

GROWTH._£
TRANSITION

GROWTH._£
TRANSITION



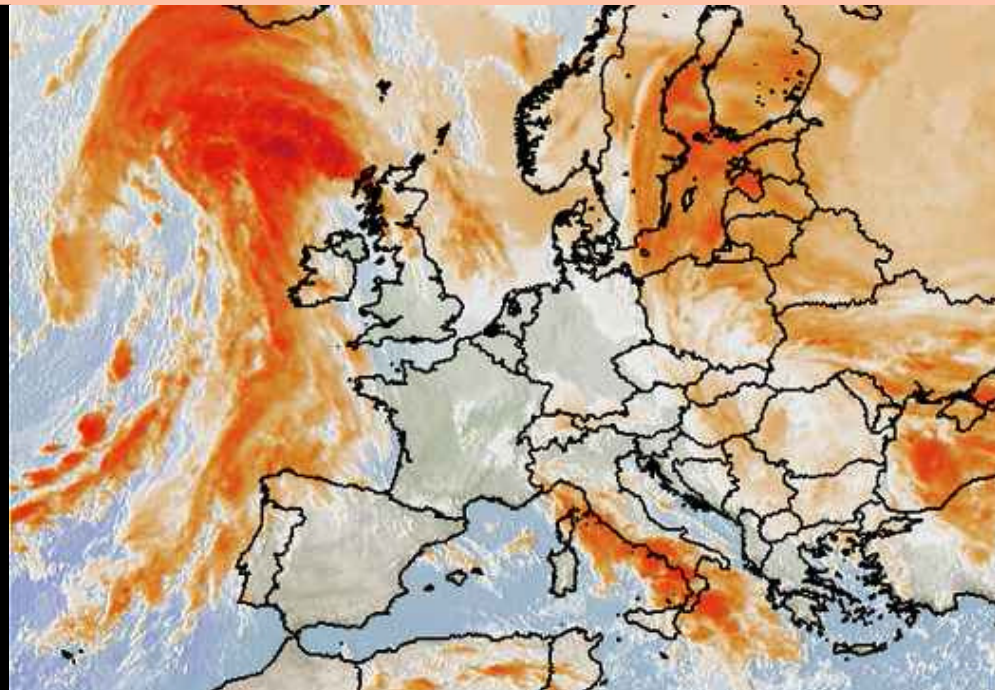
ASPO Australia
Australian Association for the Study of Peak Oil and Gas

Peak Oil

Oil shortages will soon pose a significant problem for transition

Bruce Robinson, Convenor

**Look out Europe !!
Something serious is
looming on the radar**





ASPO Australia

Australian Association for the Study of Peak Oil and Gas

www.ASPO-Australia.org.au

An Australia-wide network of professionals working to reduce oil vulnerability

Working groups

Urban and transport planning

Finance Sector

Health Sector

Social Services Sector

Regional and city

Remote indigenous communities

Active transport (bicycle & walking)

Agriculture, Fisheries and Food

Biofuels

Oil & Gas industry

Construction Industry

Public transport sector

Defence and Security

Economics

Tourism

Children and Peak Oil

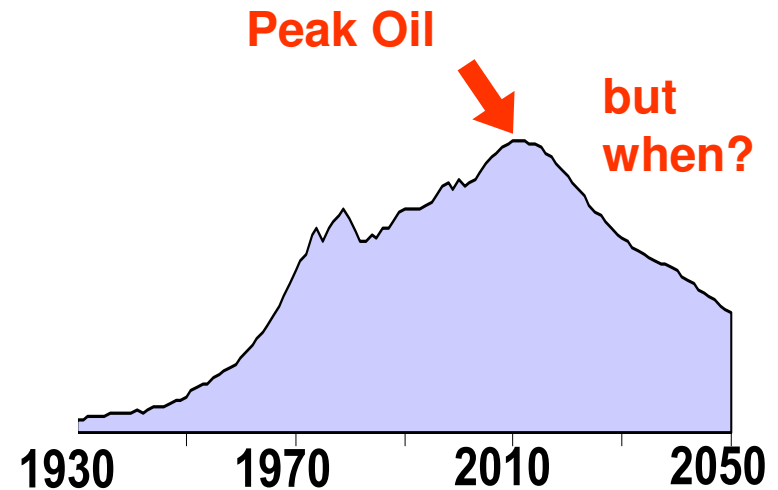
Young Professionals working group



**We are part of the
international
ASPO alliance,
based in Uppsala, Sweden**

Outline

This is about Oil, not energy in general.
Transport Energy (largely)
Global oil supply, not just Europe's
It is not about Climate Change



- What is Peak Oil ?

the time when global oil production stops rising and starts its final decline
We will never "run out of oil"

- Peak Oil will probably hit Europe sooner and harder than climate change
- When is the most probable forecast date ? *? 2012 +/- 5 years*
- “Peak Exports” will arrive sooner, as exporting countries use more of their own oil internally, leaving less for export
- Governments and communities must consider Peak Oil risks urgently. Oil vulnerability mitigation and adaptation strategies must be devised and implemented.

The Oil Crunch

Securing the UK's energy future

First report of the UK Industry Taskforce on Peak Oil & Energy Security (ITPOES)



**Industry Taskforce
on Peak Oil & Energy Security**

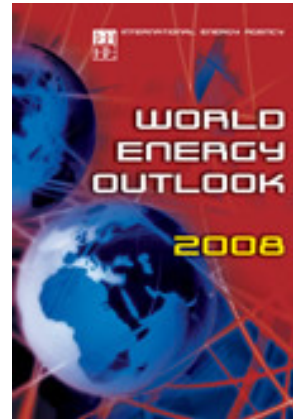


Jeremy Leggett October 29 2008

Time for an energy bail-out

Peak oil is just five years away, and we must start to plan now to avert a truly ruinous crisis

Previously unimaginable policy interventions in financial markets have suddenly become imperative, and similar interventions in energy markets today may be worth their weight in gold tomorrow.



IEA November 2008

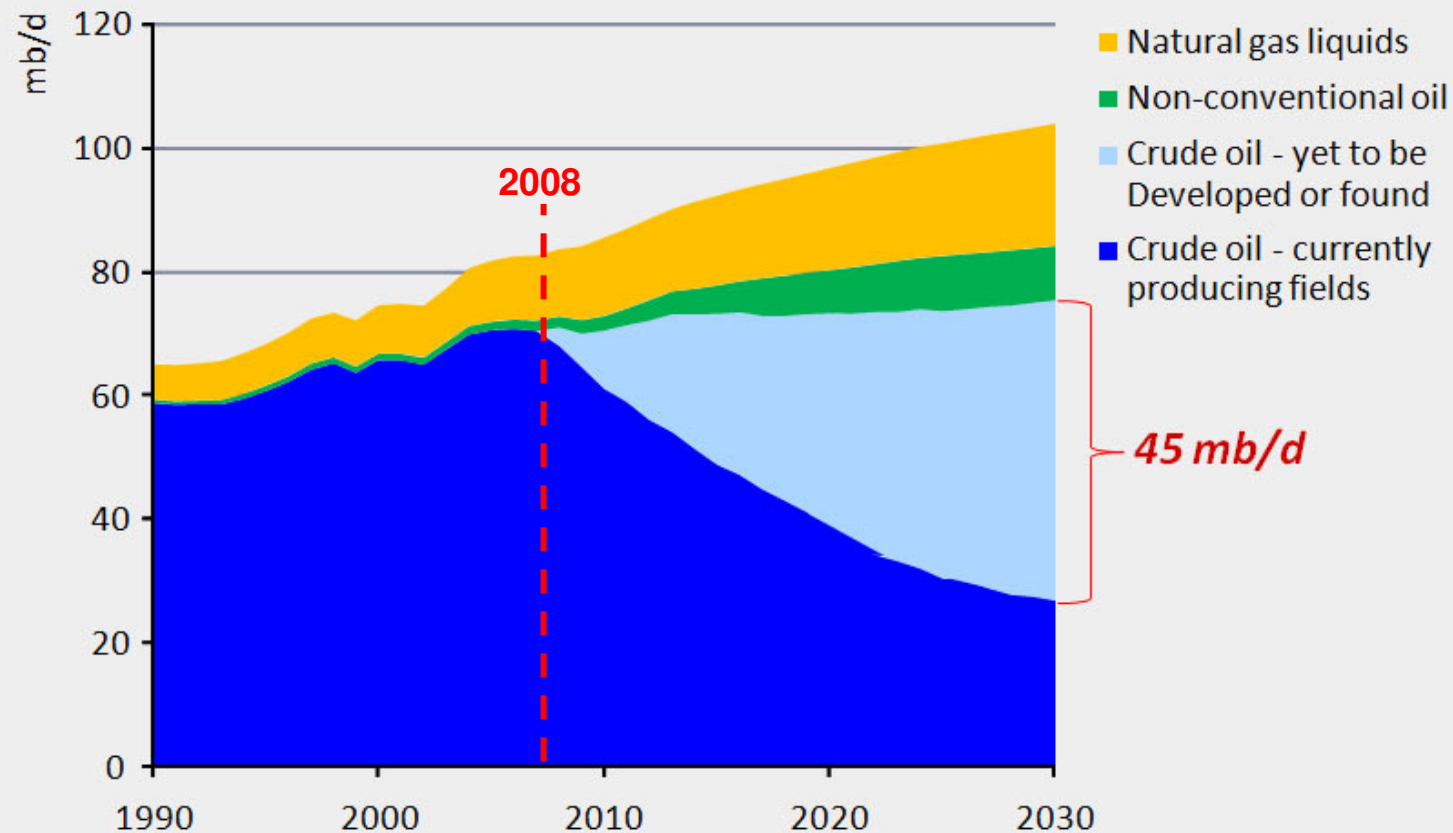
The world is heading for a catastrophic energy crunch that could cripple a global economic recovery because most of the major oil fields in the world have passed their peak production, a leading energy economist has warned. (IEA's Fatih Birol)



The IEA estimates that the average production-weighted observed decline rate worldwide is currently 6.7% pa for fields that have passed their production peak”.

World oil production by source in the Reference Scenario

World
Energy
Outlook
2008



Even if oil demand were to remain flat to 2030, 45 m barrels/day of gross capacity -roughly four times the capacity of Saudi Arabia - would be needed just to offset the decline from existing fields

