Peak oil, climate change and energy transition in SIDS

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Keron Niles

Menu

- Peak Oil
- Climate change
- Consequences for SIDS
- Power sector reform post 1970s
  Keron's thesis

- Conclusions – what needs to be done

Marion King Hubbert: 1949 Science

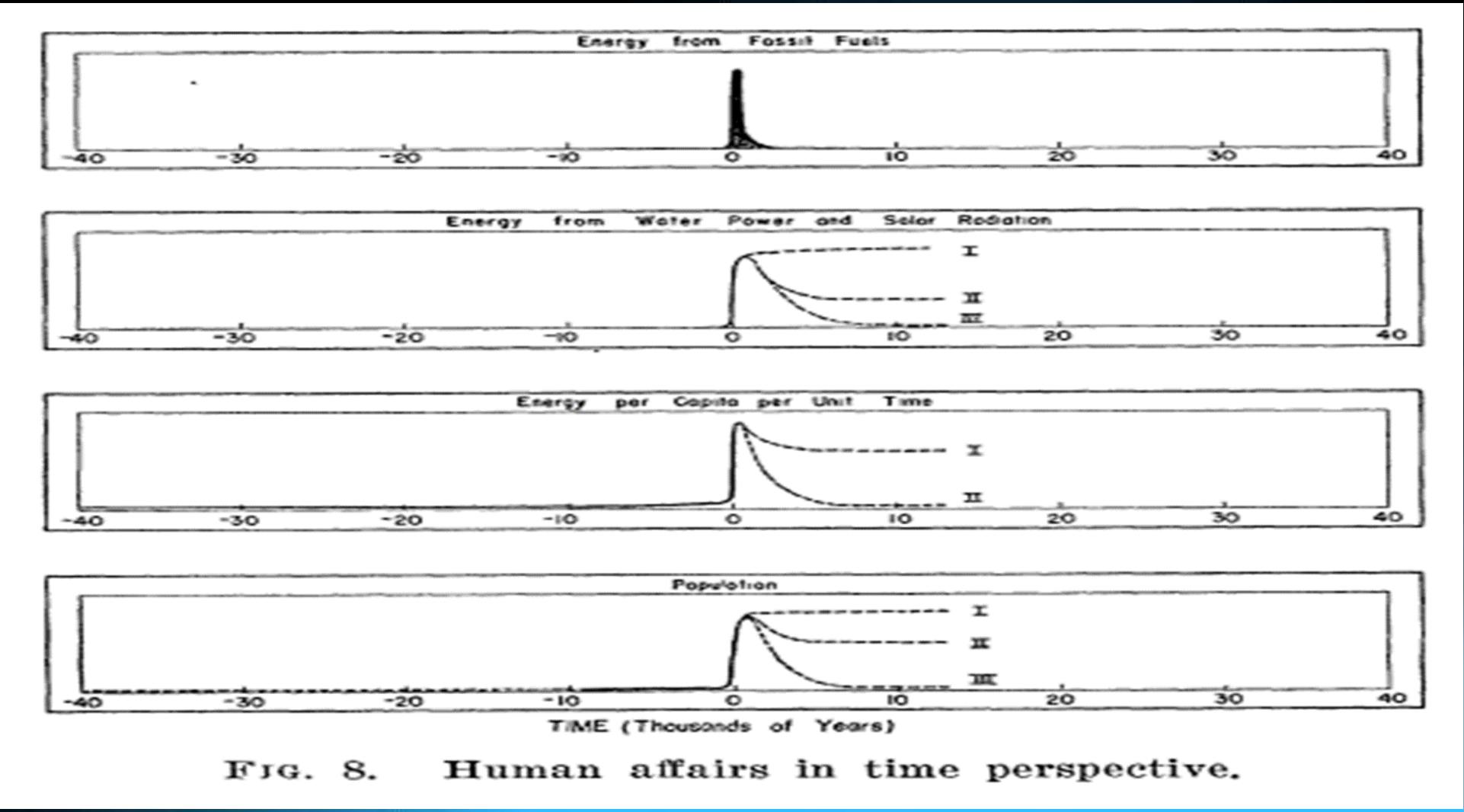
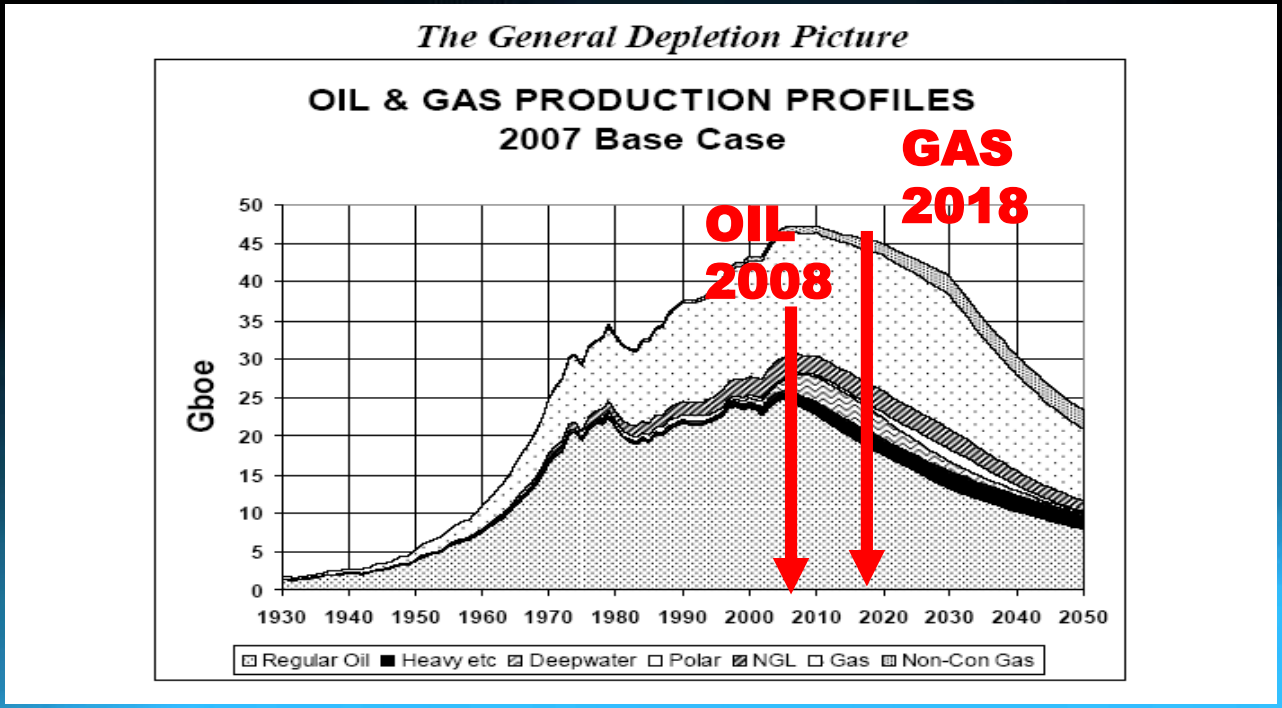


