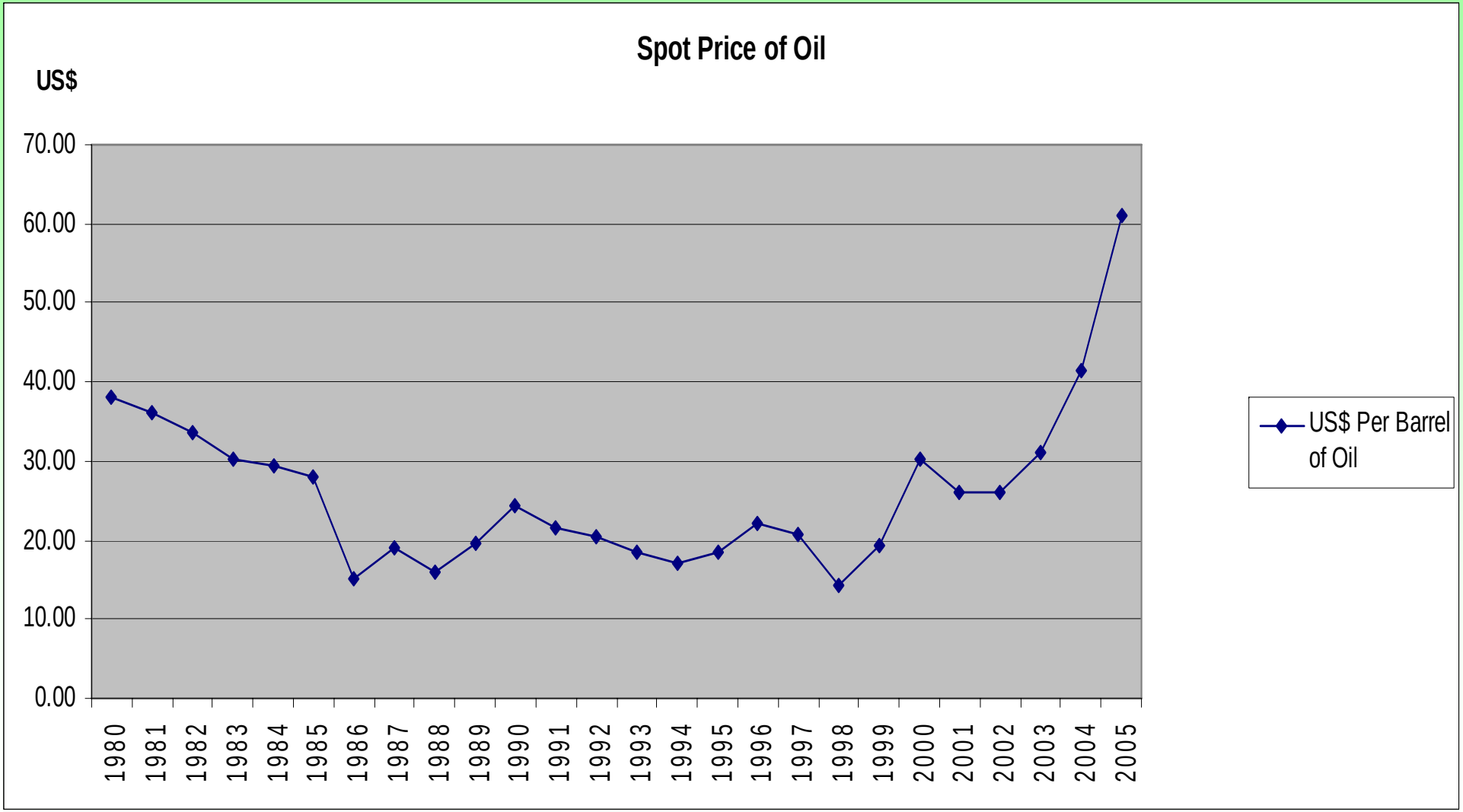
Source BP Statistical Review 2004

Australia's consumption and production of Oil, Gas and Condensates



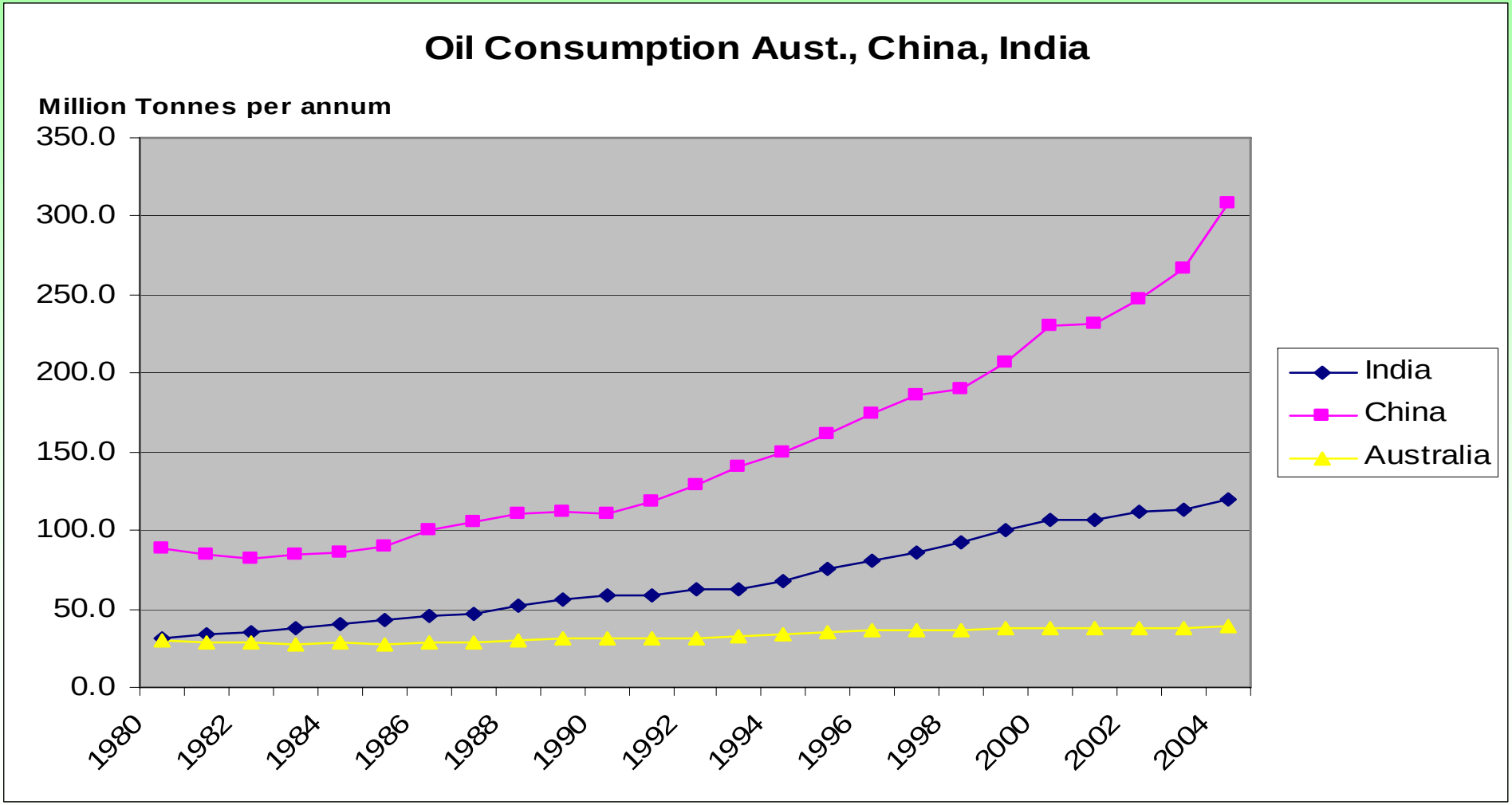
Source BP Statistical Review 2004

The Price of Oil



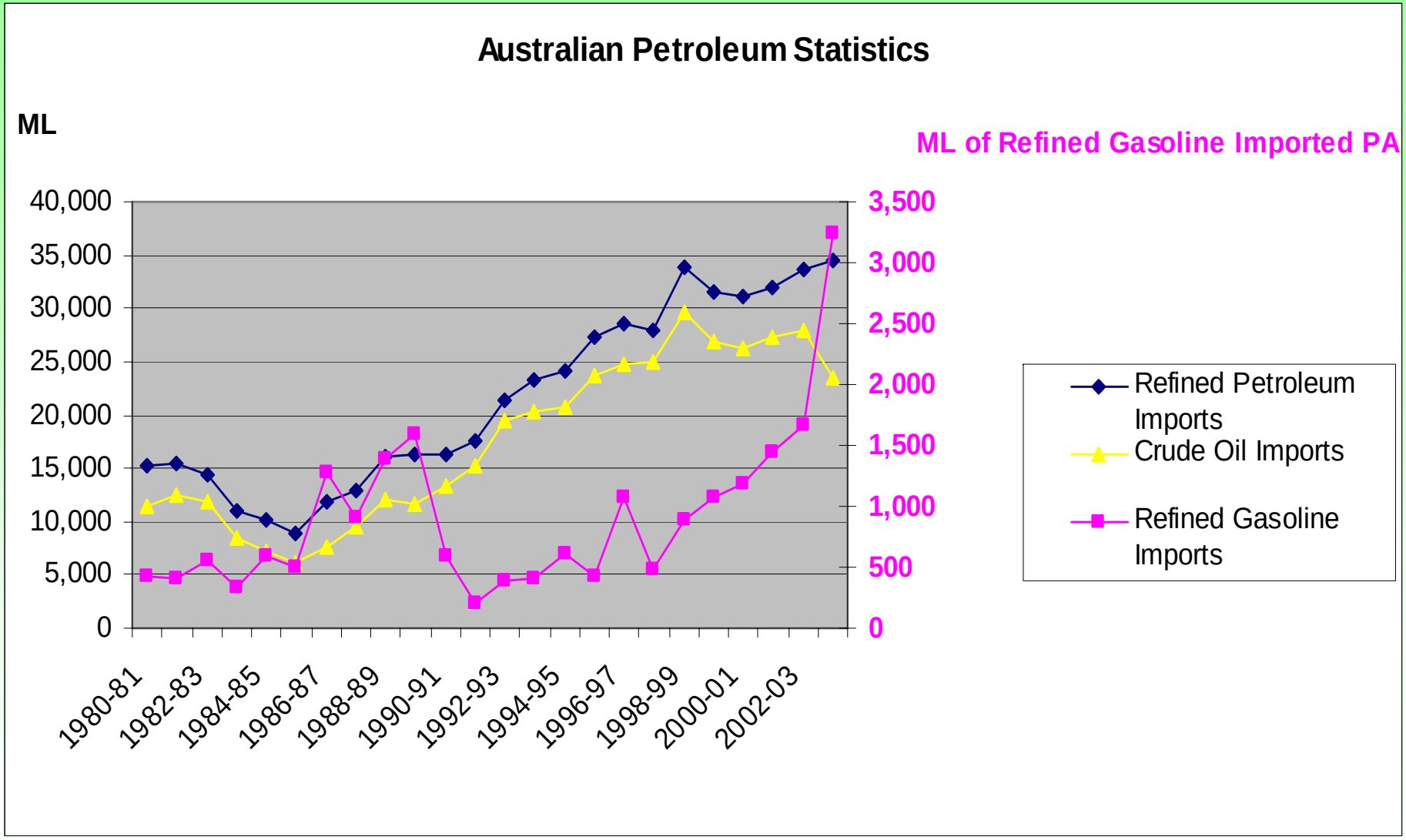
Source BP Statistical Review 2004 + Current Price