THE GROWING GAP

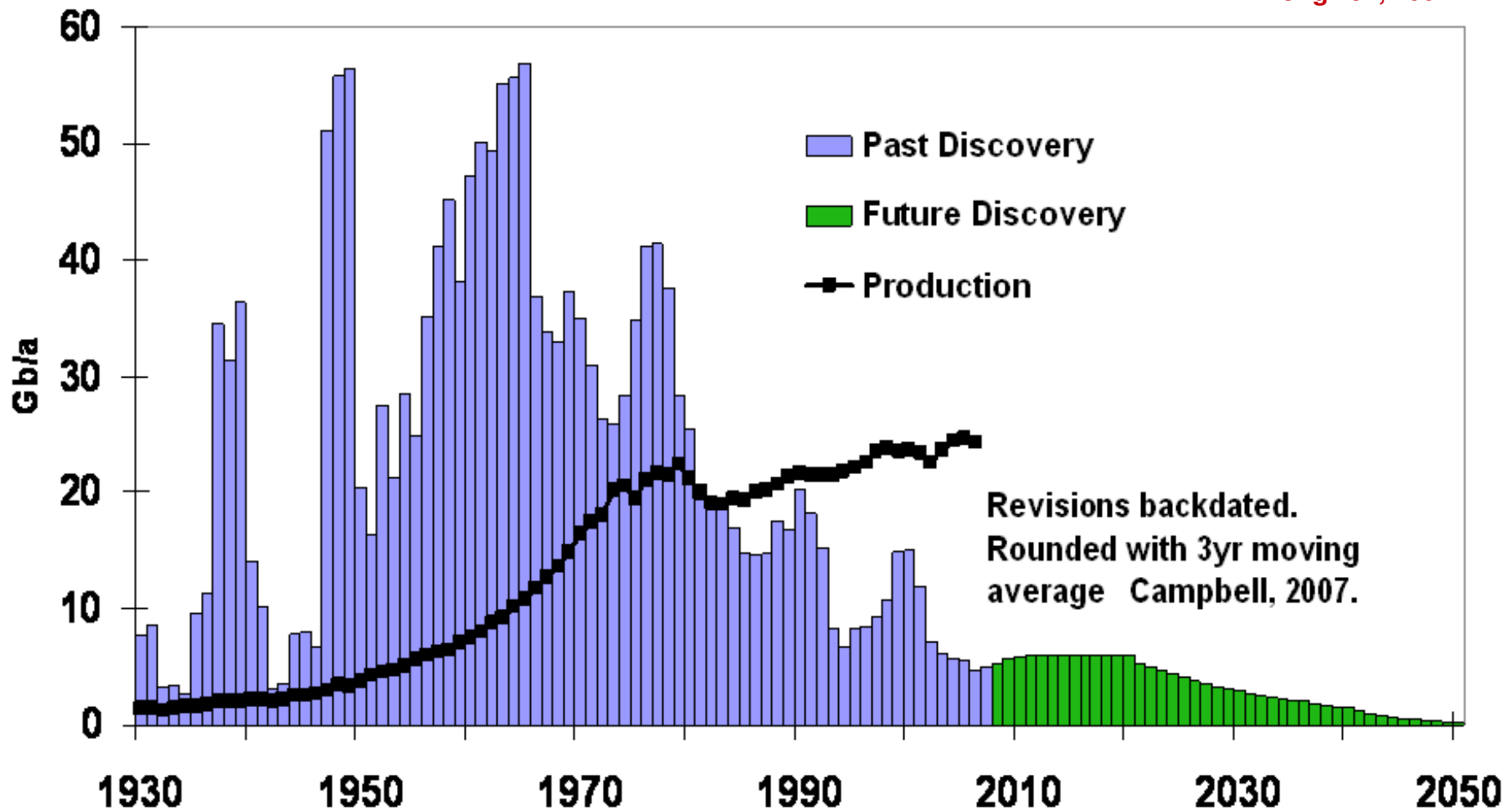
Regular Conventional Oil

Billion barrels of oil per year



ExxonMobil

Longwell, 2002





International Energy Agency
Agence Internationale de l'Énergie

But....

Key oil figures were distorted by US pressure, says whistleblower

Exclusive: Watchdog's estimates of reserves inflated says top official
guardian.co.uk, Monday 9 November 2009

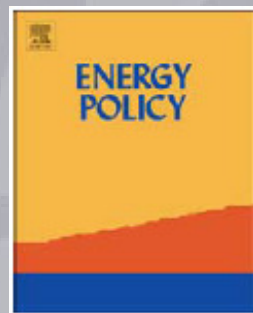
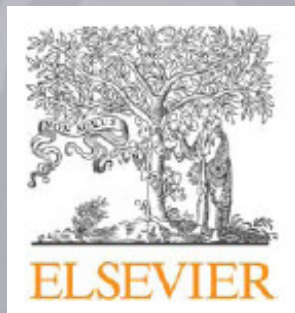
The world is much closer to running short of oil than official estimates admit, according to a whistleblower at the International Energy Agency who claims it has been deliberately underplaying a looming shortage for fear of triggering panic buying.

Prof Kjell Aleklett

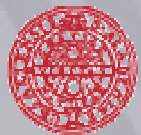
Global Energy Systems
Uppsala University, Sweden

The Peak of the Oil Age -

Analyzing the world oil production Reference Scenario in World Energy Outlook 2008



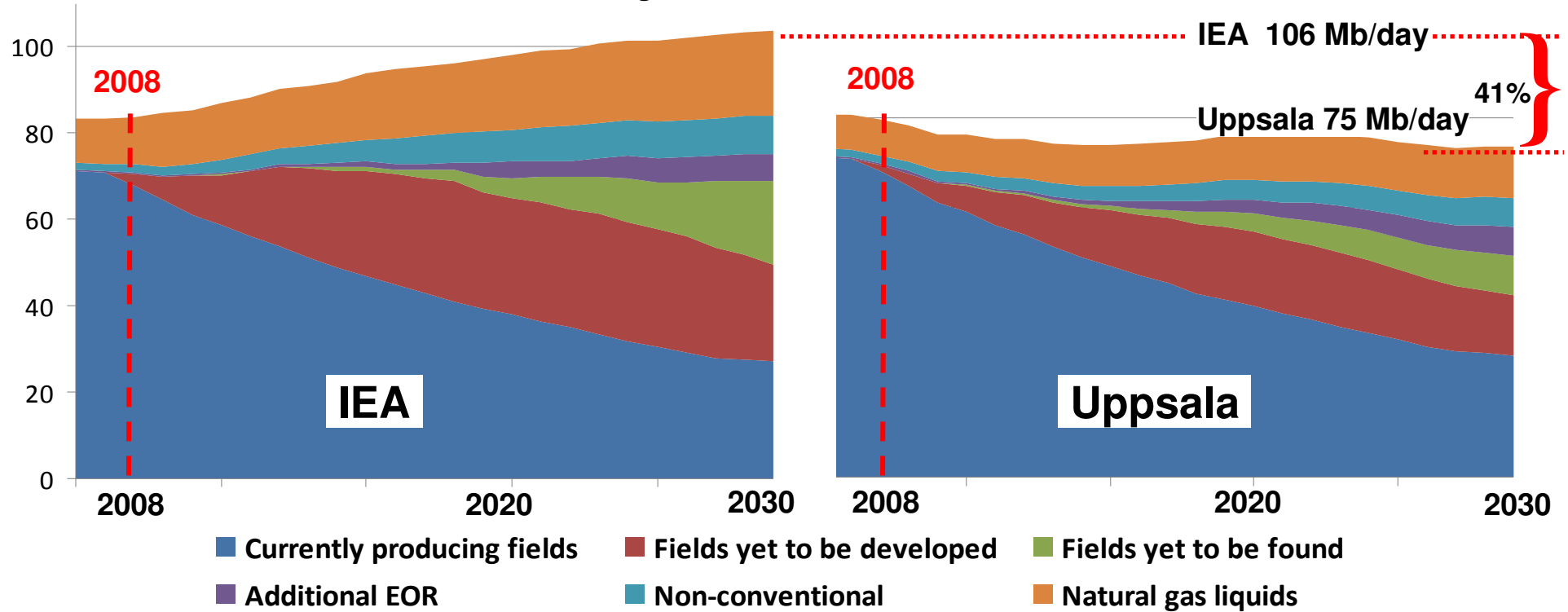
Published in
Energy Policy,
November 2009



UPPSALA
UNIVERSITET



Different World oil production forecasts (million barrels/day)
using the same reserve data

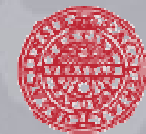


Using the same IEA reserve data

IEA production forecasts are "outside reality", not possible.

(because IEA have assumed impossible production rates from the reserves)

Different conclusions.