FIG. 8. Human affairs in time perspective.

PEAK OIL - Colin Campbell's scenario puts peak oil (all liquids) at 2008: GAS a decade later in 2018

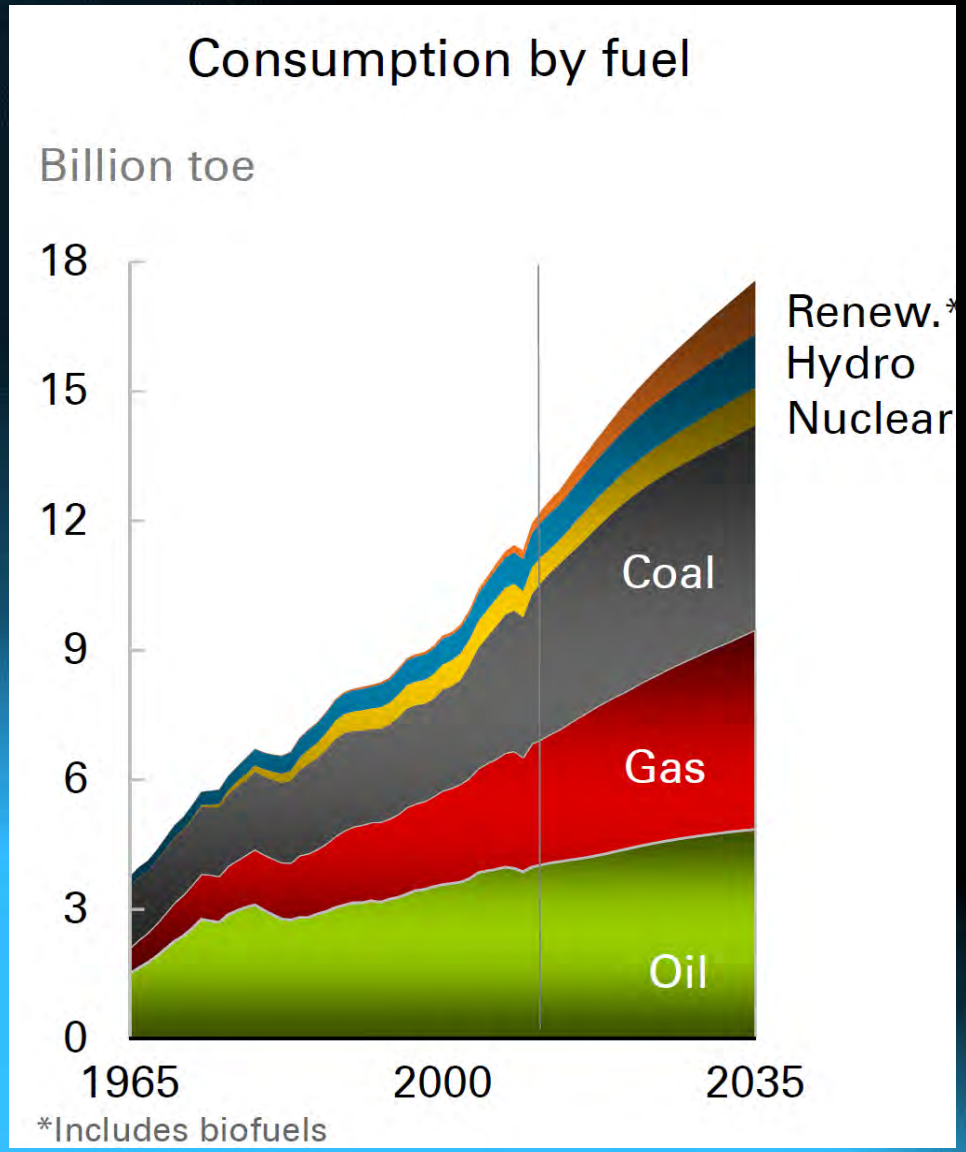


Colin's EUR for conventional oil = 1.9T bbls All liquids 2.5T bbls

Peak oil debunked (FRACKING)

