

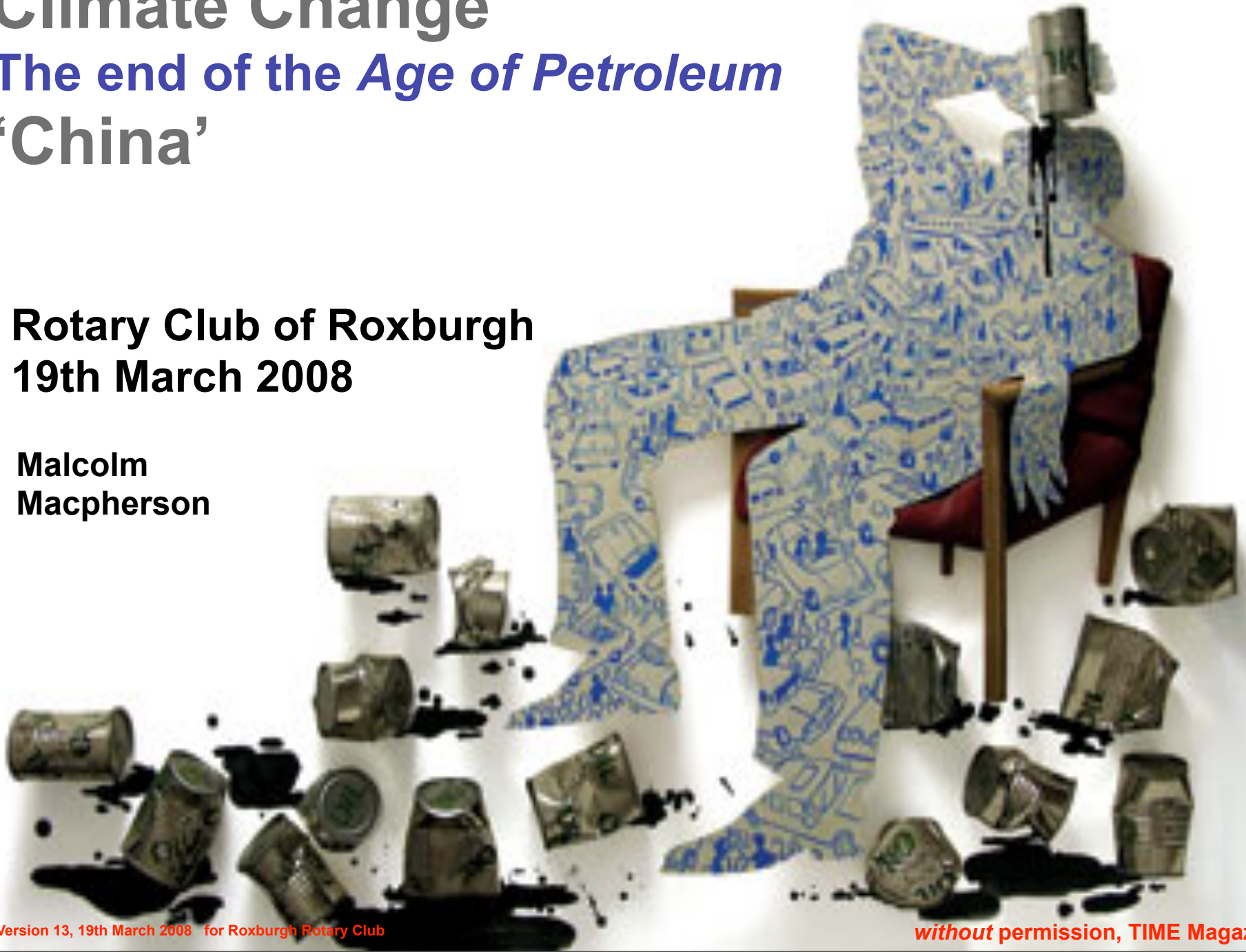
Climate Change

The end of the *Age of Petroleum*

'China'

**Rotary Club of Roxburgh
19th March 2008**

**Malcolm
Macpherson**



Climate change

The science is good enough to act on – not perfect, but good enough. Time to stop arguing the fine points, and about who caused it, and to start dealing with it

Even if we called a halt now, a 2 degree rise is inevitable

and also

The end of the Age of Petroleum

The science is even better!

Its already here folks! In a thousand years from now, people will talk about ‘before and after the age of petroleum’

and also

‘China’

The biggest opportunity since ... the last gold seekers?

Climate change

**New Zealand is 0.3% of the problem
so mitigation is not us**

“New Zealand contributes 0.3% of total greenhouse gasses. If we got rid of all of our cows, and most of our sheep, and relied only on hydro power, we might reduce that to 0.15%

“We’d also, by the way, reduce our standard of living to that of Haiti

“Brave, principled, or just plain stupid?