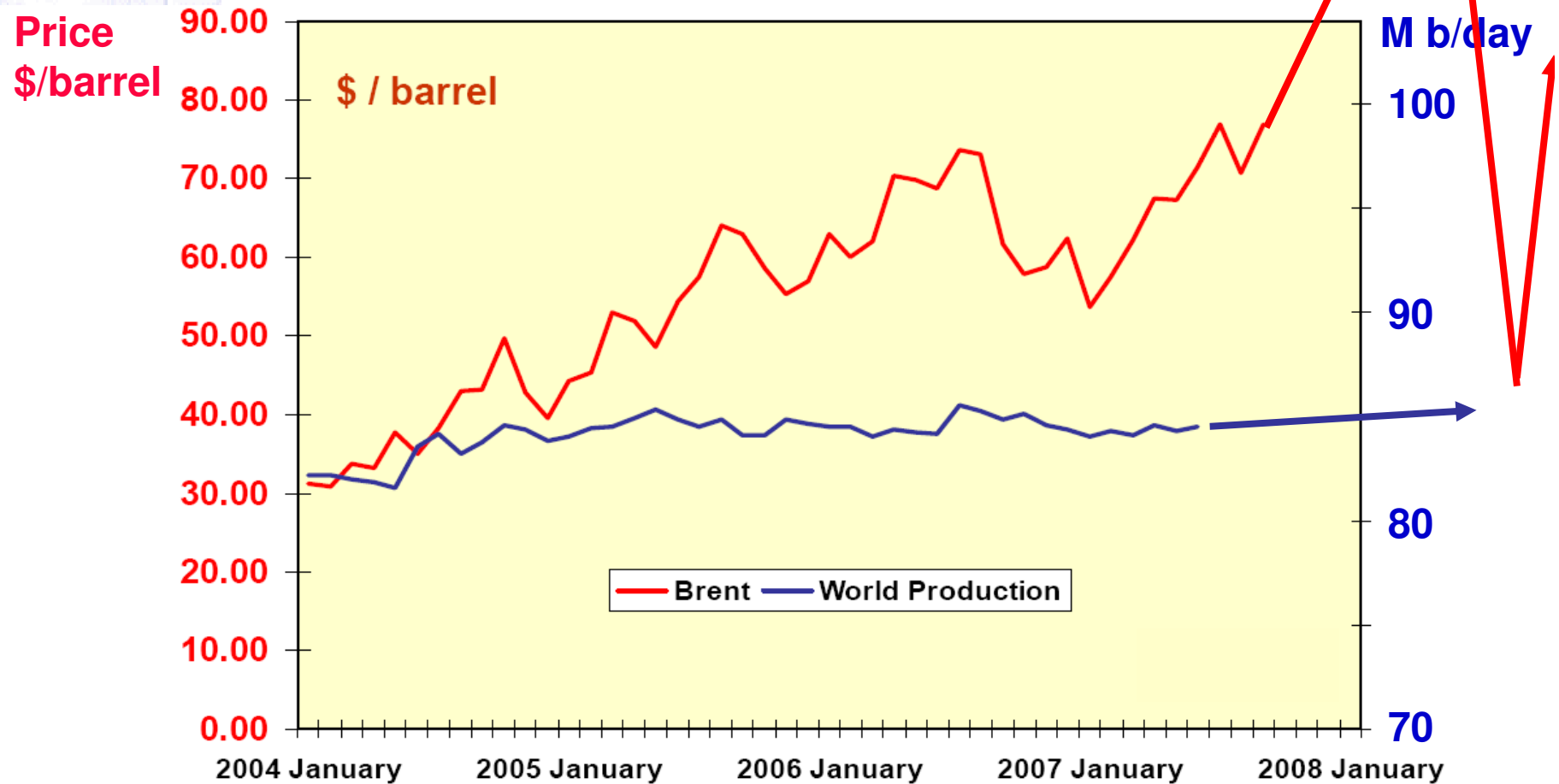


Dr. Sadad I. Al Hussein, ex Saudi Aramco

Oil and Money Conference, London, October 30, 2007

...predicts a 10 year plateau

a structural ceiling determined by geology

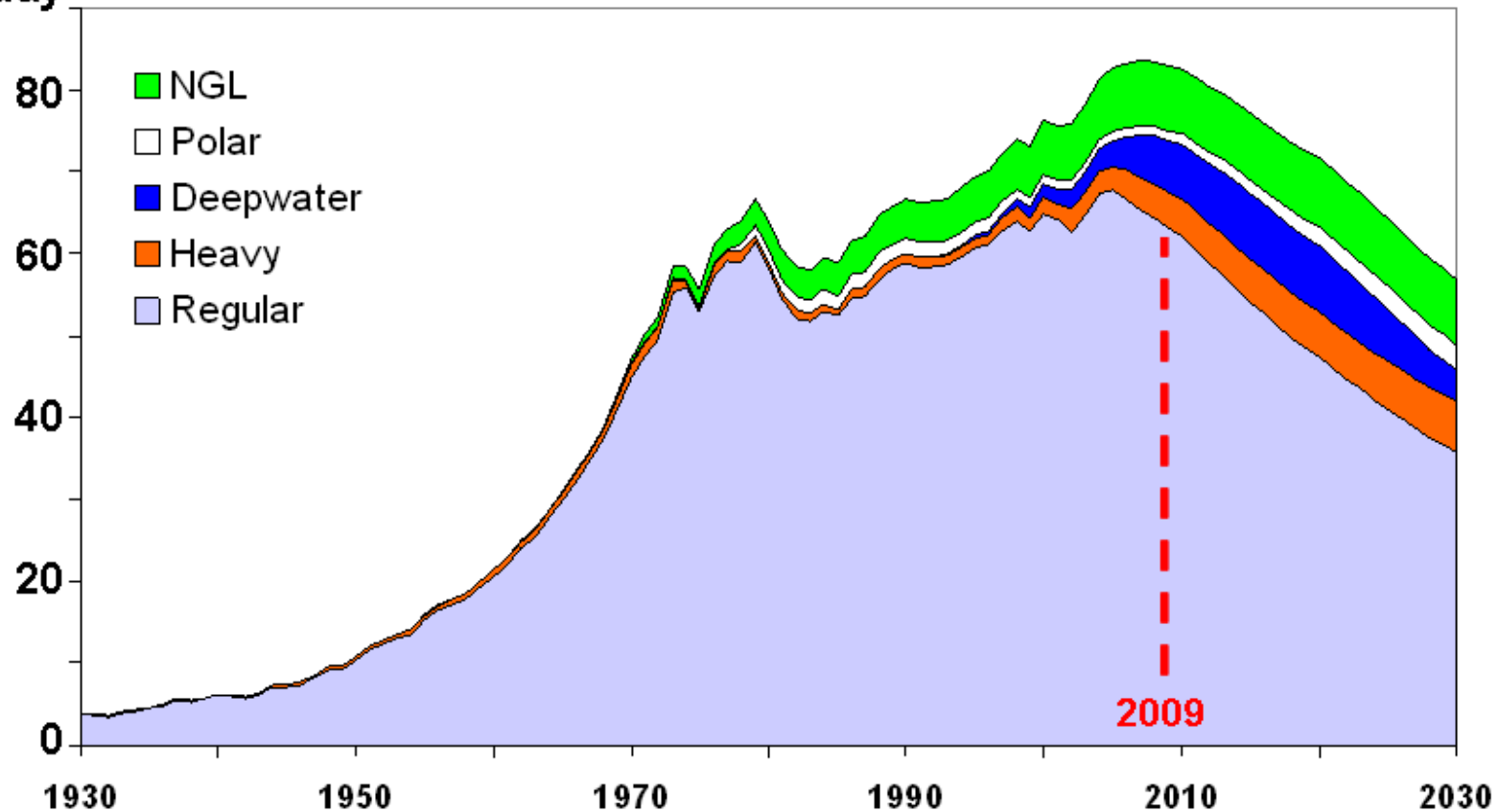


The economic mantra is that as prices rise, production will increase.
Clearly not true from these data.



WORLD OIL PRODUCTION FORECAST ASPO-2008 base case (CJC)

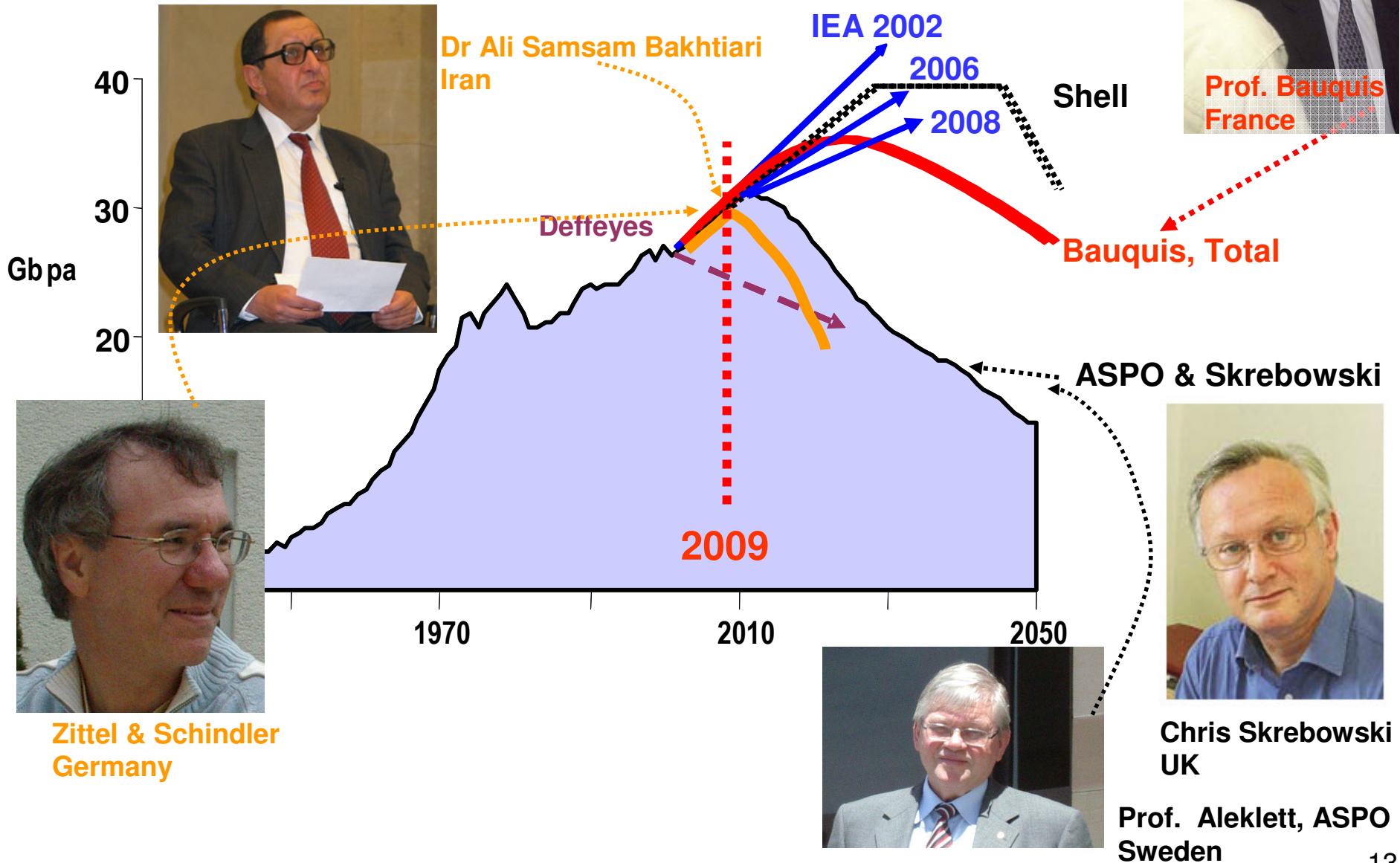
Million
barrels
per day



www.PeakOil.net ASPO 2008

World Oil Production and Forecasts

2012 +/- 5 years ?

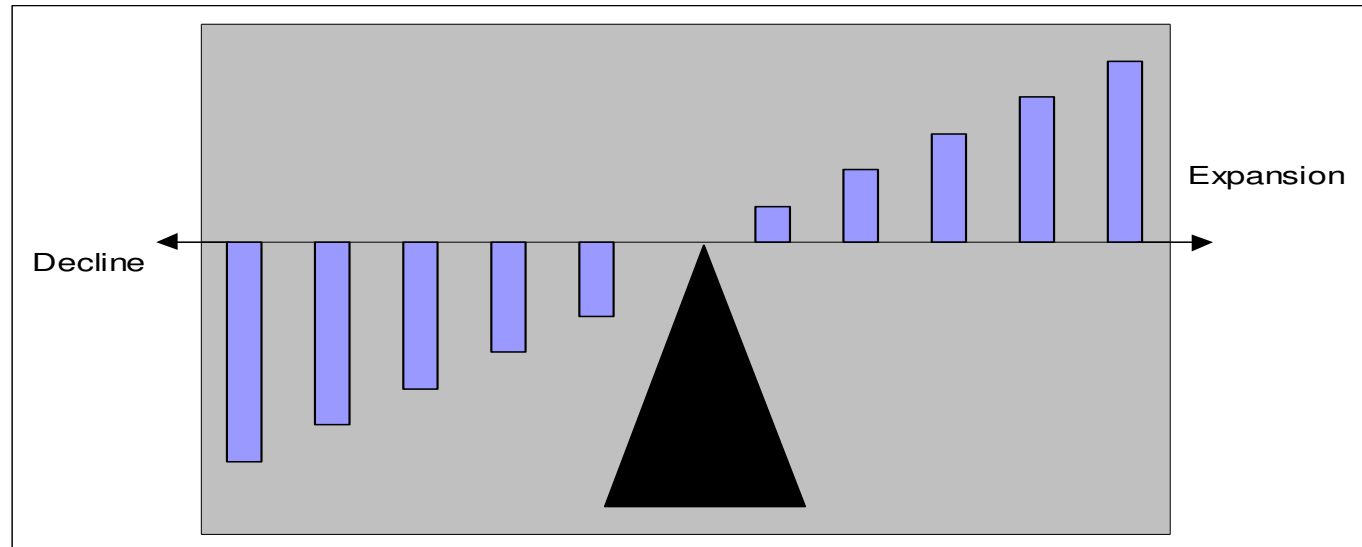


A simple observation -- or why peak will be earlier than most people expect

Chris Skrebowski
Petroleum Review
London

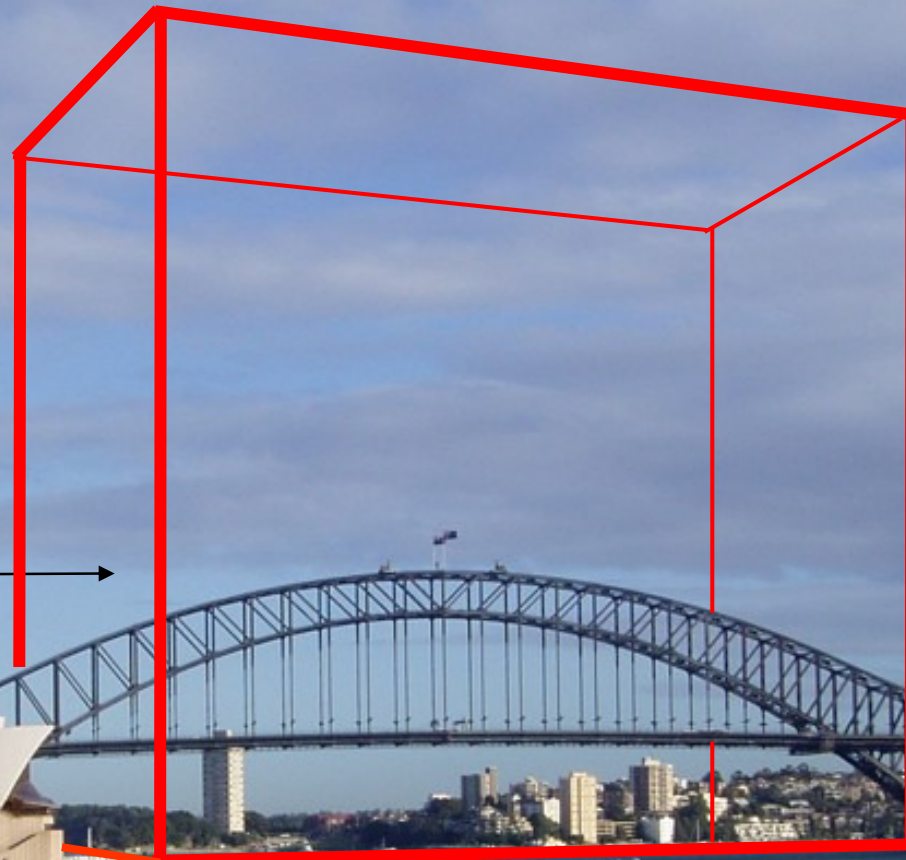


‘Global production falls when loss of output from countries in decline exceeds gains in output from those that are expanding.’