Why the Price of Oil will Continue to Increase



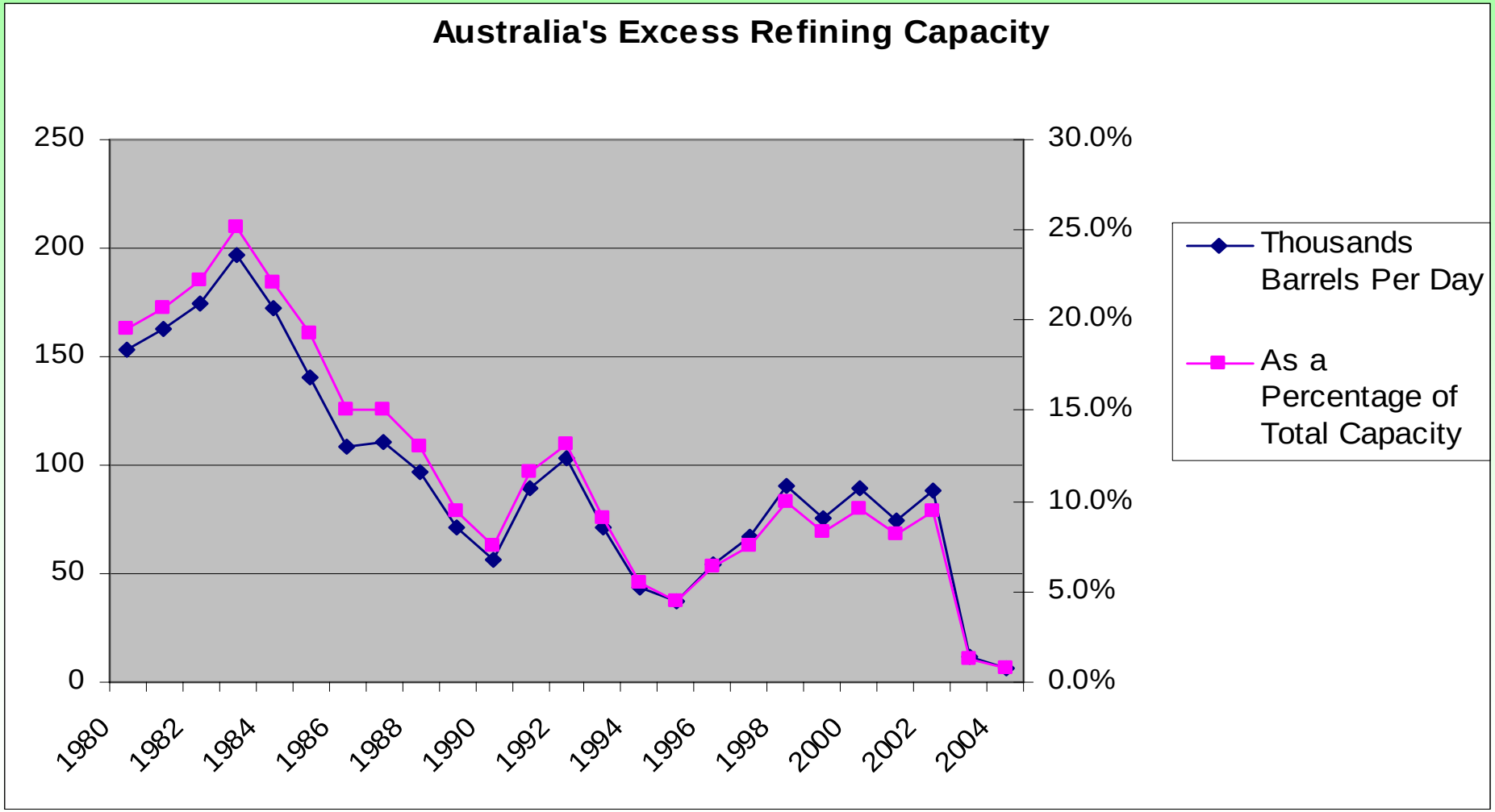
Source BP Statistical Review 2004

Australia's Imports of Refined Petroleum and Crude Oil are Skyrocketing



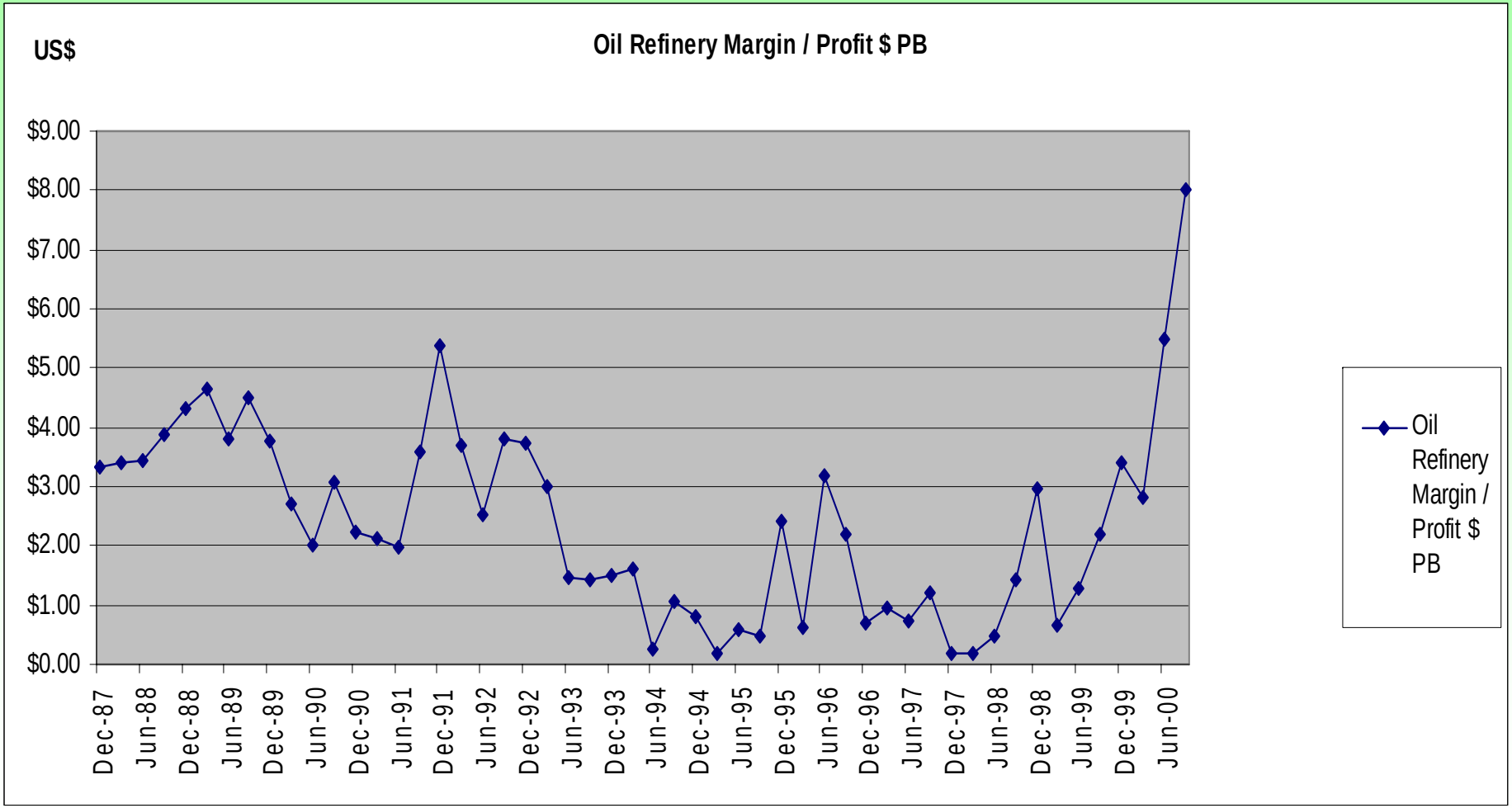
ABARE June 2005

Why are we importing gasoline and not unrefined crude oil?