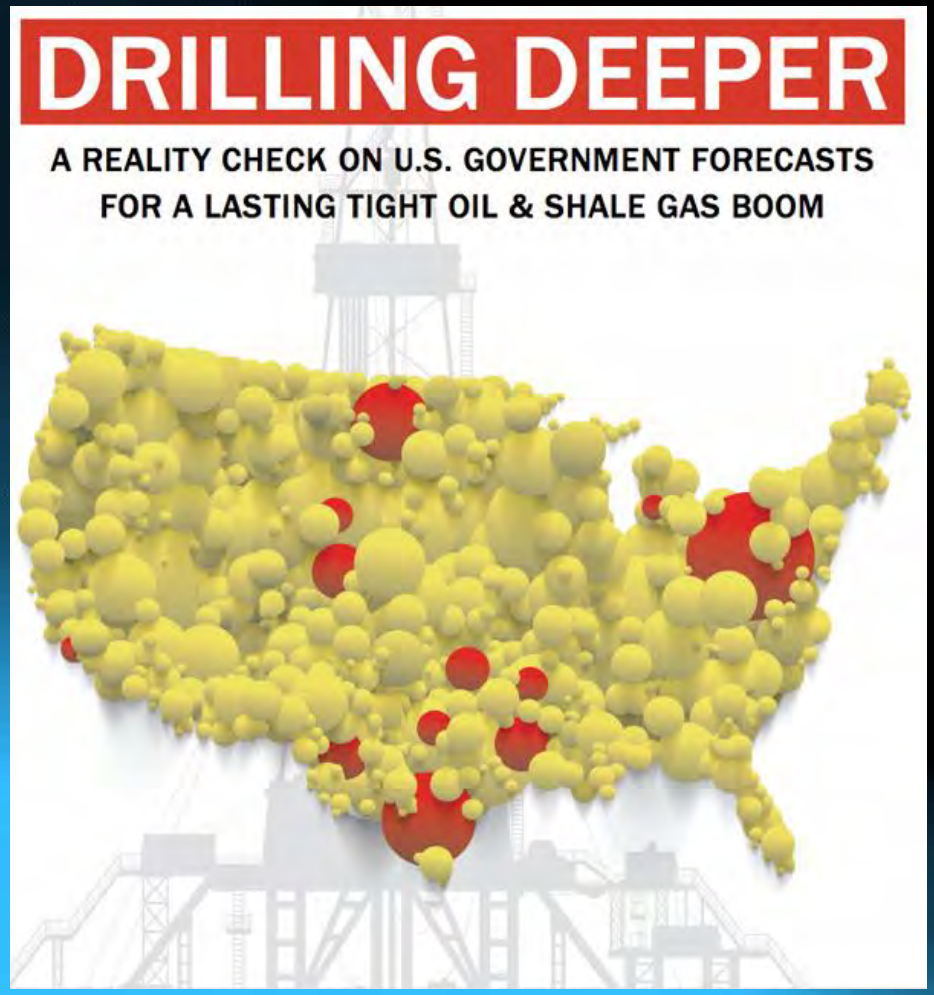
- Wall Street Journal (2011) "There Will Be Oil" says Daniel Yergin.

"For decades, advocates of 'peak oil' have been predicting a crisis in energy supplies. They've been wrong at every turn"



Debunking debunked: Post Carbon Institute David Hughes Oct 27th 2014

- By 2040, production rates from the Bakken and Eagle Ford will be less than a tenth of that projected by the Energy Department.
- US tight oil production will peak by 2020



Global consequences of Peak Oil

- Reducing liquid fuel supply
- Higher unemployment
- Social unrest
- Resource nationalism
- Geopolitical instability and a rush to secure remaining supplies Interstate conflict is now #1 in the latest WEF risk analysis
- Greater emphasis on security of supply over climate change

UK Govt report obtained under FOIA June 2011

The Impacts of Peak Oil

... peak oil's effects on the economy would not be limited to higher oil prices – there could be a number of other potentially significant impacts on the economy ...

ENERGY & CLIMATE CHANGE

In exploring the potential impact of peak oil on the UK we need to consider both the direct and indirect impact on the UK economy resulting from changes in oil prices and supply pressures as well as the short term versus the long term impacts.

The short term versus the long term impacts are outlined below. If we consider the direct and indirect impacts, the direct impacts are more likely to be channelled through economic variables such as inflation, output, current account of balance of payments and tax revenues, whereas the indirect impact will arise as a result of economic and political reactions of other countries' to changes in the oil price and supply pressures.

Price rise

Short term impacts

Immediate impacts

- Transfer of income from importing to exporting countries
- Deterioration in balance of payments for net oil importers

Longer-term impacts

Short- & medium-term impacts

- Higher inflation
- Increased input costs (transport, industry)
- Reduced non-oil demand (because of higher prices for goods)
- Potentially reduced oil demand and consumption
- Lower investment in net oil-importing countries
- Upward pressure on wages
- Higher unemployment
- Consumer and business confidence falls
- Downward pressure on GDP
- Tax revenues fall
- Falling exports due to economic impacts in our main export markets

Other impacts

Other possible impacts

- Social unrest
- Resource nationalism
- Increased geopolitical competition for resources/supplies possibly leading to an increase in long-term supply contracts
- Greater emphasis of security of supply over climate change objectives

Climate change

- Physical effects
- Economic effects
- Social effects: Human migration to escape both above
- Forced restrictions on fossil fuel consumption

IPCC Chapt 6 – WGIII mitigation
Scenario RCP2.6 is the only one to keep below 2 degrees with 66% probability