**Australia uses
51,000 megalitres
of oil each year
a 370m cube**

**Sydney Harbour Bridge
is 134 m high** →



80% of Australia's oil usage is in transport

If Australia's 20 M tpa wheat crop → ethanol = 10%



UPPSALA
UNIVERSITET

How much energy is bound in oil?

100 ml of oil contains 1 kWh

What can you do with 1 kWh?

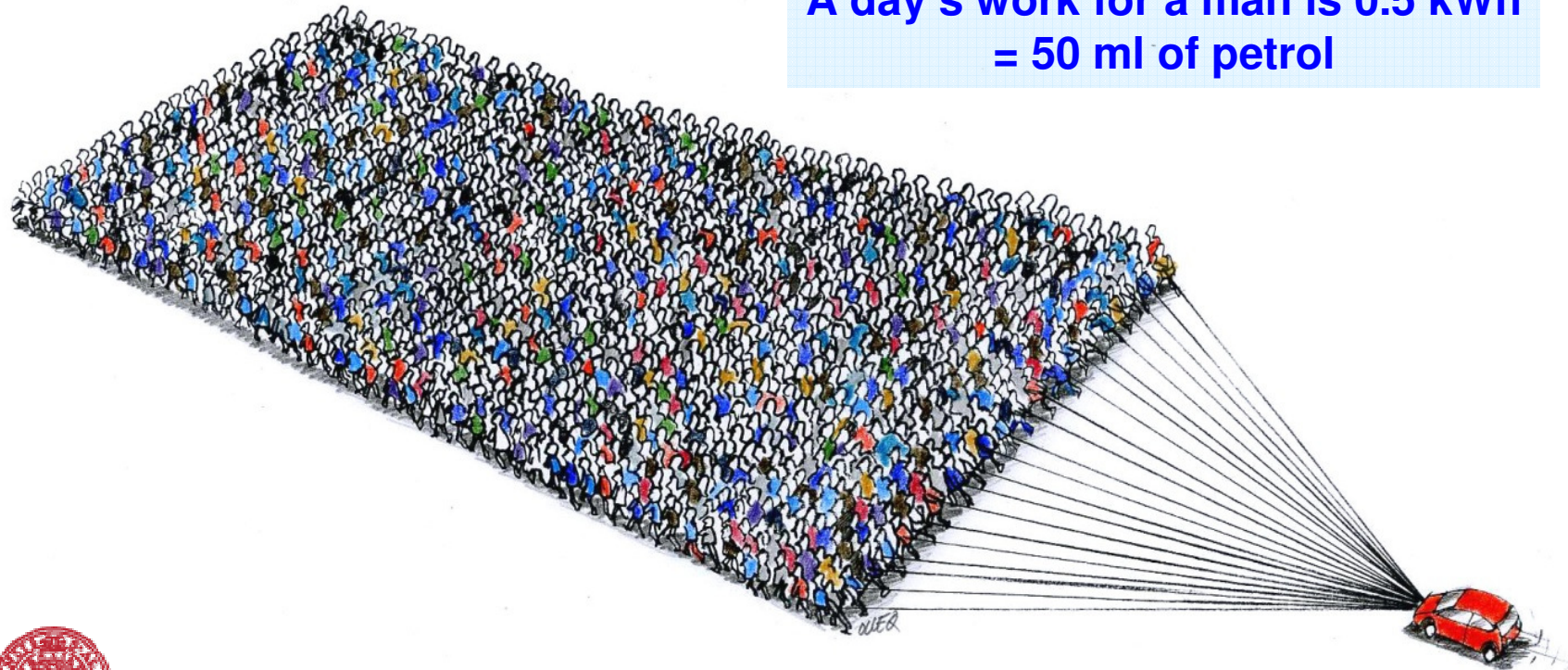
You can move a small car to the top of the Eiffel Tower!

Filling your car with 50 litres is equal to the energy you need to move 500 cars to the top of the Tower.



50 litres of gasoline is equal to the work of 1000 persons during one day

A day's work for a man is 0.5 kWh
= 50 ml of petrol



Million barrels/ day 2008

BP Statistical Review, 2009

Australia uses 0.9

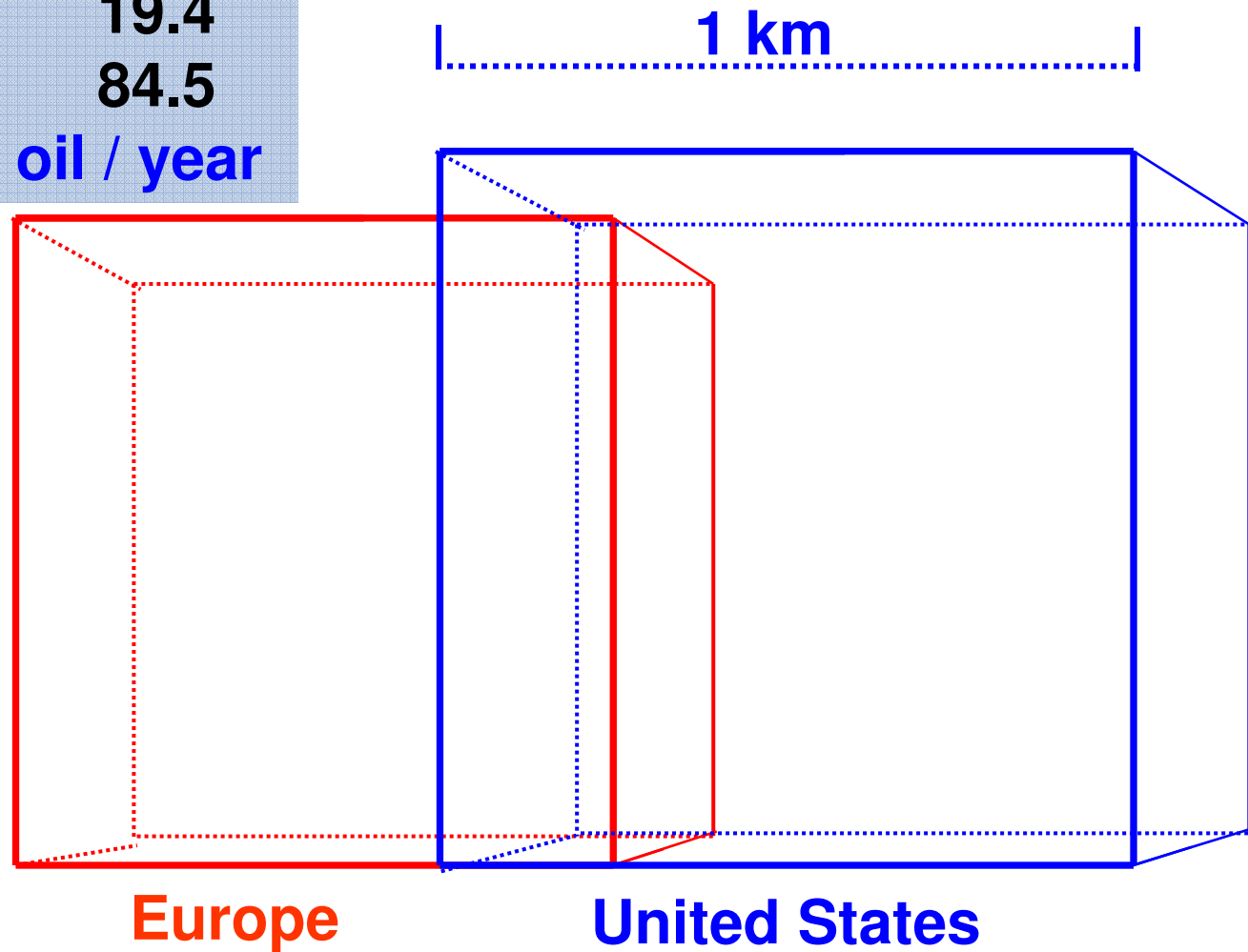
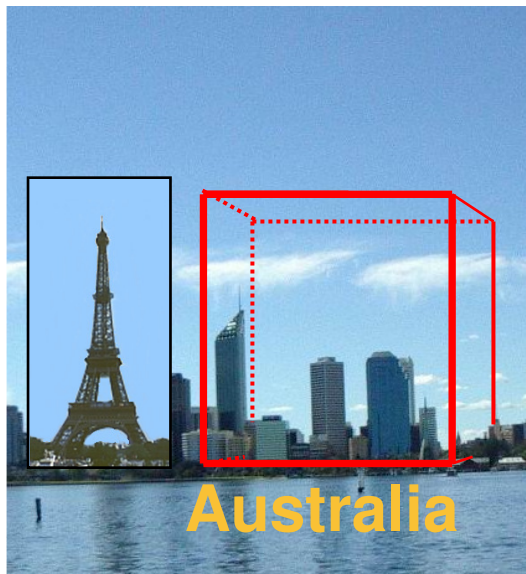
China 8.0