Source: BP Statistical Review 2004

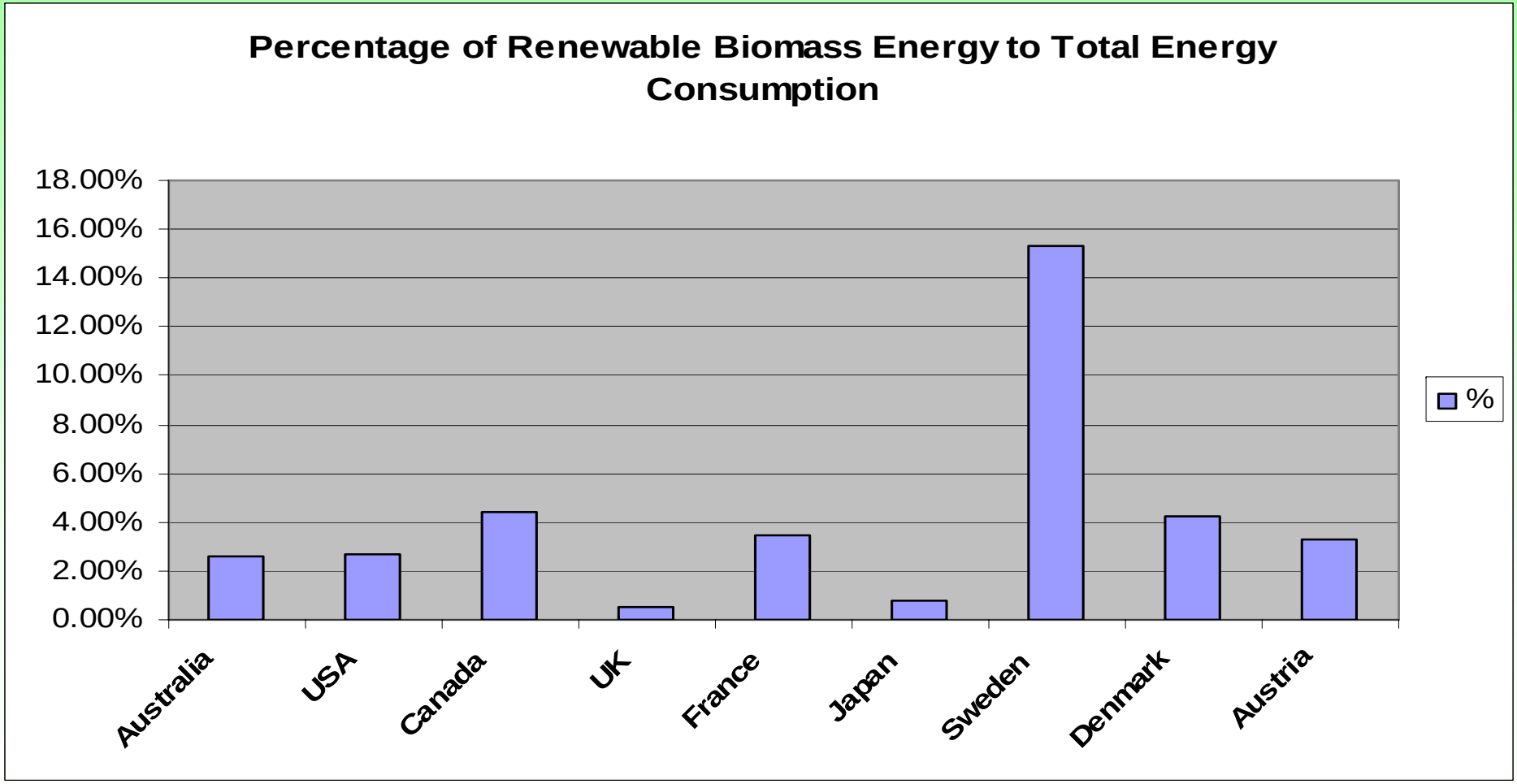
Who is making the profits ?
What country collects the Tax ?



Source BP Statistical Review 2004

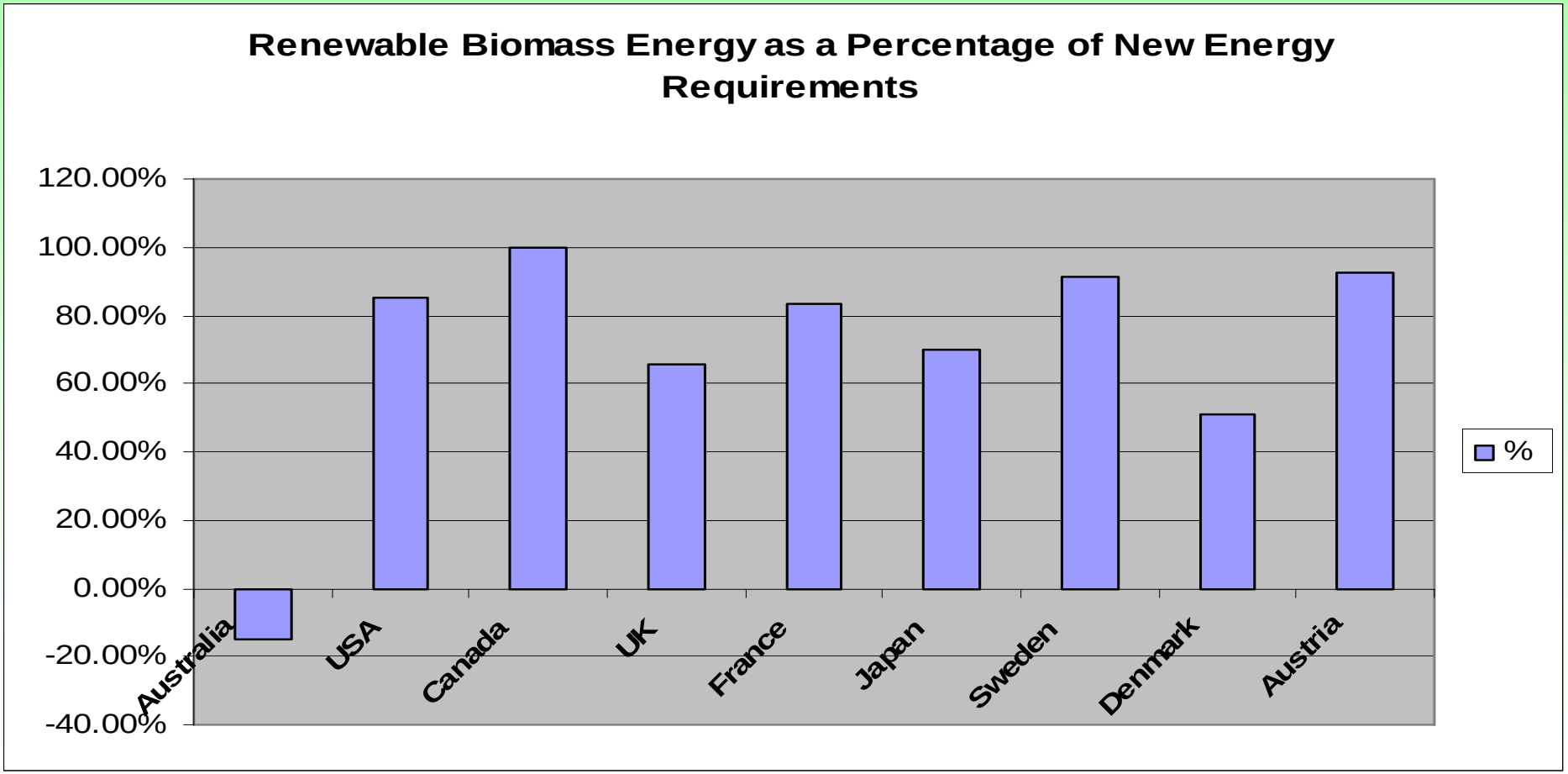
Australia's record of use of renewable Biofuel is not too bad in comparison to other countries.

However 50% of this is by the sugar industry and the use of bagasse for heat & electricity



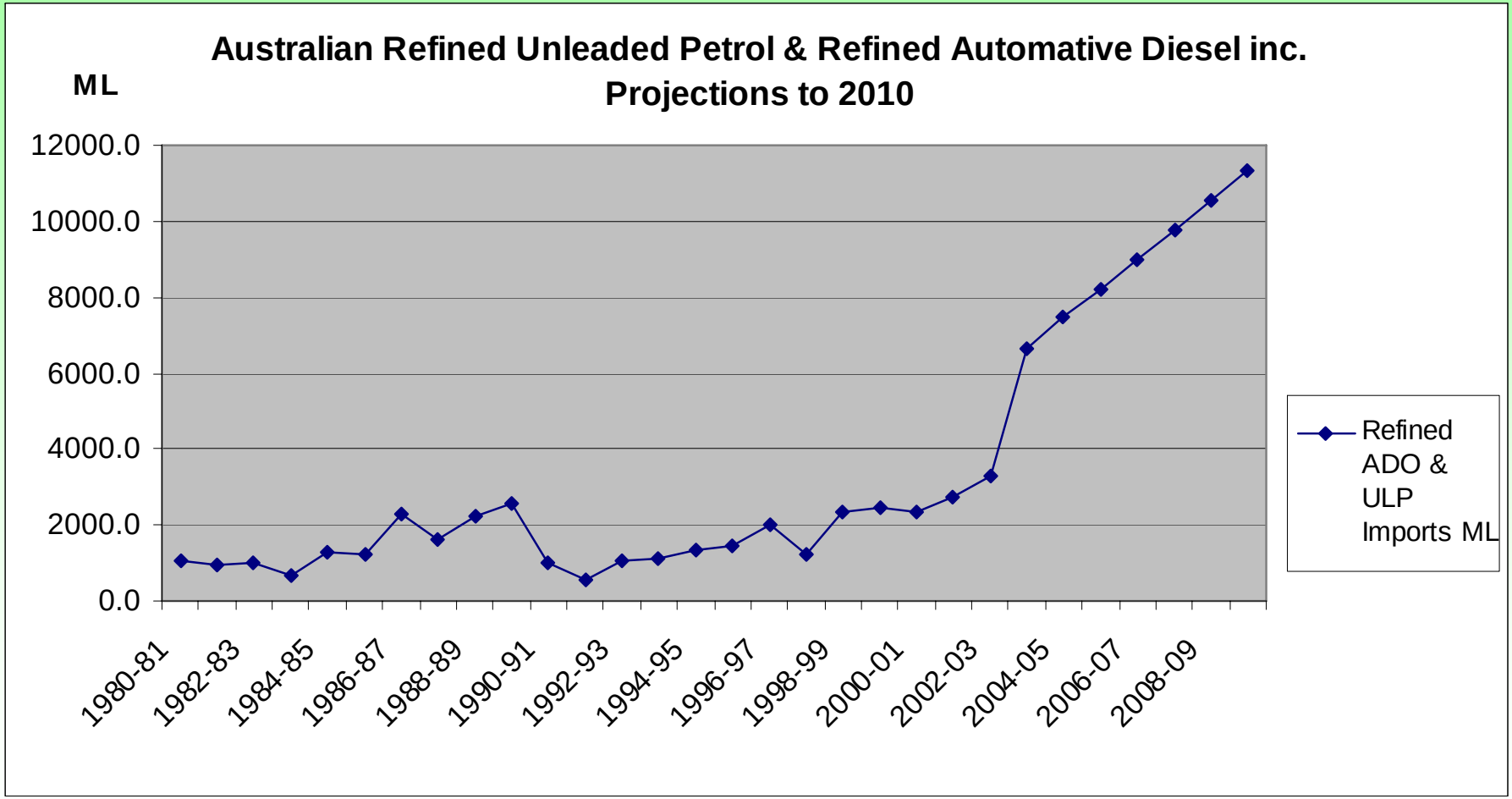
National Food Research Institute Japan, Jan 2005, and ABARE June 2005 statistical release

However compare the current policy of Australia with other Governments positive policy settings.