Fig 6.4

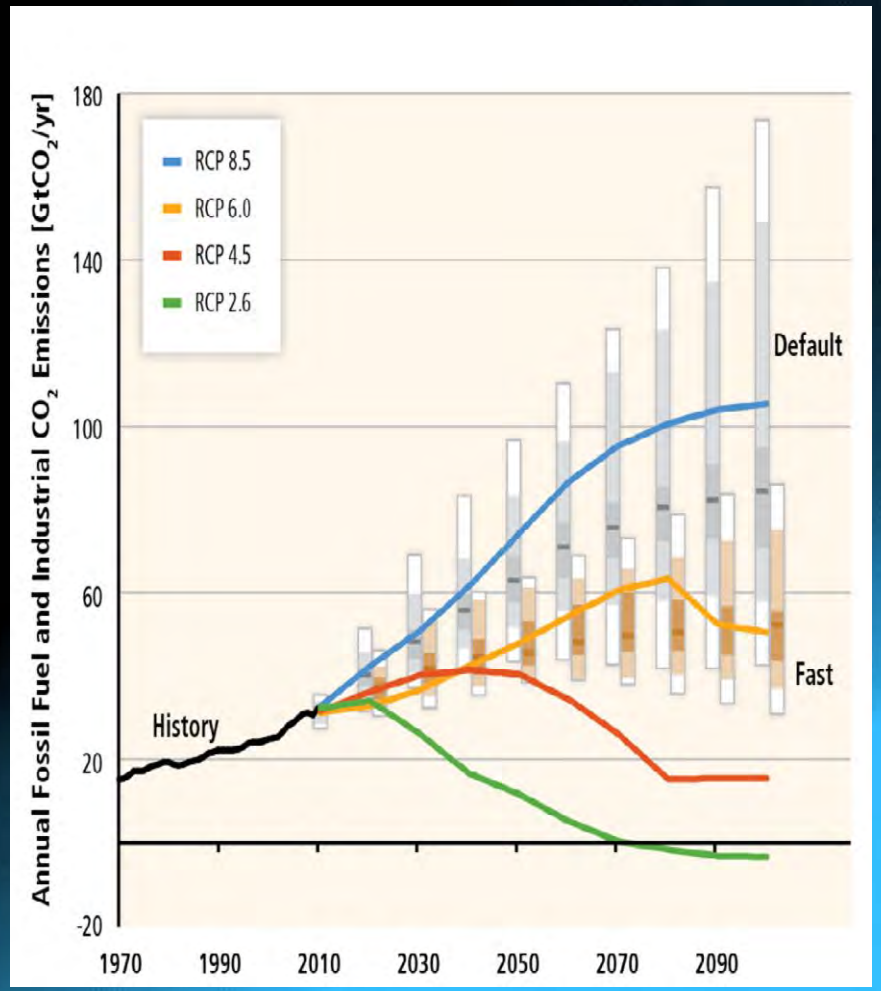