Europe 14.8

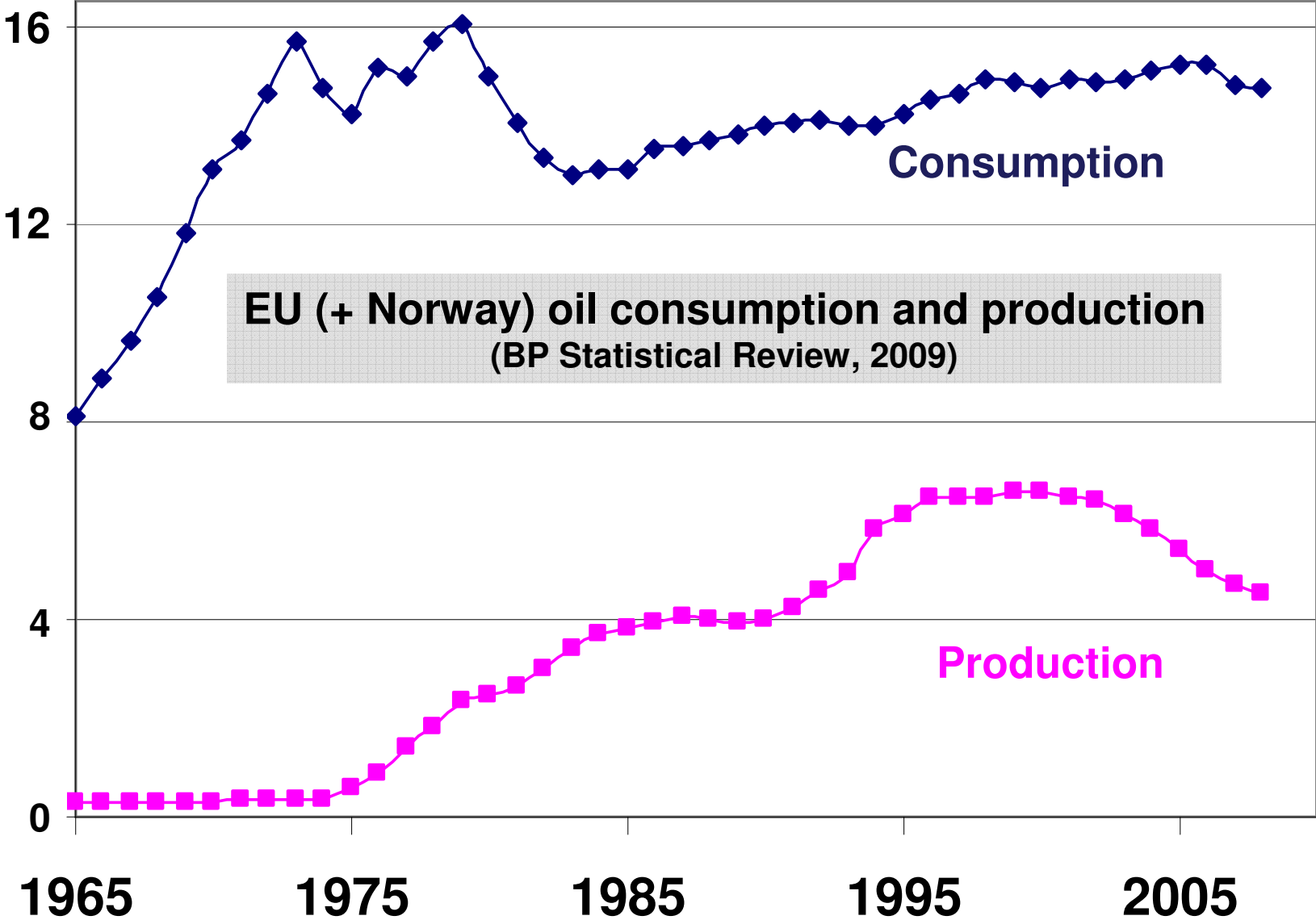
US 19.4

World 84.5

US 1 cubic km oil / year

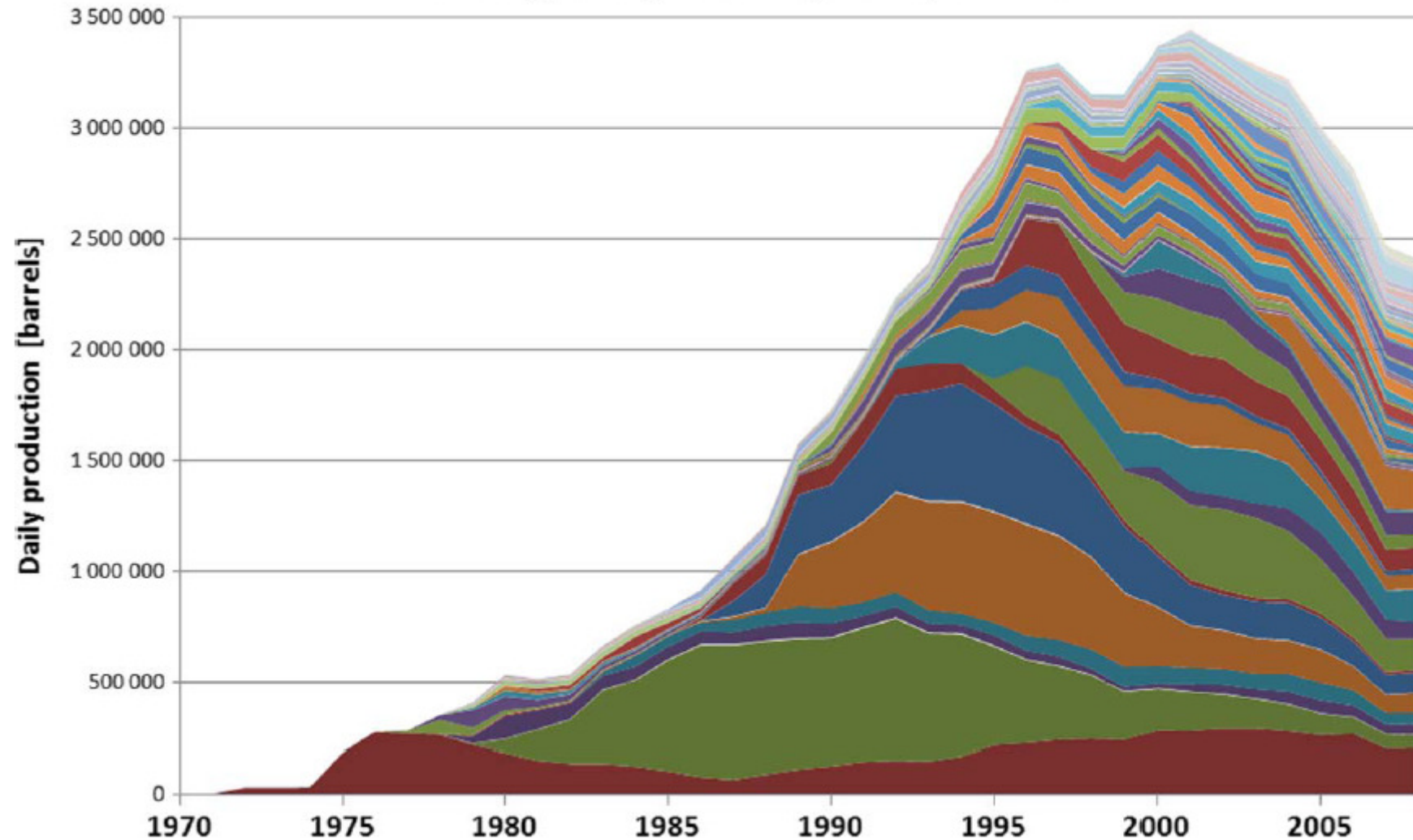


Million barrels/day



Caution: BP does not report all 27 EU countries separately
CY,EE,LV,MT and SL omitted. Norway included as European oil producer

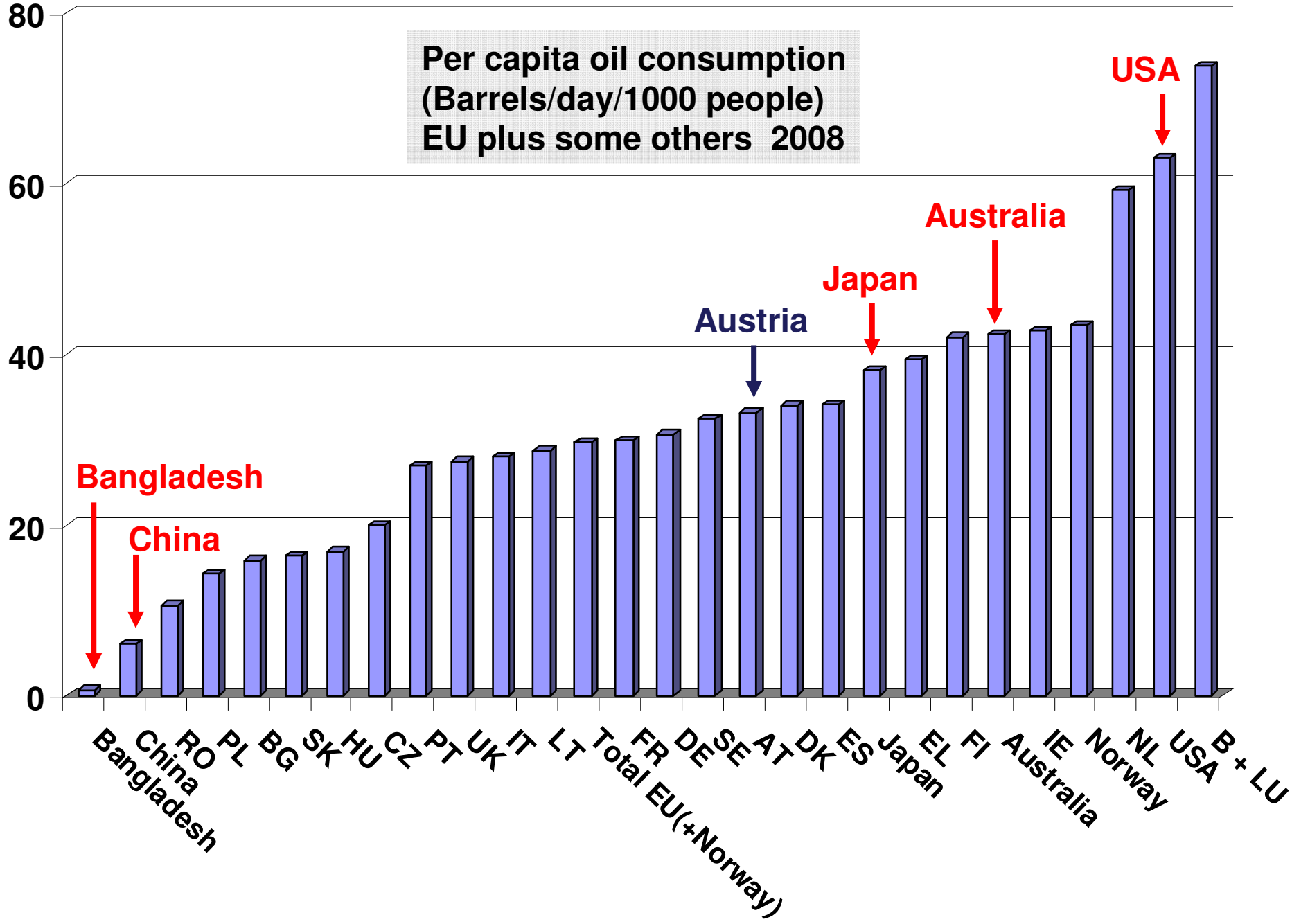
Norwegian oil production, field-by-field view

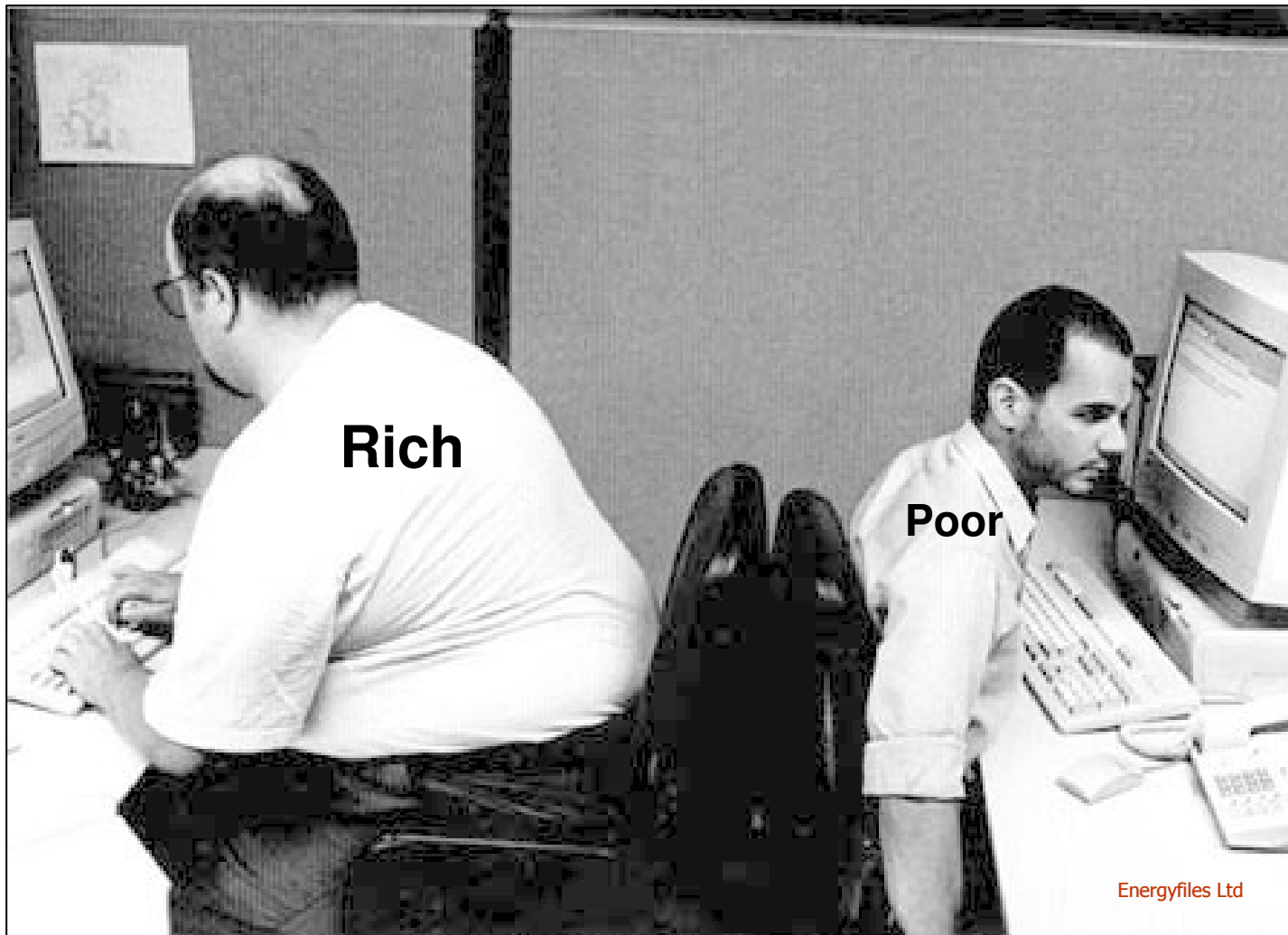


Big fields are found first, and as they decline, they are replaced by smaller and smaller fields soon the additional small fields can not match the decline of the large fields, so the overall production begins its final decline



Per capita oil consumption
(Barrels/day/1000 people)
EU plus some others 2008





Oil consumption is not shared equitably
US: 5% of world's population
uses ~ 25% of world oil

Unsettling Suburbia: The New Landscape of Oil and Mortgage Vulnerability in Australian Cities

Jago Dodson and Neil Sipe

Mapping oil vulnerability at high resolution provides useful information for planners.