National Food Research Institute Japan, Jan 2005, and ABARE June 2005 statistical release

This is our history and projections for the next 5 Yrs

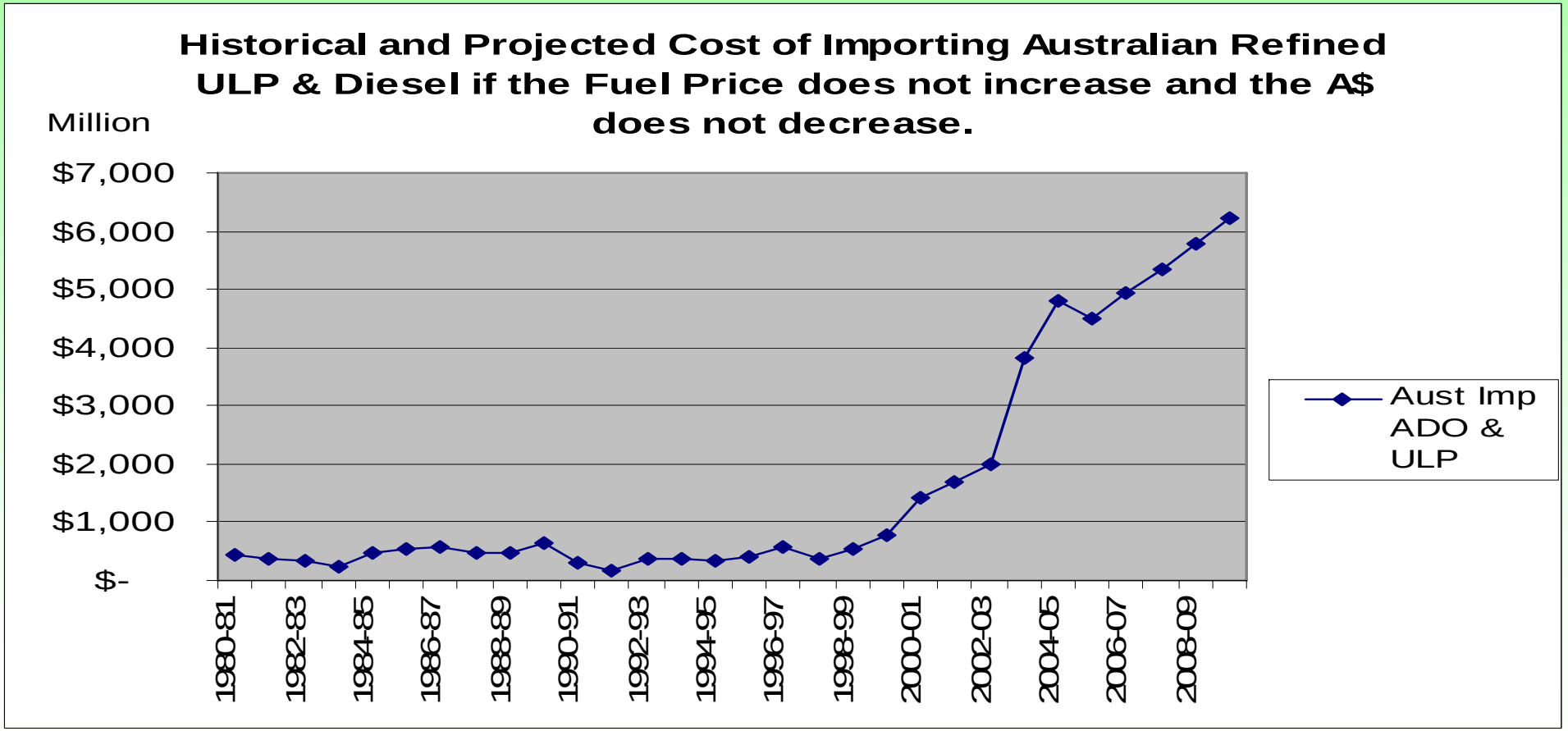


Source Data: ABARE June 2005 Australian Consumption and Imports, Australian : BTRE Australian Petroleum statics fuel sales

In 2010 our imports of refined gasoline and automotive diesel will exceed $500 million per month

(at current oil price and exchange rates)

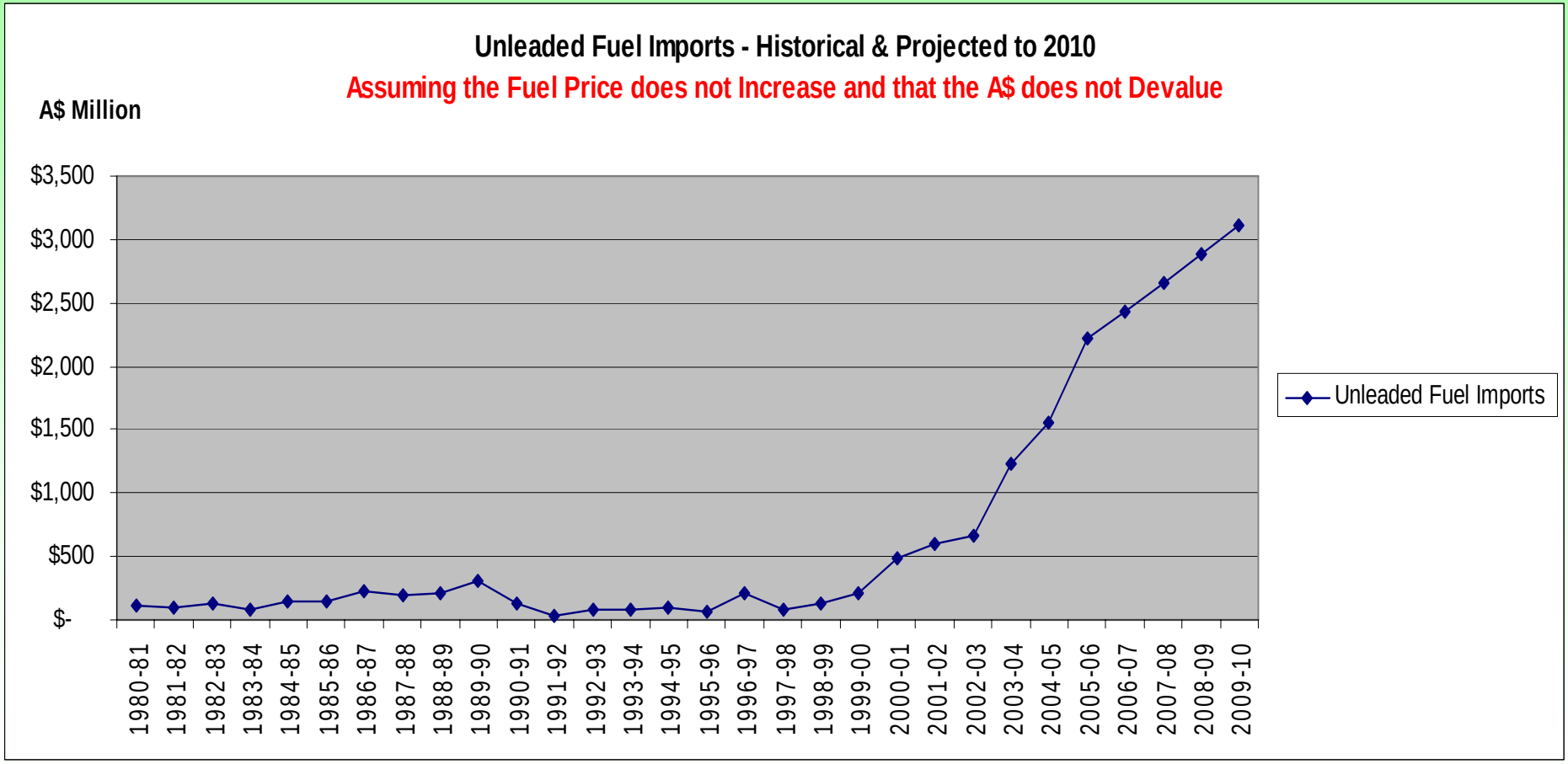
This does not include crude oil Imports that are refined here



Source Exchange Rates RBA projected use based on 5 yr average growth : Historical Data BP Statistical Review 2005 and ABARE

Projected and Historical Unleaded Fuel Imports

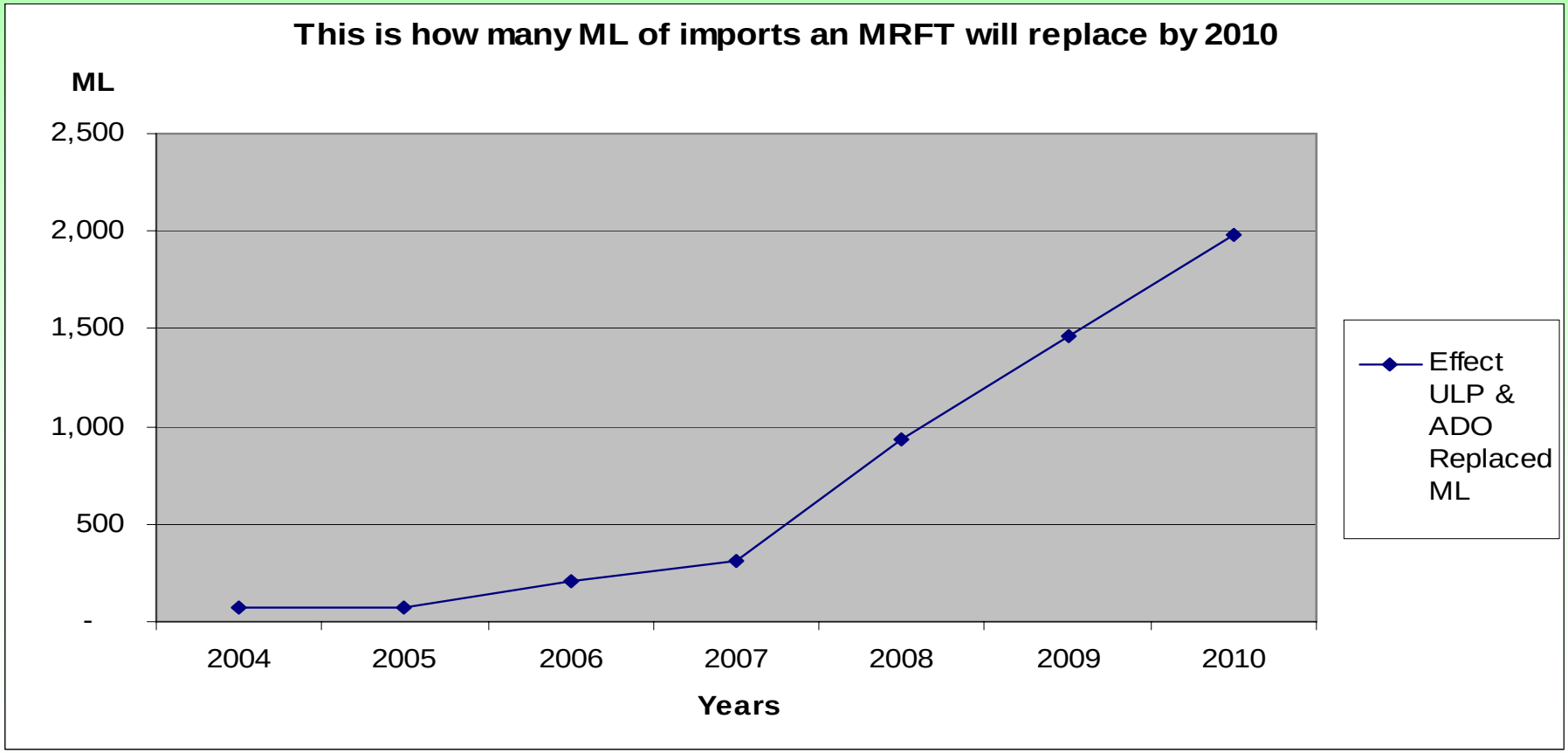
This does not include crude oil Imports that are refined here