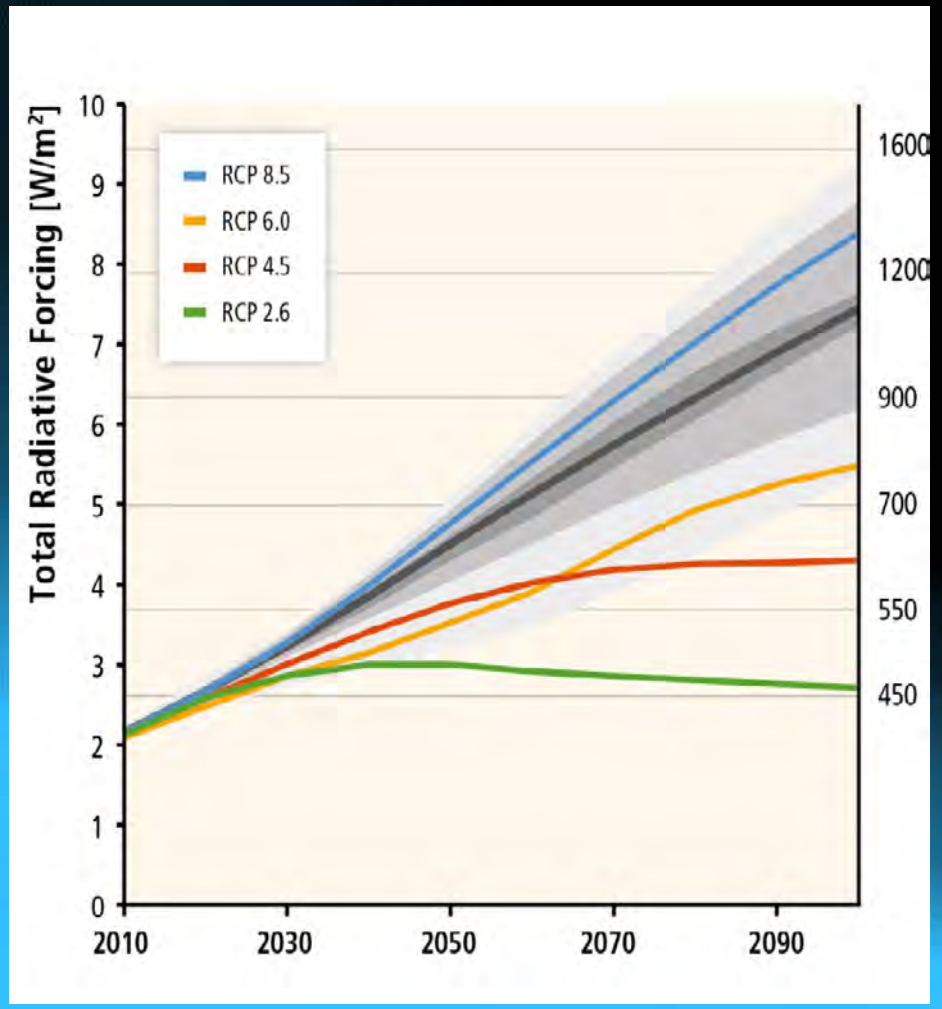
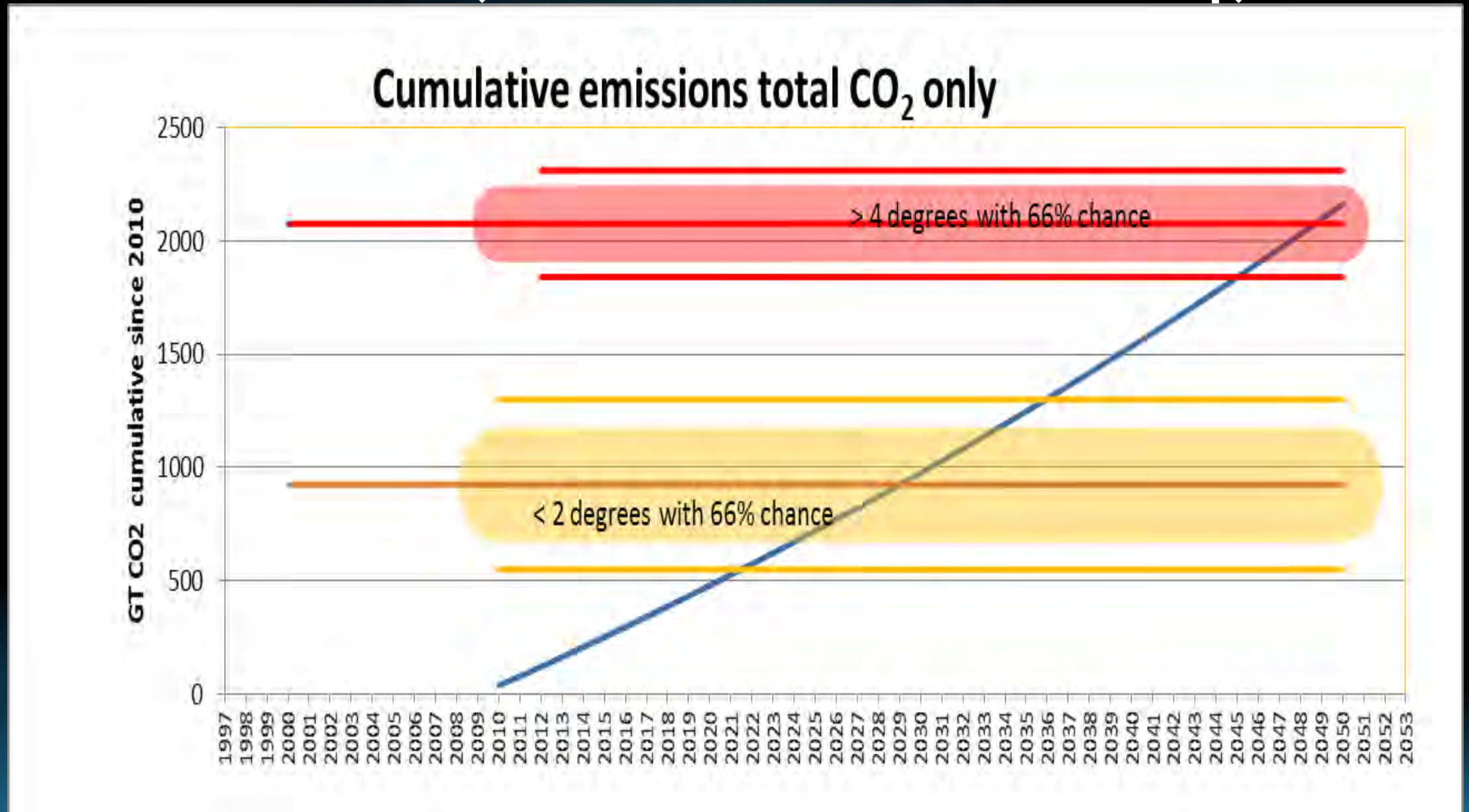