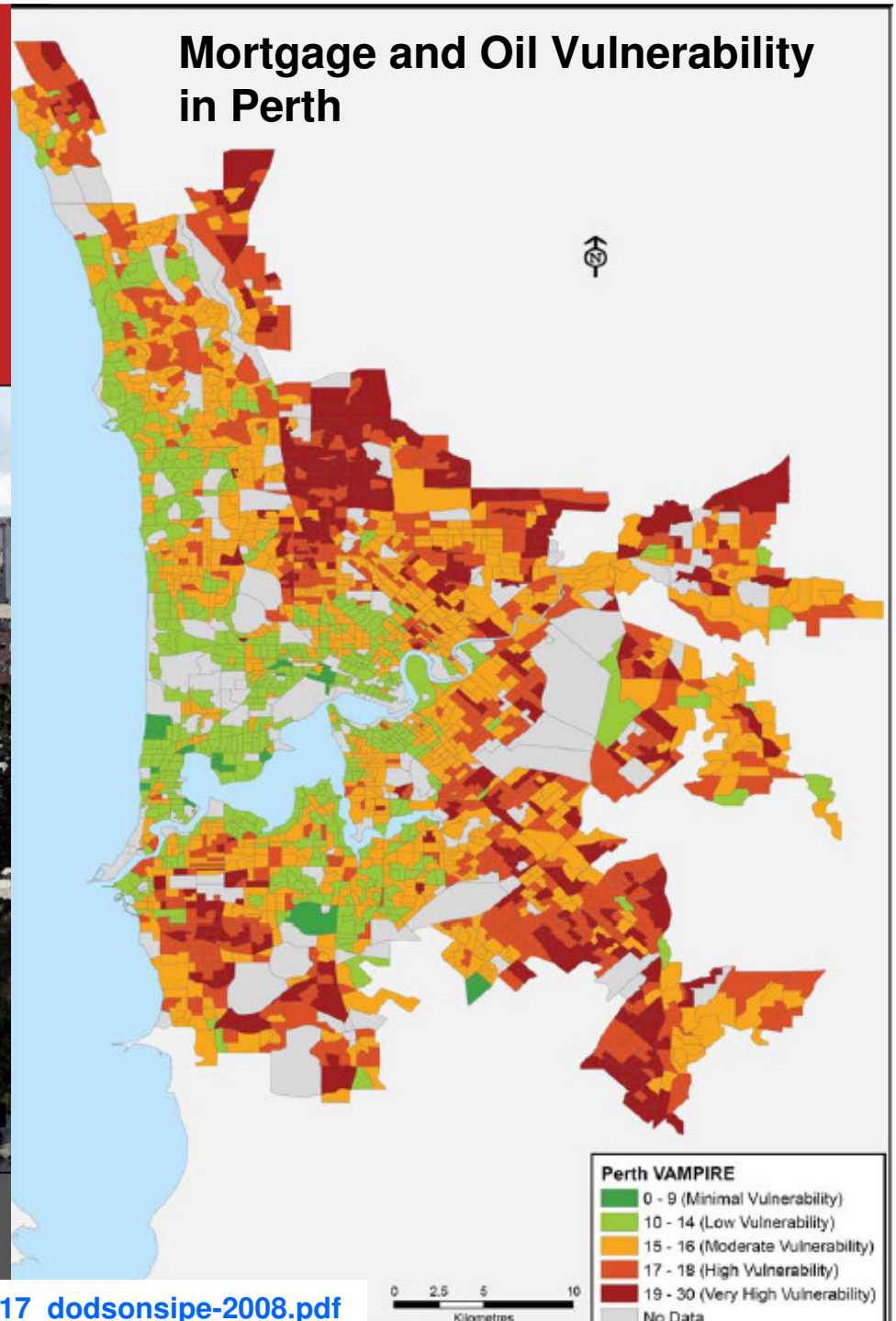
Like US cities, the outer suburbs of Australian cities are more at risk from rising fuel prices and mortgage interest rates.

Oil vulnerabilities of cities and regions would be very useful to see where the biggest oil vulnerability risks are (and to help devise relevant mitigation and adaptation strategies)



Urban Research Program

Research Paper 17
August 2008





ASPO Australia

Australian Association for the Study of Peak Oil and Gas
www.ASPO-Australia.org.au

General priorities for facing Peak Oil

1: Awareness and engagement

2: Frugality

3: Efficiency

4: Equity

Low priority

**Alternative fuels
and technologies**

Failure to act now will prove incredibly costly

Noah built the Ark before the flood. It is very hard to build an ark under water.

Oil vulnerability assessment and risk management are crucial, important tools for planners.



Bruce.Robinson@ASPO-Australia.org.au
61 427 398 708 61-8-9384-7409

*a few more slides follow,
in case they are needed for questions*

Government Policy and Action Options

- 1: "Talk about it, Talk about it"
2. Engage people, "Participatory democracy"
3. Dismantle the "perverse policies" that subsidise heavy car use and excessive freight transport.
4. Encourage frugal use of fuel, and disadvantage profligate users. Fuel taxes should be incrementally raised to reduce usage.
- 5: SmartCard personal fuel allocation system. A flexible mechanism for short-term oil shocks, as well for encouraging people to reduce their fuel usage..
6. Concentrate on the psychological and social dimensions of automobile dependence, not just "technological fixes"
7. Implement nationwide "individualised marketing" travel demand management.
8. Railways, cyclepaths and public transport are better investments than more roads.
9. Give priority for remaining oil and gas supplies to food production, essential services and indigenous communities, using the Smart-Card system.
10. Review the oil vulnerability of every industry and community sector and how each may reduce their risks.
- 11 Promote through the United Nations an Intergovernmental Panel on Oil Depletion, and a Kyoto-like protocol to allocate equitably the declining oil among nations. An international tradable sliding scale allocation mechanism is one hypothetical option.**

Australian petrol & diesel rationing using 2010 technology

*Smart-card based, scalable, **tradeable**, flexible, quick to change, equitable, transparent.*

Fuel allocations should be per person, not per vehicle, and depend on

Location (inner or outer suburb, public transport access, regional or remote)

Health status (elderly or infirm, expectant mothers with toddlers), less for the fit who can ride a bicycle 20kms if needed

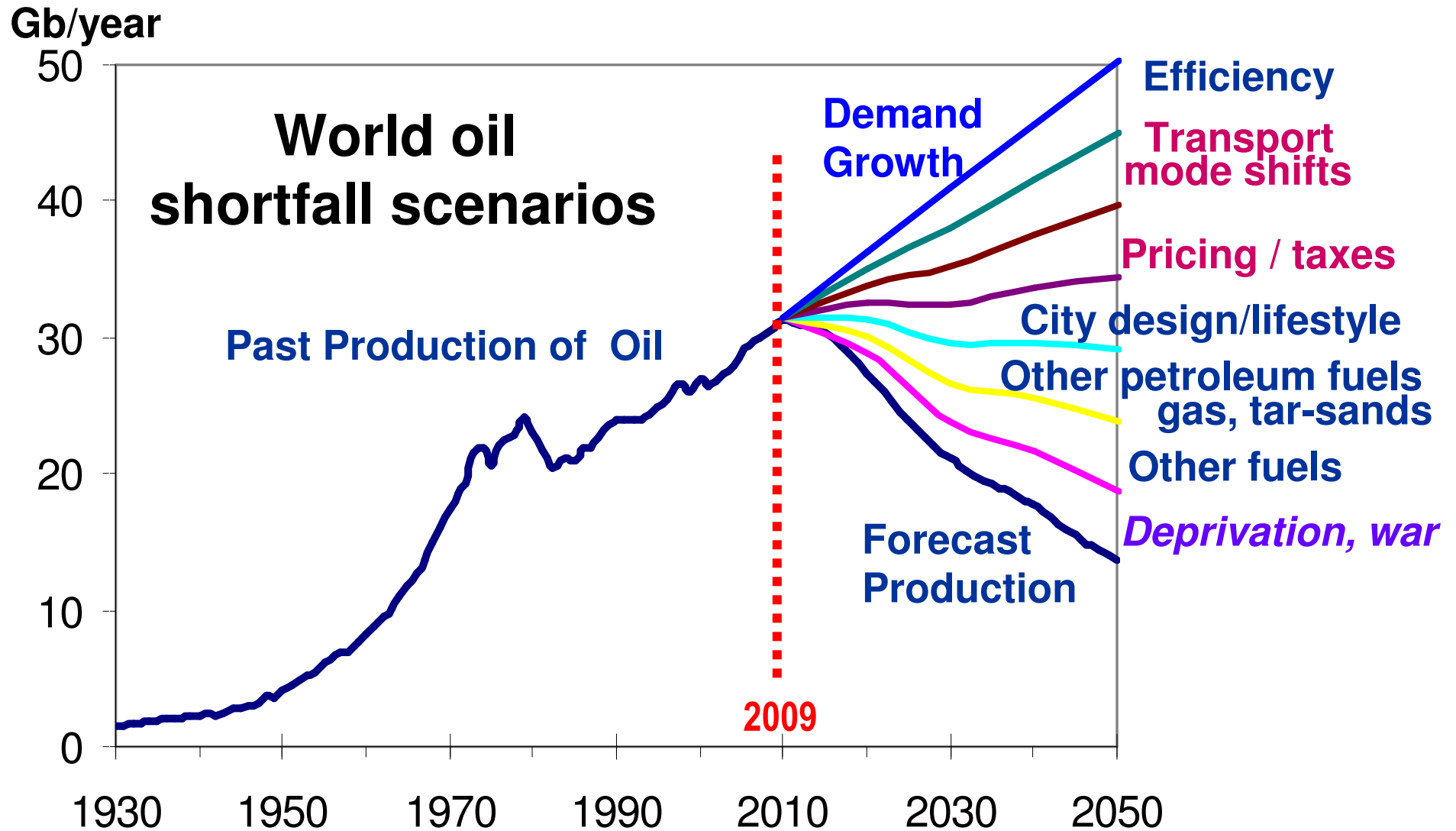
Job importance (defence, essential services, hospitals, food)

People are encouraged to conserve by being able to trade unused allowances electronically and automatically.