Source data : BP Statistical Review and ABARE: Ex RBA

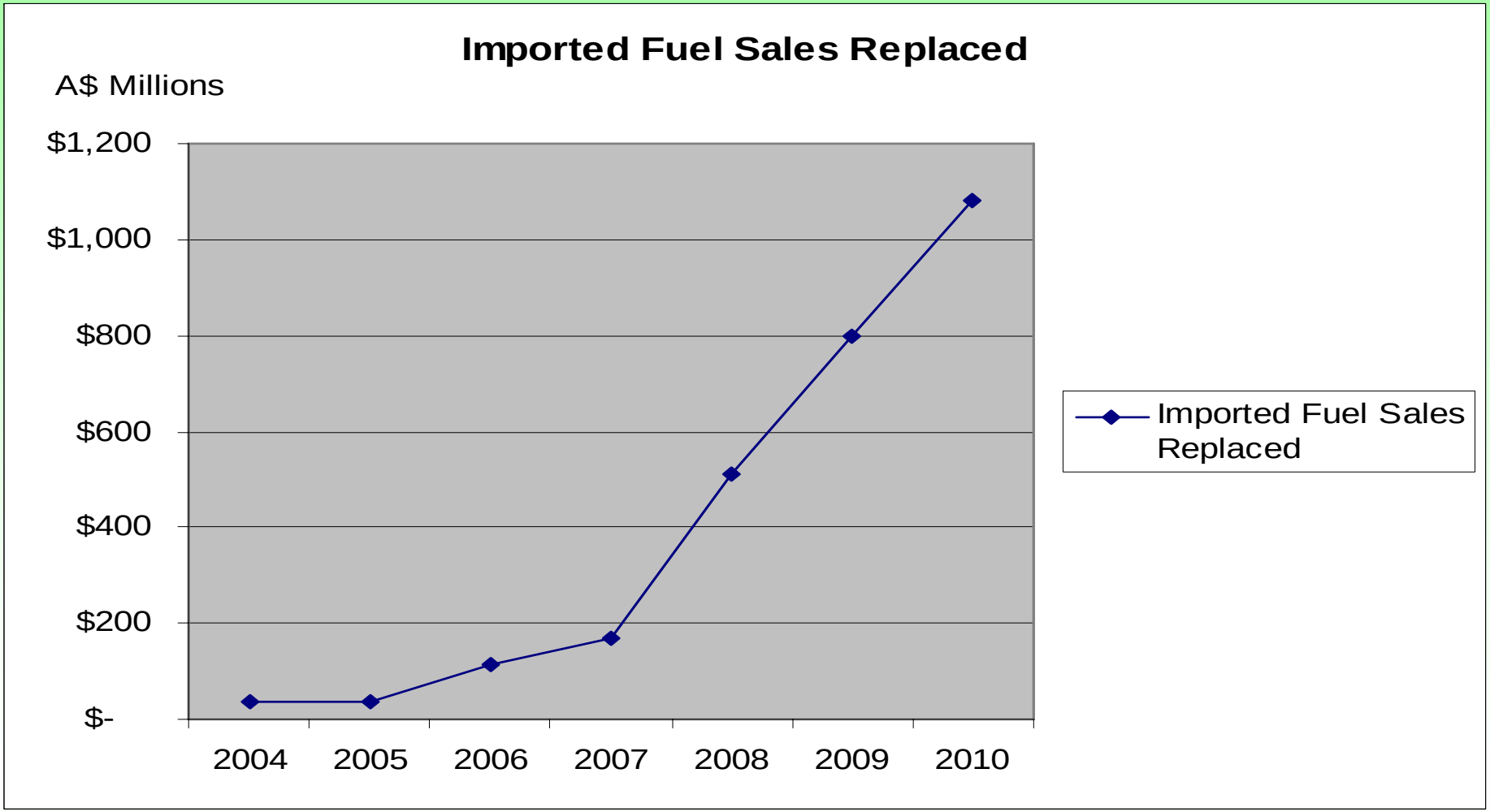
A Mandatory Renewable Fuel Target (MRFT) on ULP of 10% and ADO of 4% will replace this amount of refined fuel imports by 2010.

This can be achieved by combining the following three steps-
1. Fully utilising existing ethanol facilities at no additional capital cost.
2. Proceeding with planned distilling facilities in sugar & grain industries.
3. Placing ethanol distilleries on existing Sugar Cane Mills to divert 60% of our exported sugar (juice equivalent) to replace imported refined ULP & ADO.



Source RFA and Davco research:

This is Australia's Potential Savings in Imports

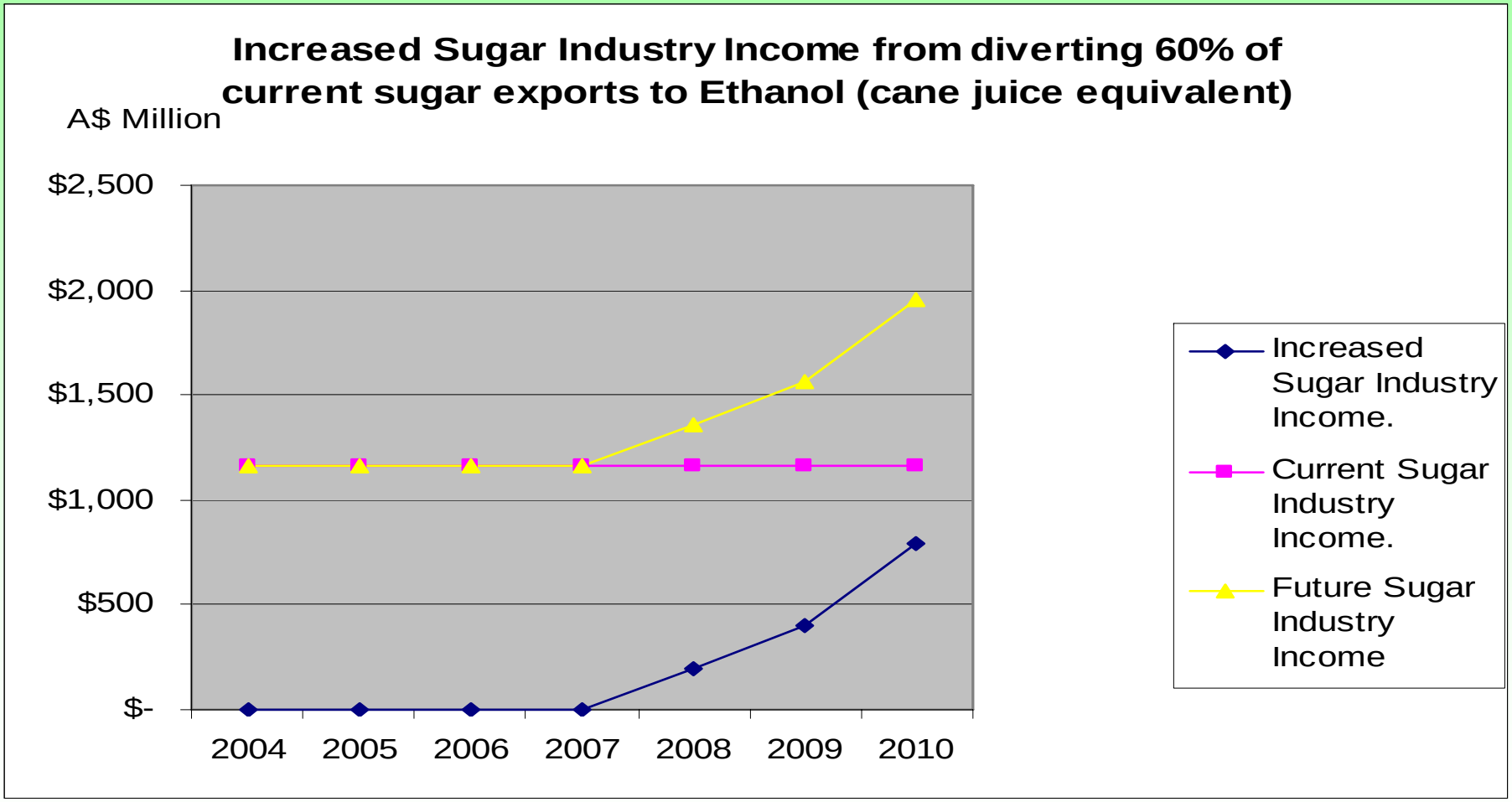


Source: Davco Calculations

What this means to the Sugar Industry.