Fig 6.6

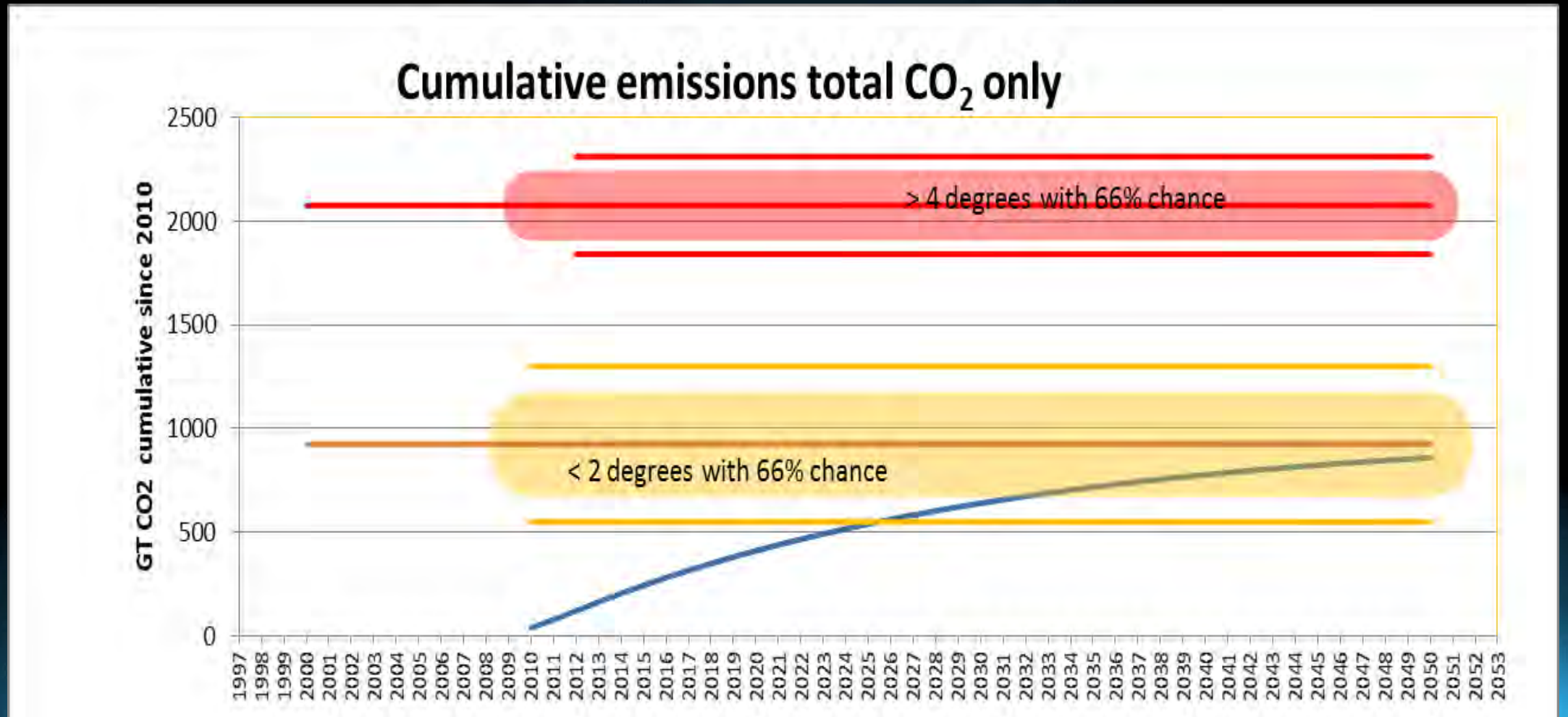
ppm



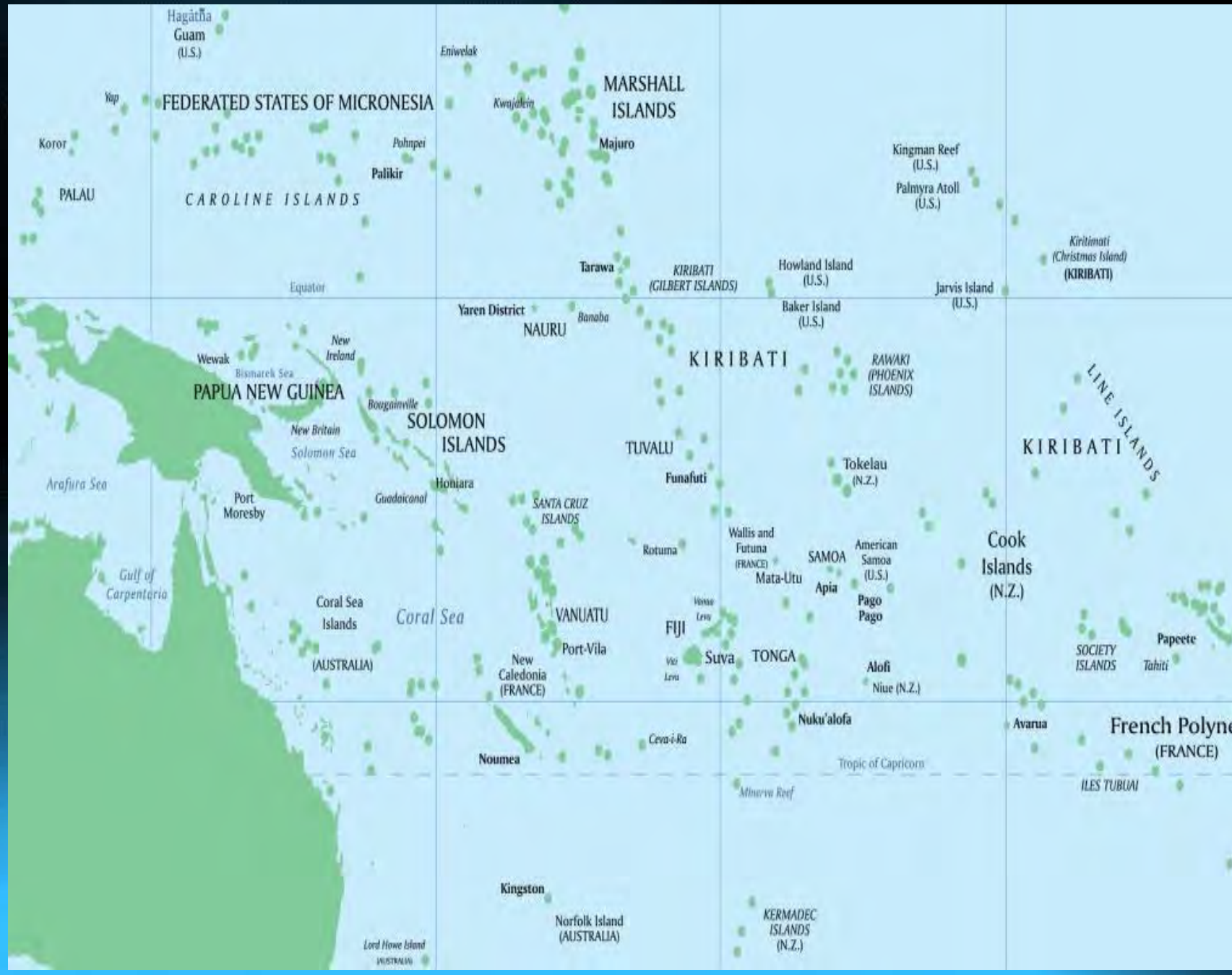
With BAU (BP estimates 2014)



To keep below 2 degrees global oil coal and gas will all have to decrease by at around 5% pa from 2015