Martin Feldstein,
Chief Economic Advisor to
President Reagan,
now at Harvard, (WSJ 2006)

*"tradeable gasoline rights
are more efficient than
fuel economy standards
or gasoline taxes"*





- **no single “Magic Bullet” solution,**
- **probably no replacement ever for cheap plentiful oil**
- **Urgent preparation and adjustment are vital**

Million barrels/day Consumption EU (+ Norway) and Australia

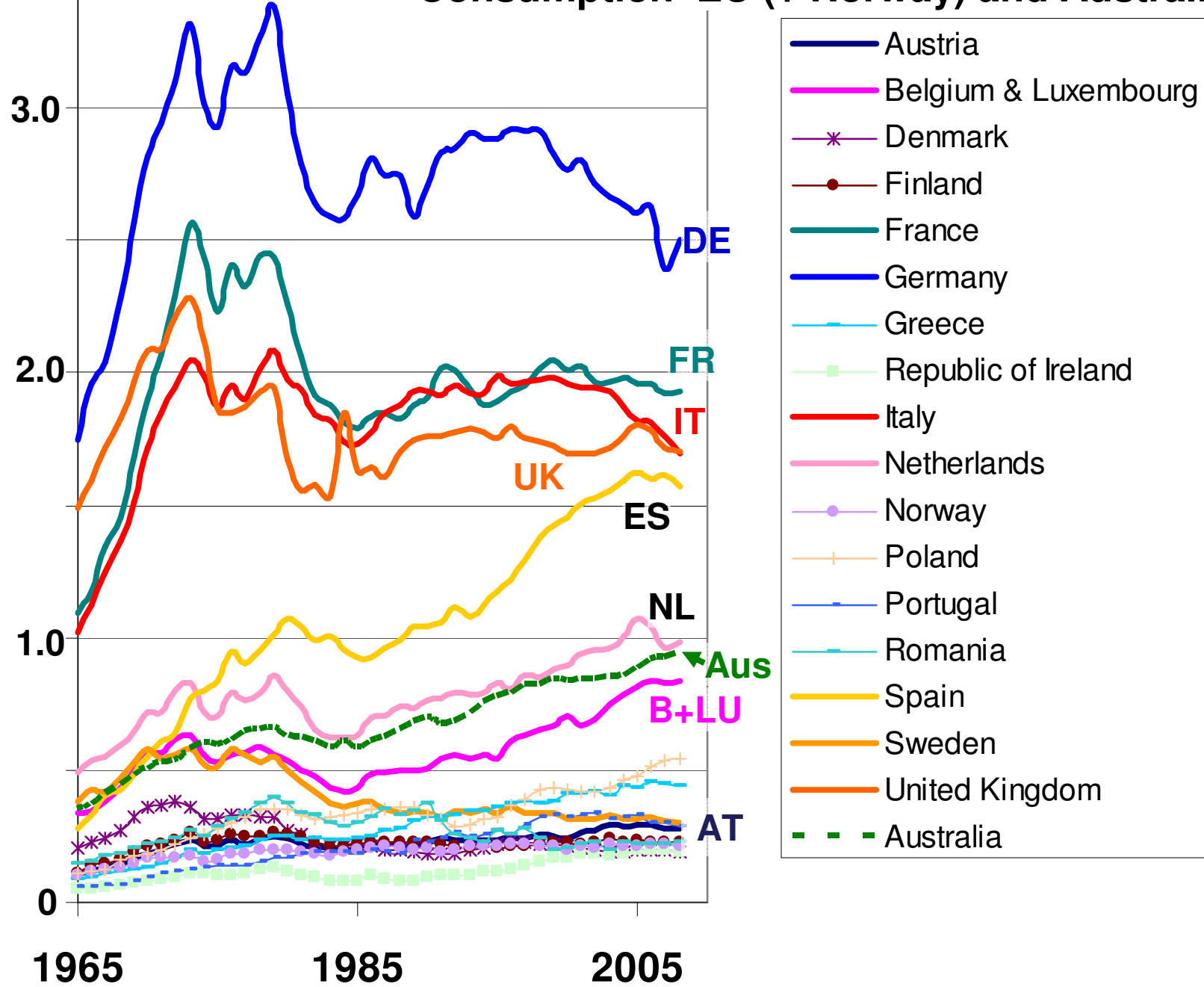
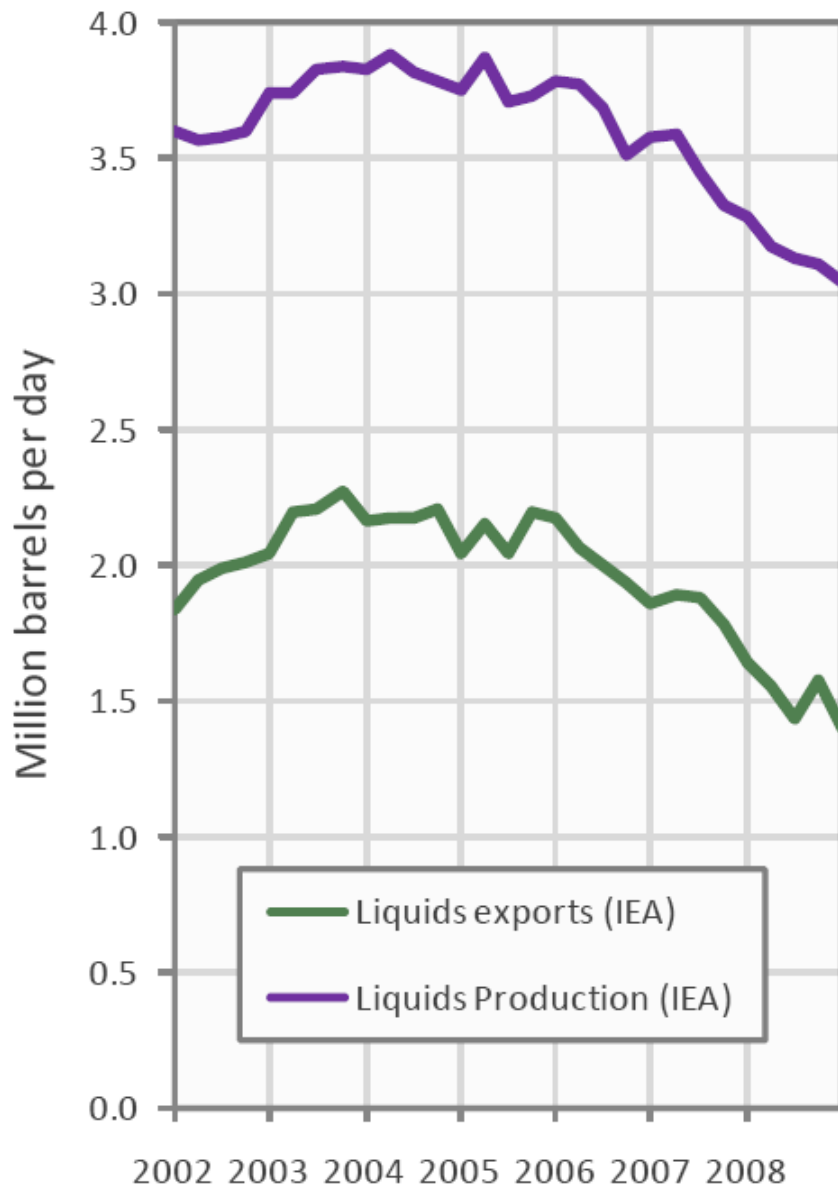
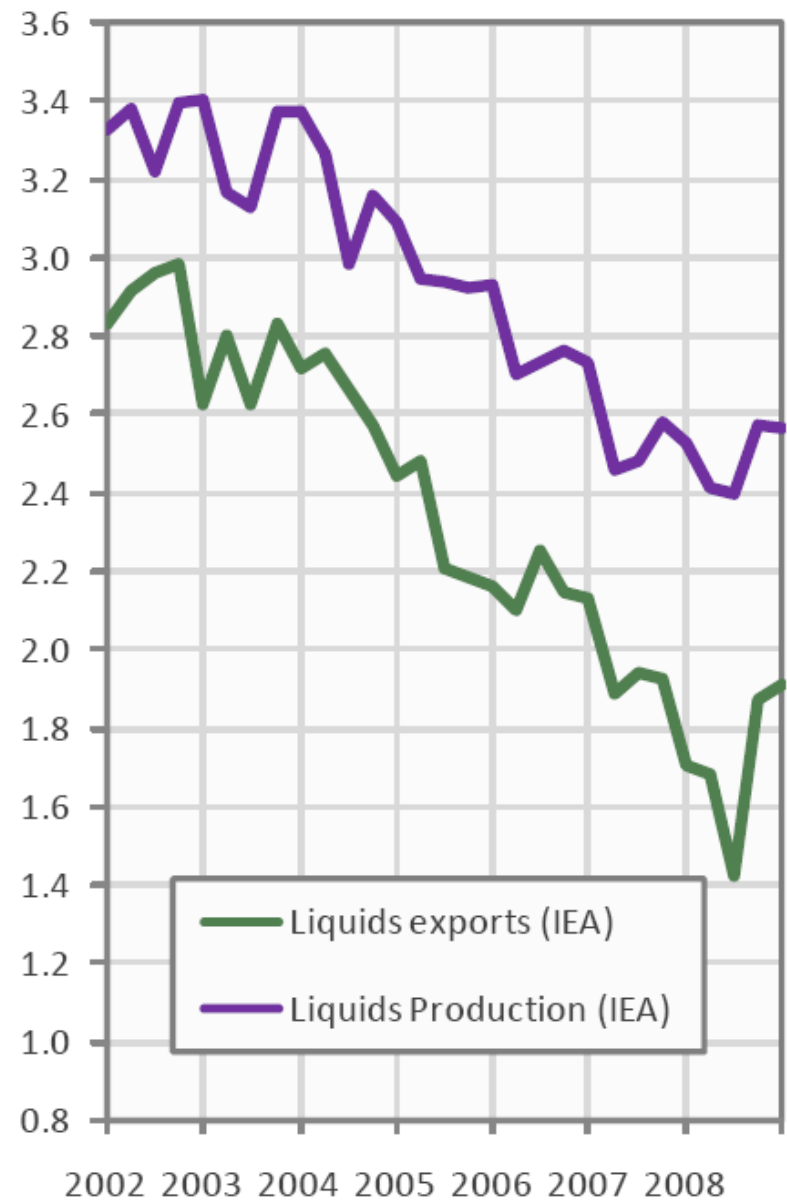