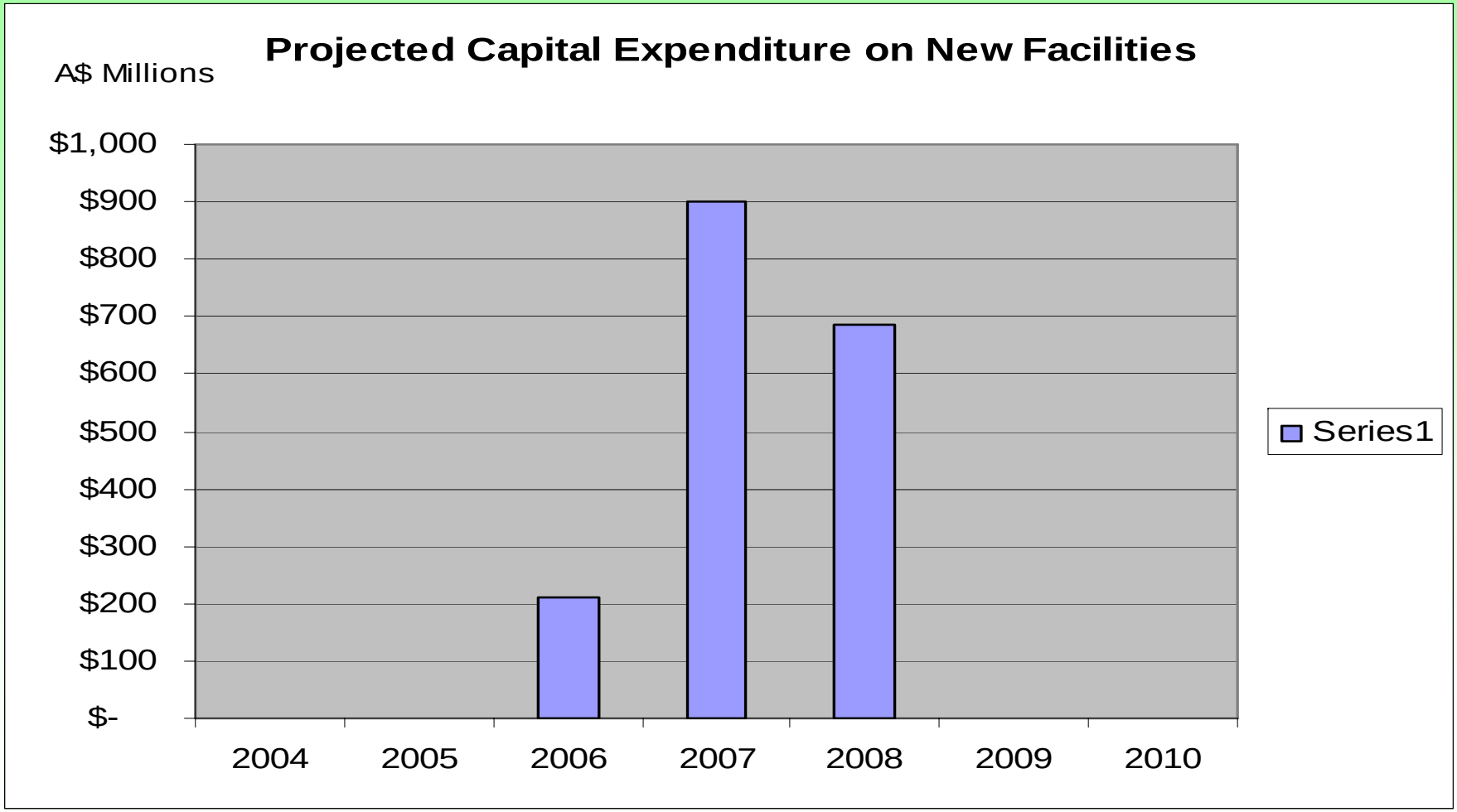
Income increased in A$ by substitute Ethanol for Sugar

This means that the Sugar Industry can return to a sustainable income level similar to its income in 1994



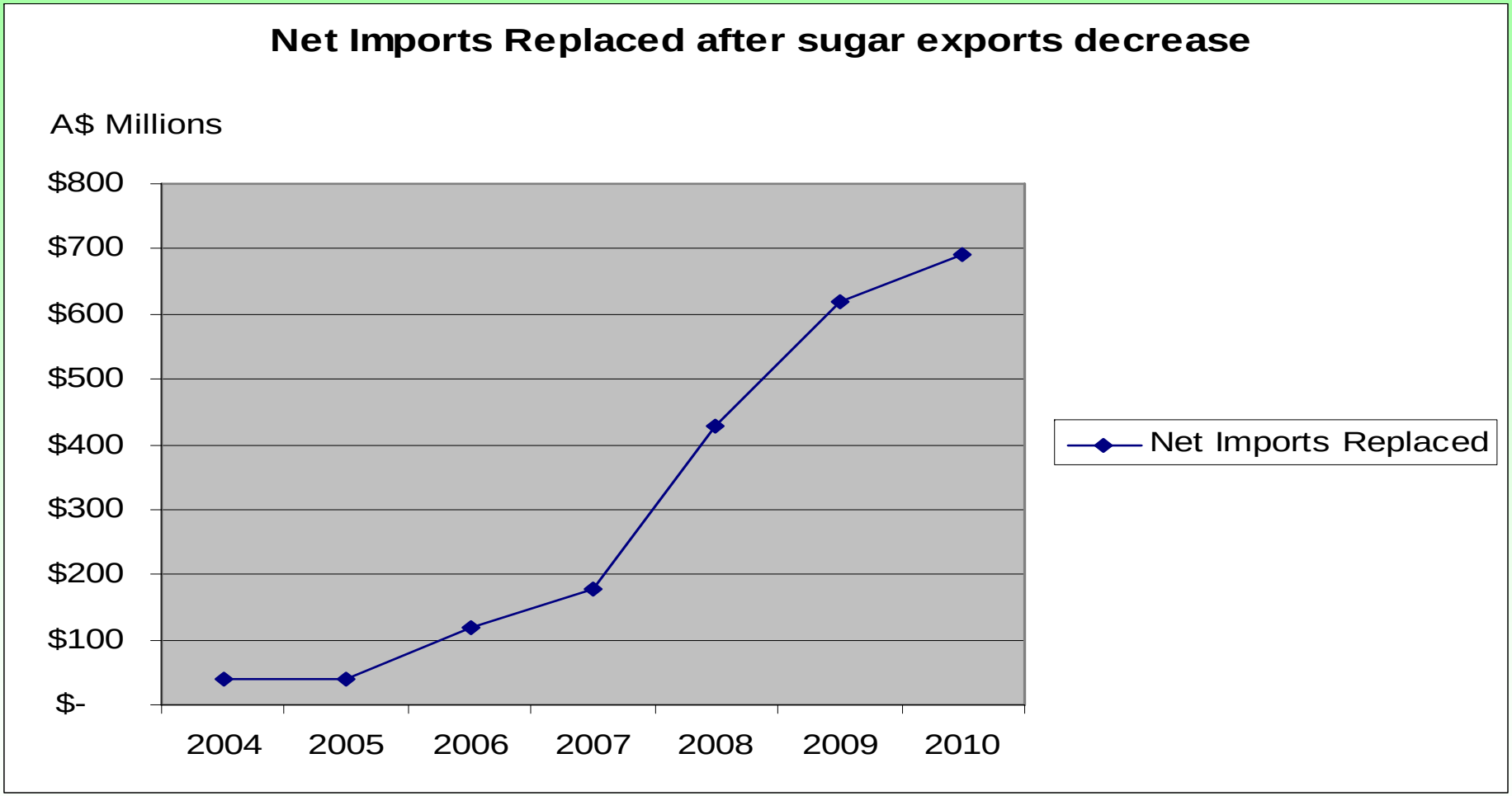
Source Davco Research & Current World Market Prices

Projected Capital Expenditure on New Ethanol Facilities



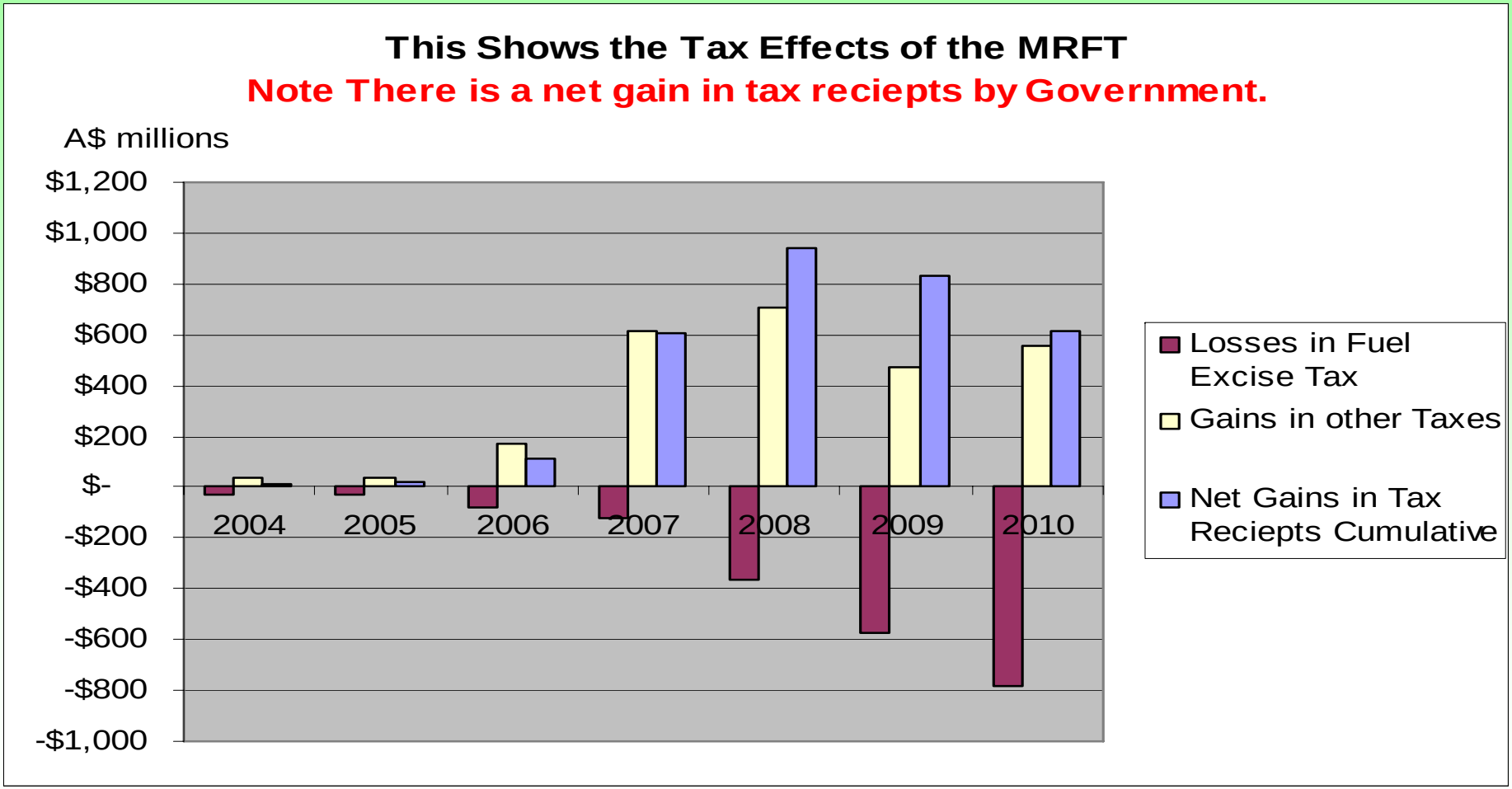
Source RFA: Sugar Research Institute & Davco Estimates.