Now to SIDS


Hagåtña
Guam
(U.S.)
Eniwetak
Yap
FEDERATED STATES OF MICRONESIA
Kwajalein
MARSHALL ISLANDS
Koror
Pohnpei
Majuro
Palikir
PALAU
CAROLINE ISLANDS
Kingman Reef
(U.S.)
Palmyra Atoll
(U.S.)
Kiritimati
(Christmas Island)
(KIRIBATI)
Tarawa
KIRIBATI
(GILBERT ISLANDS)
Howland Island
(U.S.)
Jarvis Island
(U.S.)
Equator
Yaren District
NAURU
Banaba
Baker Island
(U.S.)
New Ireland
Wewak
KIRIBATI
RAWAKI
(PHOENIX
ISLANDS)
Bismarck Sea
PAPUA NEW GUINEA
Bougainville
LINE ISLANDS
SOLOMON ISLANDS
New Britain
Solomon Sea
TUVALU
KIRIBATI
Arafura Sea
Honiara
Funafuti
Tokelau
(N.Z.)
Port Moresby
Guadalcanal
SANTA CRUZ ISLANDS
Rotuma
Wallis and Futuna
(FRANCE)
SAMOA
American Samoa
(U.S.)
Mata-Utu
Apia
Cook Islands
(N.Z.)
Gulf of Carpentaria
Coral Sea Islands
(AUSTRALIA)
Coral Sea
VANUATU
Pago Pago
FIJI
Port-Vila
Suva
TONGA
SOCIETY ISLANDS
Papeete
Tahiti
New Caledonia
(FRANCE)
Alofi
Niue (N.Z.)
Nuku'alofa
Avarua
French Polyne
(FRANCE)
Noumea
Ceva-i-Ra
Tropic of Capricorn
Minerva Reef
ILES TUBUAI
Kingston
Norfolk Island
(AUSTRALIA)
KERMADEC ISLANDS
(N.Z.)
Lord Howe Island

Traditional energy sources were completely sustainable

- Biomass (cooking heating)
- Food
- Wind (sailing)
- Human energy

Then came the Europeans and the emphasis moved to economic development and export of produce.

This meant a change in energy supply

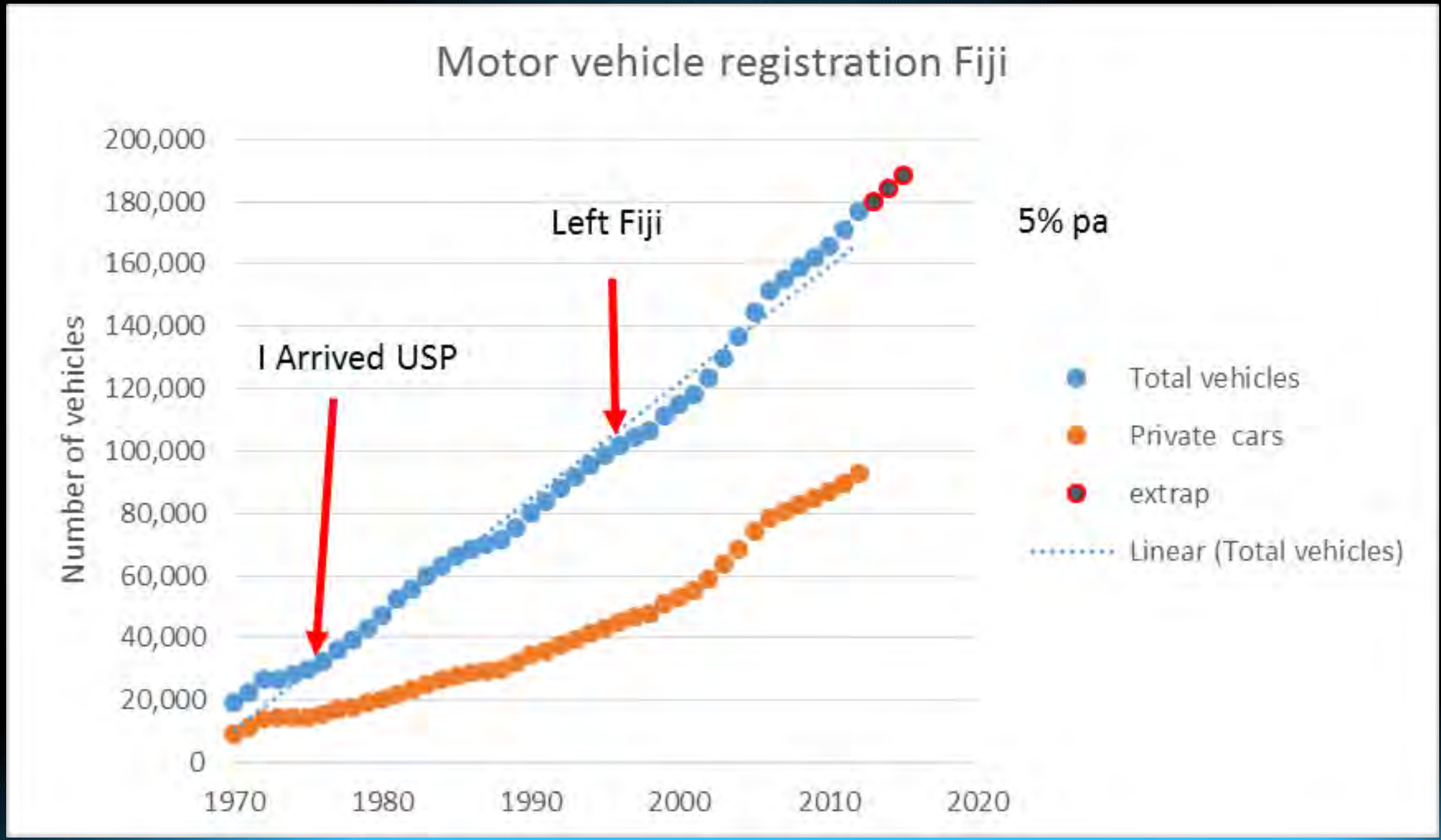
- Diesel and other liquid fuels
- Small diesel electric systems
- Imported labour
- Small hydro
- On the demand side: motor cars, shipping air transport, air conditioning, tourist hotels etc