Peak Oil

... is what?

We're using oil faster than we're finding it
Few mega-fields left un-discovered
Reserves probably over-estimated

Little doubt about prognosis

Long, inevitable decline in availability

Unpredictable, inevitable increase in price

Peak Oil

New Zealand affected first and worst

at the end of

The world's longest supply chains

subject to

***A just-in-time* world economy with very little inventory**

with ... **no bargaining power**

and no strategic relevance

The last time oil was at (inflation-adjusted) **\$100?**
April 1980

Demand is now 60% higher

In 1980 President Jimmy Carter said:

“Our excessive dependence on foreign oil is a clear and present danger to our nation’s security”

The USA then, the world today!

Since the last time we saw \$100 oil, the US economy has become twice as efficient ... can we become twice as efficient again?

“This is a test of consumers, of government policies and of the pace and breadth of our ability to innovate.”

Daniel Yergin

Chairman, Cambridge Energy Research Associates

Quoted in **TIME**, 19th November 2007

So, to repeat, the arguments about climate change and peak oil are over before they've begun

both are here already, and our response should be to focus on adaptation

– we can't mitigate – nothing we can do will stop them happening – and at 0.3% of the problem, shouldn't even try

strategy that doesn't account for climate change, peak oil and 'China' is seriously missing the point

First and worst, yes ...

**but best endowed
to adapt successfully**

'best endowed ...'

Means what?

*World's cheapest protein
renewable energy*

*clean and green (ish)
but easily organic-able*

solid fuel rich (in extremis)

**‘... adapt successfully’
How and to what?**

Key insight

**this is not just about
climate and oil**

***Our 21st Century is going to be marked by
great wealth and an economic impact far
beyond our size or population***

An early-century synopsis

Adverse weather

more extremes, less predictability, shifting zones – will affect most of the world

Petroleum will become very expensive

sooner than we think, and there may be a period of supply and price volatility while the geopolitics sorts itself out

There will be an explosion of innovation

in the emergent nations especially India and China (*cf* WW2)

The world will find ways to be sustainable very quickly

much faster than the 100-years-ago transition from the horse to the automobile

... an explosion in innovation

Engineering graduates

860,000 per year in India and China

215,000 (India), 644,000 (China)

vs 222,000 in the USA

... **China is racing ahead of the United States and India in its production of engineering and technology PhDs and in its ability to perform basic research**

Vivek Wadhwa, Duke University Executive in Residence
China leads the other two countries in master's and doctoral degrees

New Zealand's 21st Century will be characterised by great wealth

(but also rapid change, unpredictability, and geopolitical instability)

Because

The grass-fed economies – New Zealand and Ireland – will experience a prolonged **structural (NOT cyclical)** boom, for all 'grass-fed' protein – dairy today, meat and wool (and ...) tomorrow

Why?

World economy grew 4.75% in 2006
fastest for over 30 years

China population **1.3b** GDP growth **9.9%**

India population **1.1b** GDP growth **7.6%**

Vietnam population **0.85b** GDP growth **7.6%**

liberalisation of previously centrally-planned economies

Why #2

China

in 1984	1/14 th the size of the US economy
in 2005	1/6 th
by 2030	> the US economy

2010 250m middle class Chinese

In 2005 China used 54% of the world's cement

China is settling 500m people in new or expanded cities over a 20 year period – 2.5 Londons every year

Unprecedented in world history

Why #3

Cheap grain is history

World corn inventory lowest for 30 years

Demand for grain has outpaced supply for the last 6 years

This year alone prices for corn up 75%, wheat up 50%

Why? Ethanol, water, draught, other competing land-uses
(the first indicator of the end of the age of petroleum)

Grain is essential for protein production in most of the developed world – **a well-fed US cow eats 4 tonnes of grain per year, 62% of her diet.** A well-fed Irish cow eats 5%

A well-fed NZ cow? **Virtually none**

**New Zealand,
and especially Central Otago**

In the sweet spot!

How come?

So: adaptation to what?

However much of that synopsis is true, there's no doubt that great change is on the way

... and that NZ 'first and worst' is a reasonable assumption

But we don't have a very clear idea about what it will mean, for us

So what's a prudent response?

Community resilience

community planning
devolution
subsidiarity

Local empowerment

An accidentally appropriate response!?

Key message for local government

Focus on the enablers of adaptation

Water

invest in conservation and innovative uses

Landuse

don't compromise primary production, because that's our future

Habitation patterns

stay close, build in and up, but not **out**, because transport is going to become very expensive

Transport

don't misspend on unnecessary networks
properly resource public transport

Diversity

eschew monocultures (human and agrarian)

Energy and renewables

hydro, wind, solar

A low-cost *renewables-based* economy
will have sustainable economic resilience