This is the net Balance of Trade Impact after foregone Sugar Exports are Deducted



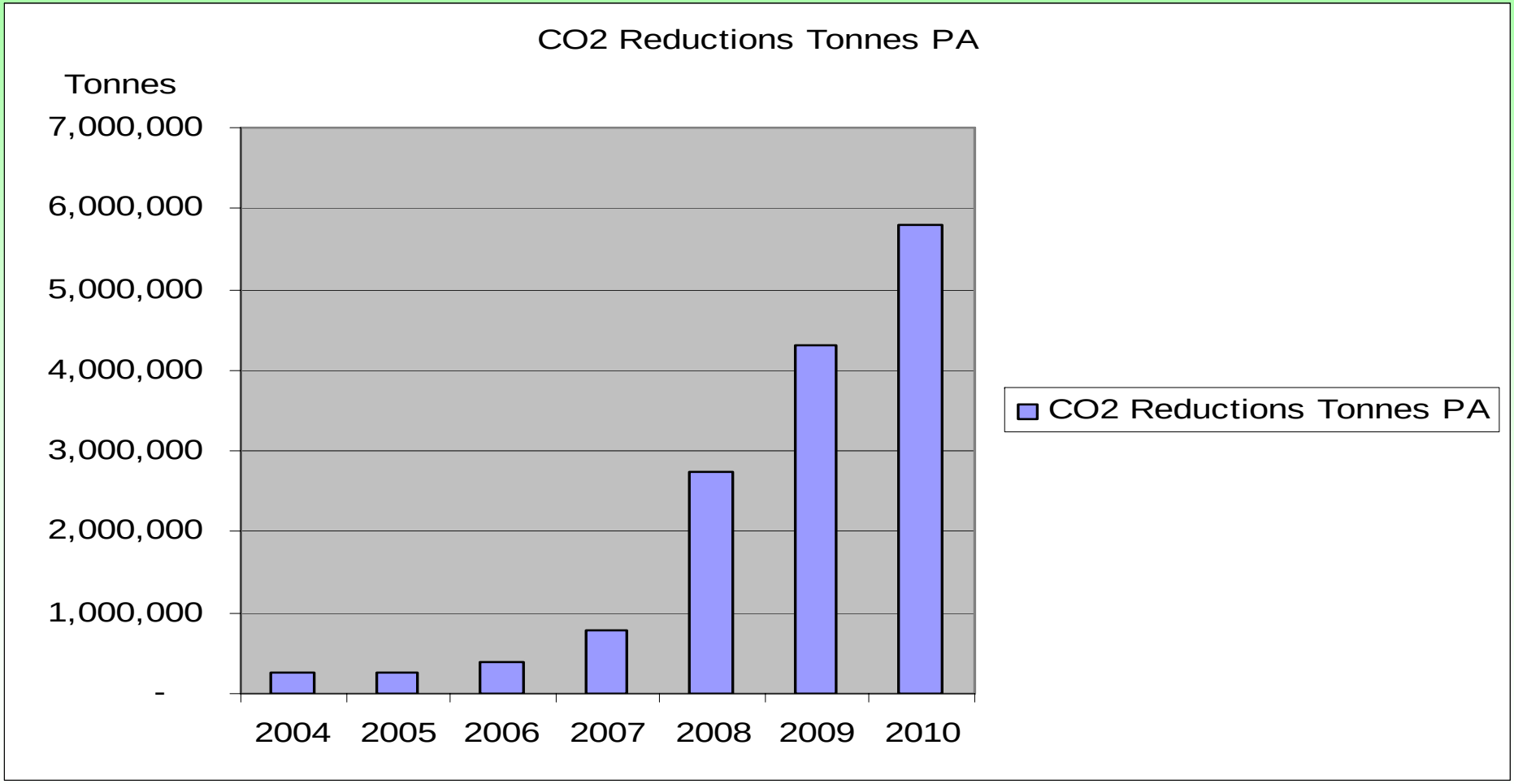
Source Davco Calculations

This calculation indicates that the effective Tax Revenue received by Government is A$ 609 million Greater by the introduction of an MRFT up until 2010



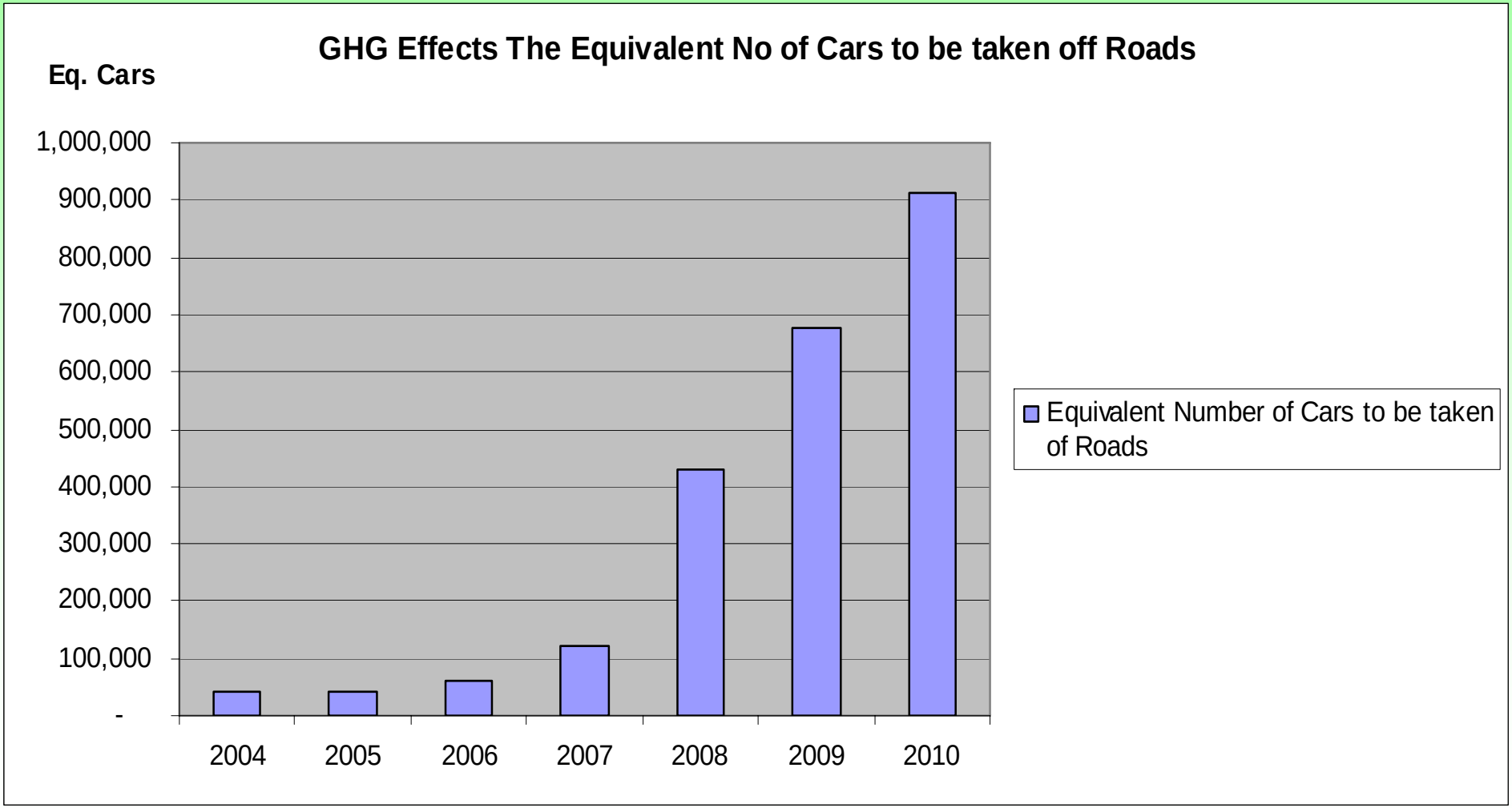
Source Davco Farming Calculations Based (Other Income Taxes @ 30%; Multiply for flow on at 2.2 & calculated on Income base of 85% of increased income.

This shows the Equivalent Tonnes CO2 saved Per Annum



Based on 2,590 Tonnes per ML ; Macedo & ors Brazil: Accepted for Carbon Credits

This shows Equivalent Cars to be taken from Australian Roads

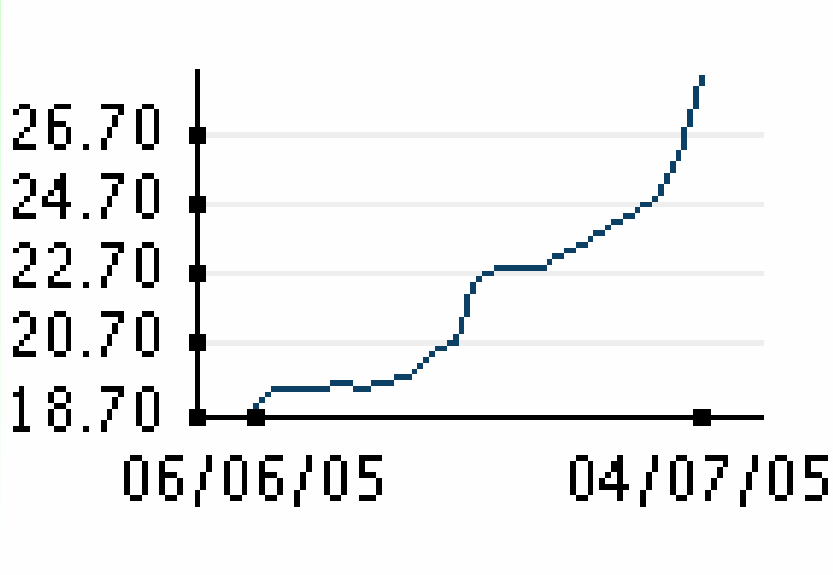


Calculations Based on BTRE no of cars & GHG effects

Why is Australia the Odd Man Out?