Today SIDS range from being very poor low carbon emitters to relatively rich, high carbon emitters

- Trinidad Tobago: 2nd highest in the world at nearly 40 tonnes per capita
- Vanuatu, Solomons, PNG, Kiribati around 0.5 tonnes per capita
- Fiji 1.5- 2 tonnes per capita

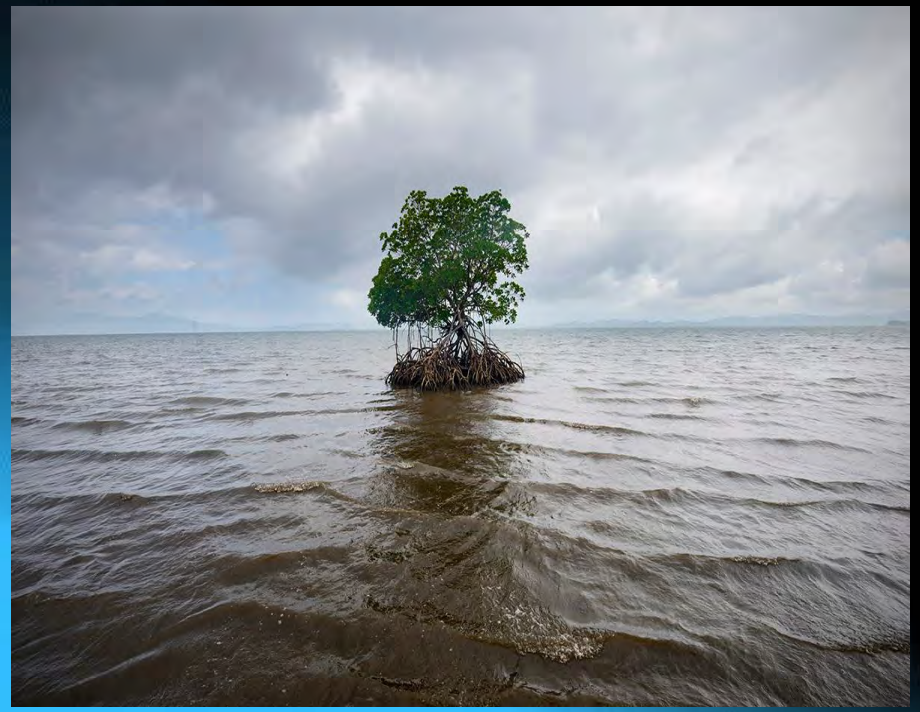
SIDS Effect of Peak Oil

- Reducing liquid fuel supply will affect both transport and electricity sectors
- Transport problems will affect the richer SIDS disproportionately. Eg Fiji # vehicles
- Increased cost of electricity generation will affect all the countries that rely on diesel generation in a replay of the 1970s
- Declining world economy and economic instability will make aid transfers less likely
- World geopolitical instability will exacerbate ability of donor countries to focus on aid and in addition disrupt technology transfer


Motor vehicle registration Fiji
Number of vehicles
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1970
1980
1990
2000
2010
2020
I Arrived USP
Left Fiji
5% pa
Total vehicles
Private cars
extrap
Linear (Total vehicles)

SIDS Effects of Climate Change: physical

- Sea level rise will make it difficult to put in place long lasting projects and waste capital.
- Adverse weather events and increasing temperatures will drain local economies and also cause problems with RE projects
- Eventually for some SIDS migration will be the only option.



Climate change: economic effects

- World economic problems will again make aid transfers less likely and eventually curtail rich country imports of primary produce from SIDS

- Economic problems and eventual forced restrictions on fossil fuel supplies will curtail tourism

- World migration flows from populous areas (Africa and Asia will cause recipient developed countries to close borders

Development trumps environment and resilience

- During the 1980s onwards with the world moving towards economic rationalisation and economic efficiency, many SIDS were forced to restructure to obtain development assistance.
- The result was that economic efficiency supplanted any desire of SIDS to transition to sustainable and environmentally friendly energy supplies.

Power sector reform

- Power sector reform post 1970 and in particular post 1976 (oil crisis) should have been used as an opportunity to transition to RE. Keron Niles in his PhD thesis.
- The expected transition mostly did not occur
- Why?
- Problems in the RE sector particularly PV
- The concurrent decline in oil prices post 1980s meant the transition at the time was uneconomic.

What needs to be done?

- Increase supply resilience in terms of future weather events
- Lessen influence of economic efficiency on aid transfers.
- No unproven technologies
- Improve human resource capacity including reduce migration of qualified personnel, increase wages of key technical people
- Make sure local repair and maintenance capability is a key part of any hardware project eg Bushlight project Australia

What needs to be done?

- External costs(environmental) need to be internalised.
- Carbon taxes need to be put in place to discourage use of fossil fuels. E.g. raise the price of liquid fuels and motor vehicles encourage public transport. Raise the price of electricity.
- Increase subsidies for RE using revenue from carbon taxes

BUT Problems! Last word to Keron

Just three weeks ago at a talk at Otago. Keron said his student aspirations when on the ground in a Trinidad - Tobago Government Department responsible for economic development met blank stares and disbelief regarding any suggestion of RE deployment in his country and particularly for Peak Oil.

The feeling was that curtailing economic development was just not negotiable

Last word to Tony Abbot