- The Weekend Australian July 2-3 2005 Page 11
- The US Economy “hooked” on Middle East Oil
- Copenhagen: President George W Bush has said that the US is “hooked” on Middle East oil.
- **“We’re hooked on oil from the Middle East which is a national security problem and an economic security problem.”**
- Mr Bush told *The Times* this week that leaders and scientists had to find a way “to drive better, to have better engines for our cars and different fuel sources for our cars.”
- He said the US was looking for ways to “diversify away from fossil fuels”

- **Carbon Credit Prices**
- **This price equals 11 cents per litre of Ethanol from Sugar Cane**
- **EUA price last 30 days**
- **04 July 2005**
  EUA 2005 (€/tCO2) €28.35 51% increase in the last 30 days



http://www.pointcarbon.com/article.php?articleID=6138&categoryID=364

Conclusions

- **Australia does have a significant economic problem with rapidly growing imports of Crude Oil and refined products driving future trade deficits.**

- **Australia does have a growing international credibility problem towards the Governments lack of commitment to Green House Gas issues.**

- **Australia will soon reach critically low levels of self sufficiency in liquid fuels for cars and trucks in the event of an oil crisis induced by international conflicts or future oil price shocks.**

- **A mandatory renewable fuel target (MRFT) of 10% on unleaded petrol and 4% on diesel automotive fuels will increase government tax returns over the next 5 years significantly. This does not reduce tax returns as has been stated in its most misleading, simplistic and selective form.**

- **A MRFT will restore income equality in rural and regional areas of Australia and restore battered regional economies especially those dependent on sugar cane and grains.**

A Vision of our Future

SUGAR & ETHANOL PLANT IN BRAZIL

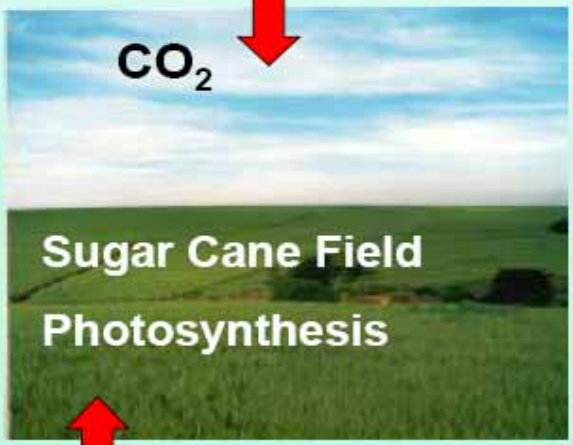
Ethanol Production & Energy Balance by Feedstock

Feedstock	Energy Output/Energy Input
Wheat	1.2
Corn (USA)	1.3 – 1.8
Sugar Beet (EU)	1.9
Sugar Cane (Brazil)	8.3

Gasoline	0.83

Source: F.O. Licht, Macedo, I et alii 2004 NREL 2002

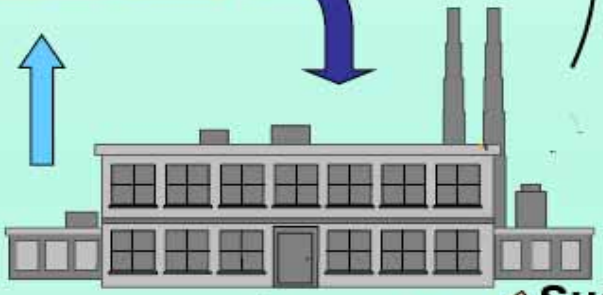
Sugar Cane and the CO_2 Cycle



Bagasse

CO_2

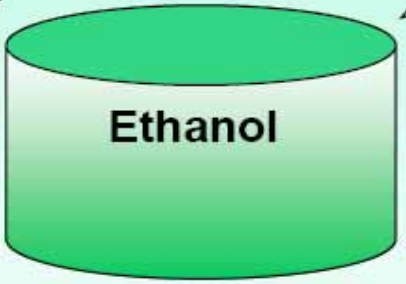
Cogeneration



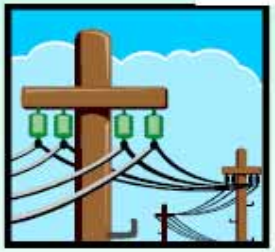
Sugar

CO_2

Neat Ethanol or Blends



Electric Energy



SOURCE: ADS

Greenhouse Effect Mitigation

Under Brazilian production conditions the substitution of ethanol for gasoline & bagasse for fuel oil avoids the emission of:

2.6 t of CO_2 equivalent/m^3 anhydrous ethanol

1.7 t of CO2 equivalent/m^3 hydrous ethanol

Source: Macedo, I et alii, 2004

New Uses for Ethanol

AVIATION FUEL
(100% ethanol airplane by Embraer. Already certified → production will start in 2005

INDUSTRIAL FUEL
100% ethanol boiler
(boiler can operate also on CNG or LPG)

Ethanol Vaporizer

Source: Alfred Szwarc Brazilian Ministry of Science and Technology

Autonomous Energy

bagasse

The sugarcane industry produces its own thermal & electric energy using bagasse as a fuel in co-generation systems and it sells the excess electricity to the public grid (presently 600 MW)

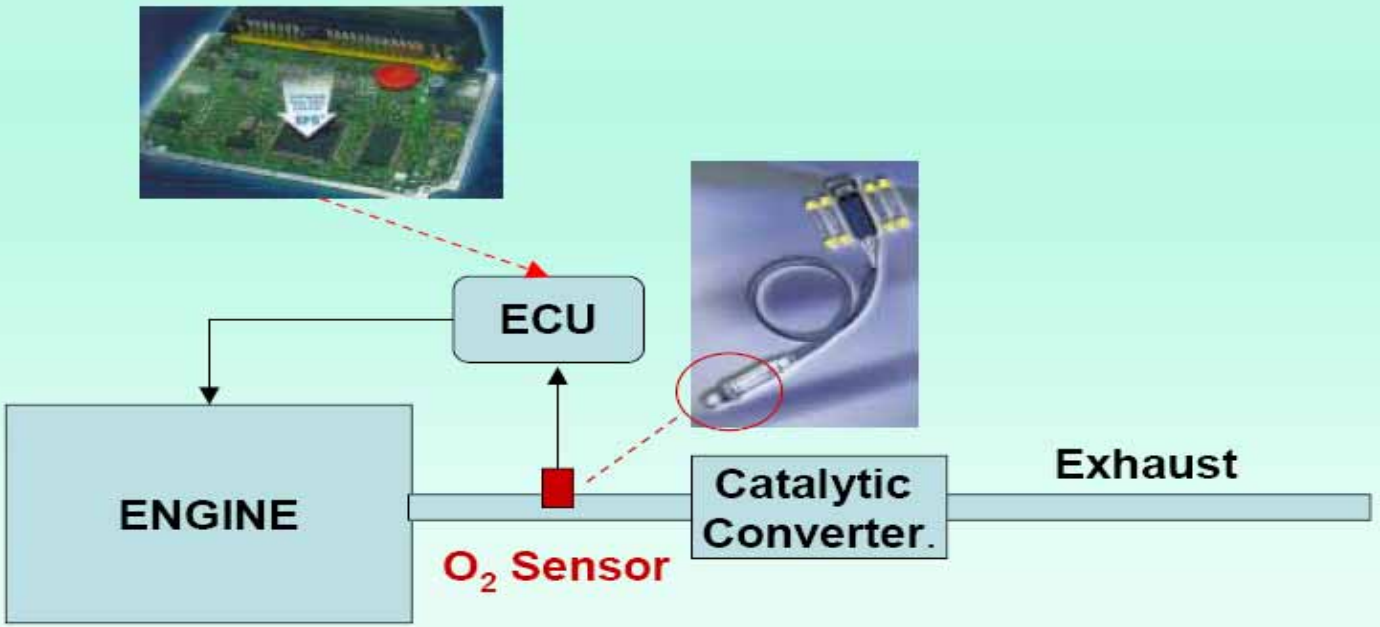
electricity

Source: UNICA

Source: Alfred Szwarc Brazilian Ministry of Science and Technology

The FLEX FUEL Concept

Sensor originally used for emission control measures O_2 content in exhaust gas and sends a signal to the Engine Control Unit (ECU) indicating the level of ethanol in the fuel line → ECU automatically recalibrates spark timing and fuel injection.



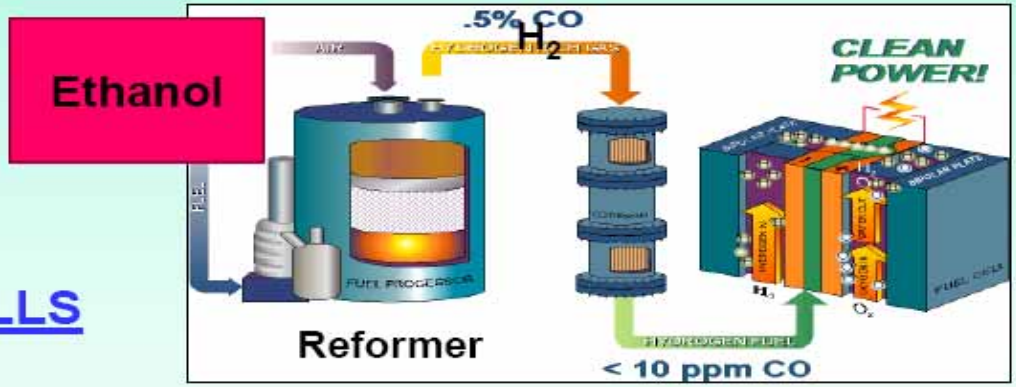
Source: Alfred Szwarc Brazilian Ministry of Science and Technology

New Uses for Ethanol

DIESEL-ETHANOL BLENDS
(Pilot Tests)

Truck operating with diesel + 7% ethanol

SOURCE TO PRODUCE HYDROGEN FOR FUEL CELLS
(Research Level)



Source: Alfred Szwarc Brazilian Ministry of Science and Technology

New Uses for Ethanol: 100% Renewable Biodiesel

Vegetable Oils + Anhydrous Ethanol = Renewable Biodiesel

transesterification

ETHYL ESTER

SOY BEAN

OR → PEANUTS, SUNFLOWER, CORN, COTTON, PALM TREE.....ETC.

+

SUGAR CANE

Source: Alfred Szwarc Brazilian Ministry of Science and Technology

Vegetable Oil Productivity in Brazil

Soybean oil
(18-21%)
400Kg/ha

Sunflower oil
(45-55%)
800Kg/ha

Peanut oil
(40-50%)
900Kg/ha

Castor oil
(45-55%)
1200Kg/ha

Palm oil (Dendê)

(35-45%)

5900 Kg/ha

Note: values in % indicate oil content of each feedstock

Source: LADETEL/USP - ABIOVE

Source: Alfred Szwarc Brazilian Ministry of Science and Technology

BIODIESEL – Environmental Aspects

- Biodegradable
- Reduces emission of:
  - Particulates
  - Carbon Monoxide
  - Sulphur oxides
  - Hydrocarbons
  - CO_2

Benefit is proportional to the amount of biodiesel used

Soybean biodiesel energy balance
3.2 output energy/input fossil energy
For diesel oil the ratio is 0.83

On a well-to-wheel basis it is estimated that:

biodiesel reduces CO_2 emissions by 78% compared to diesel oil

Source: NREL 1998

Source: Alfred Szwarc Brazilian Ministry of Science and Technology

Thank You

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