Chart 47: Mexico oil exports 1st qrt. 2002 - 1st qrt. 2009

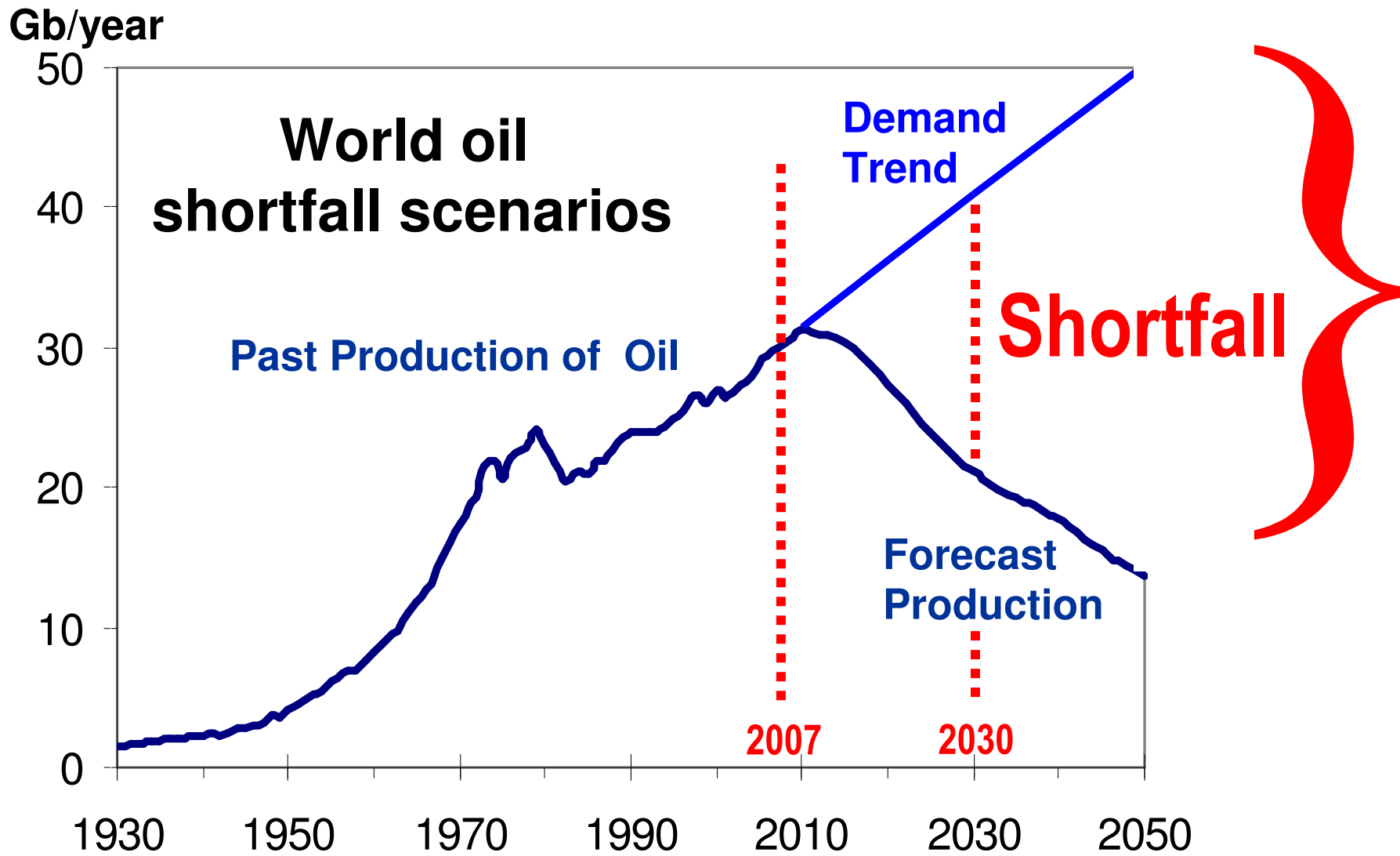


Source: International Energy Agency

Chart 49: Norway oil exports 1st qrt. 2002 - 1st qrt. 2009



Source: International Energy Agency



By 2030, the gap is equivalent to 6,000 nuclear reactors



“OK, it’s agreed – we announce that to do nothing is not an option and then we wait and see how things pan out”

from ‘Private Eye’



Government of Western Australia

STATE LIQUID FUEL SHORTAGE EMERGENCY PLAN

OPERATIONAL PLAN

PREPARED BY

ENERGY SAFETY DIRECTORATE

DEPARTMENT OF CONSUMER

AND EMPLOYMENT PROTECTION

20 Southport Street, W Leederville WA 6007

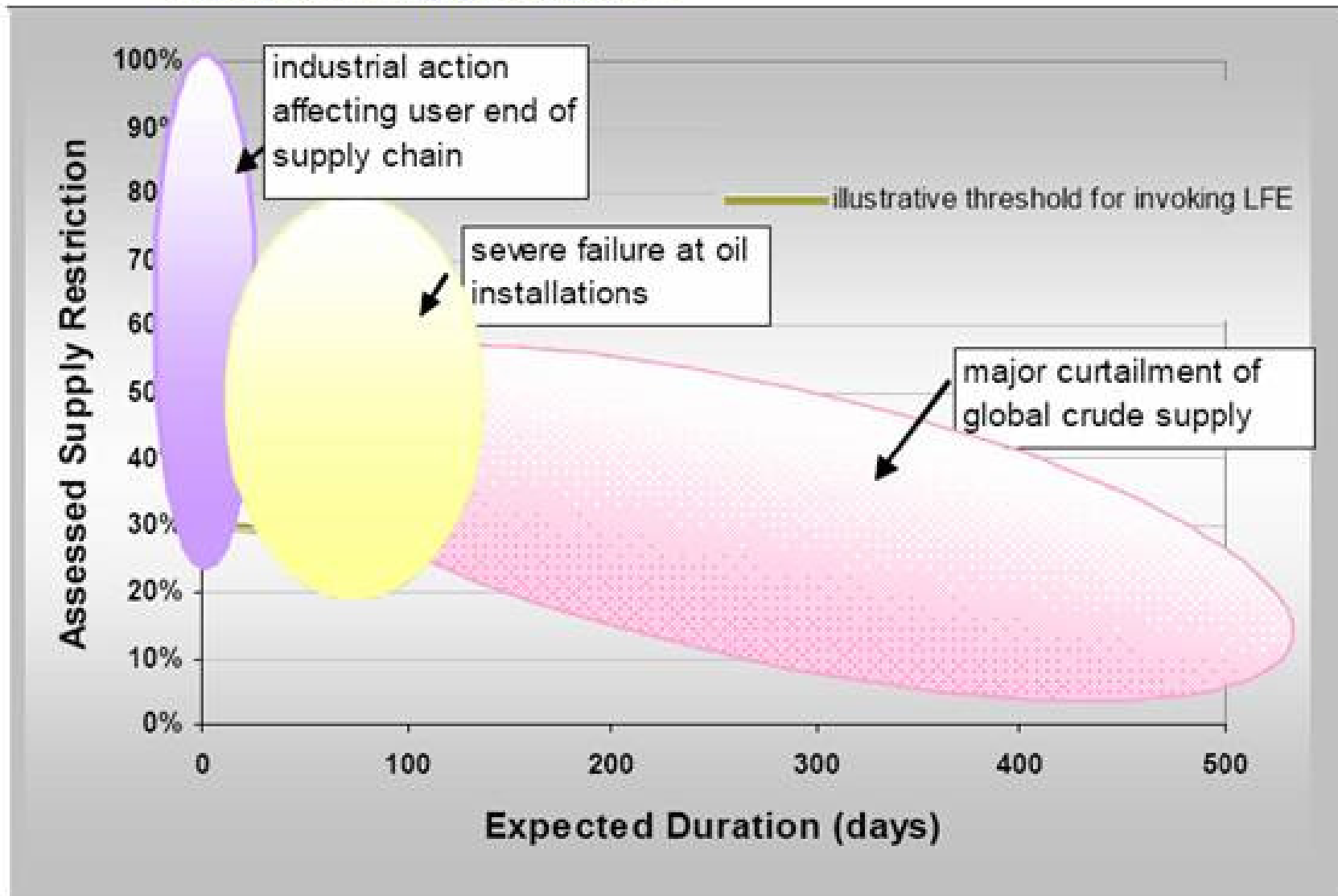
Tel: (08) 9422 5200 Fax: (08) 9422 5244

January 2003

**Current WA Government planning for a sudden fuel shortage
Ineffective and inequitable. Odds & Even number plates etc**

Nothing significant about public transport

Figure 10 Disruption scenarios — circumstances in which government intervention may be called for



Note: see text for explanation.

Data source: ACIL Tasman

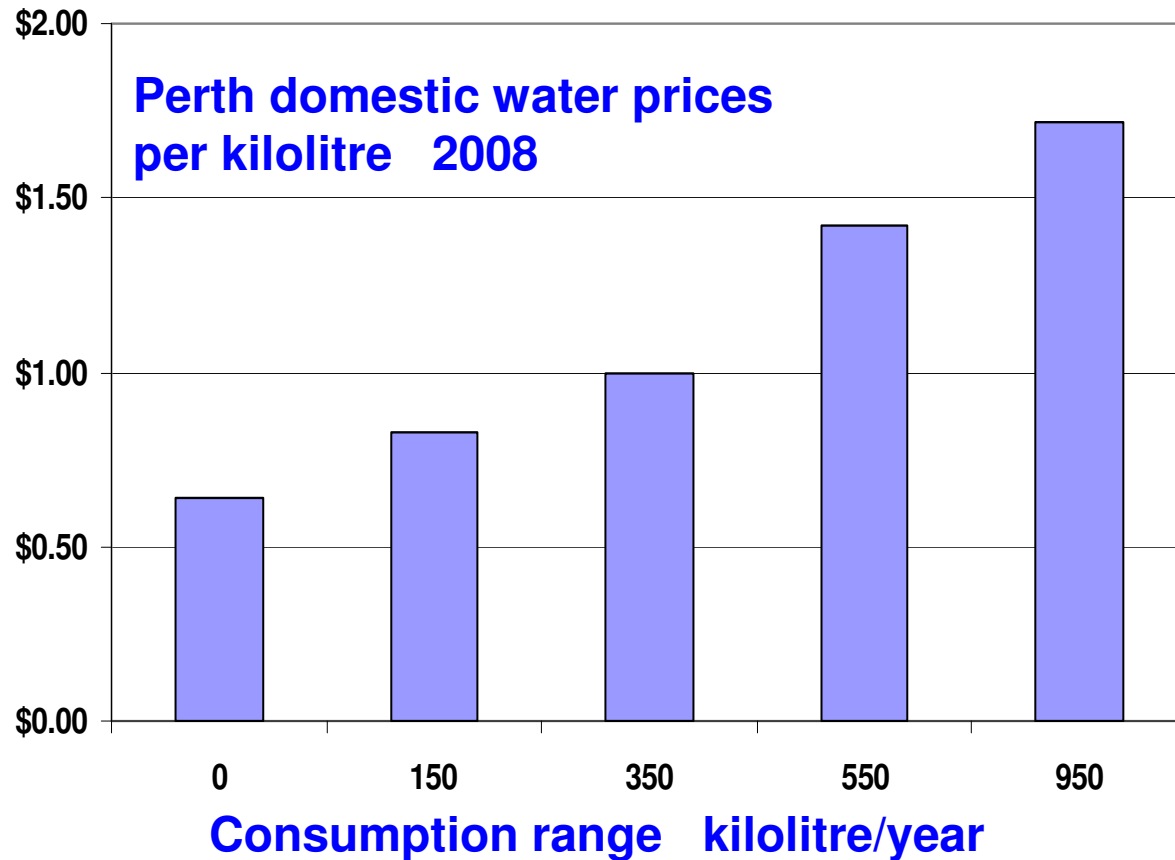
discussion paper, Liquid Fuel Emergency Act review, 2004

Water Analogy for Fuel Pricing

A rational pricing system
Perth domestic water
Renewable scarce resource

A personal fuel SmartCard system could tax petrol and diesel on a sliding scale like water.

People could trade unused allocations to those who want more fuel.

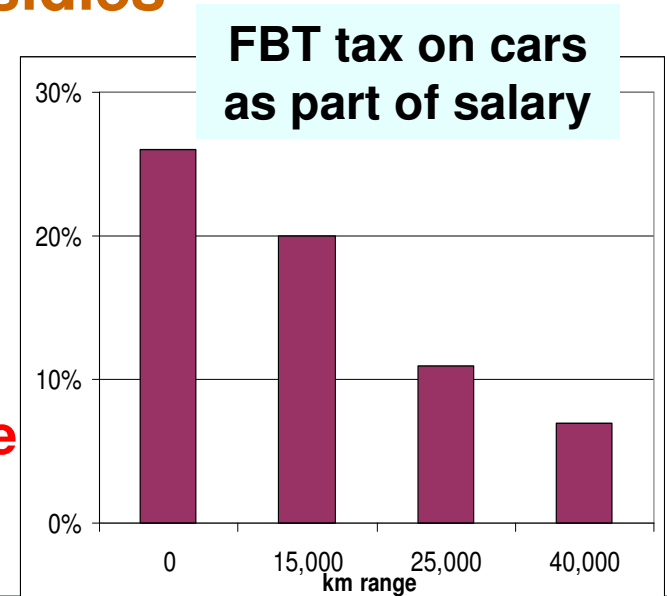


There are innumerable “Perverse” subsidies



to
roads,
4WDs
profligate vehicle users
heavy inefficient vehicles

**Supermarkets subsidise
CO2 \$18/tonne
with their fuel docketts**

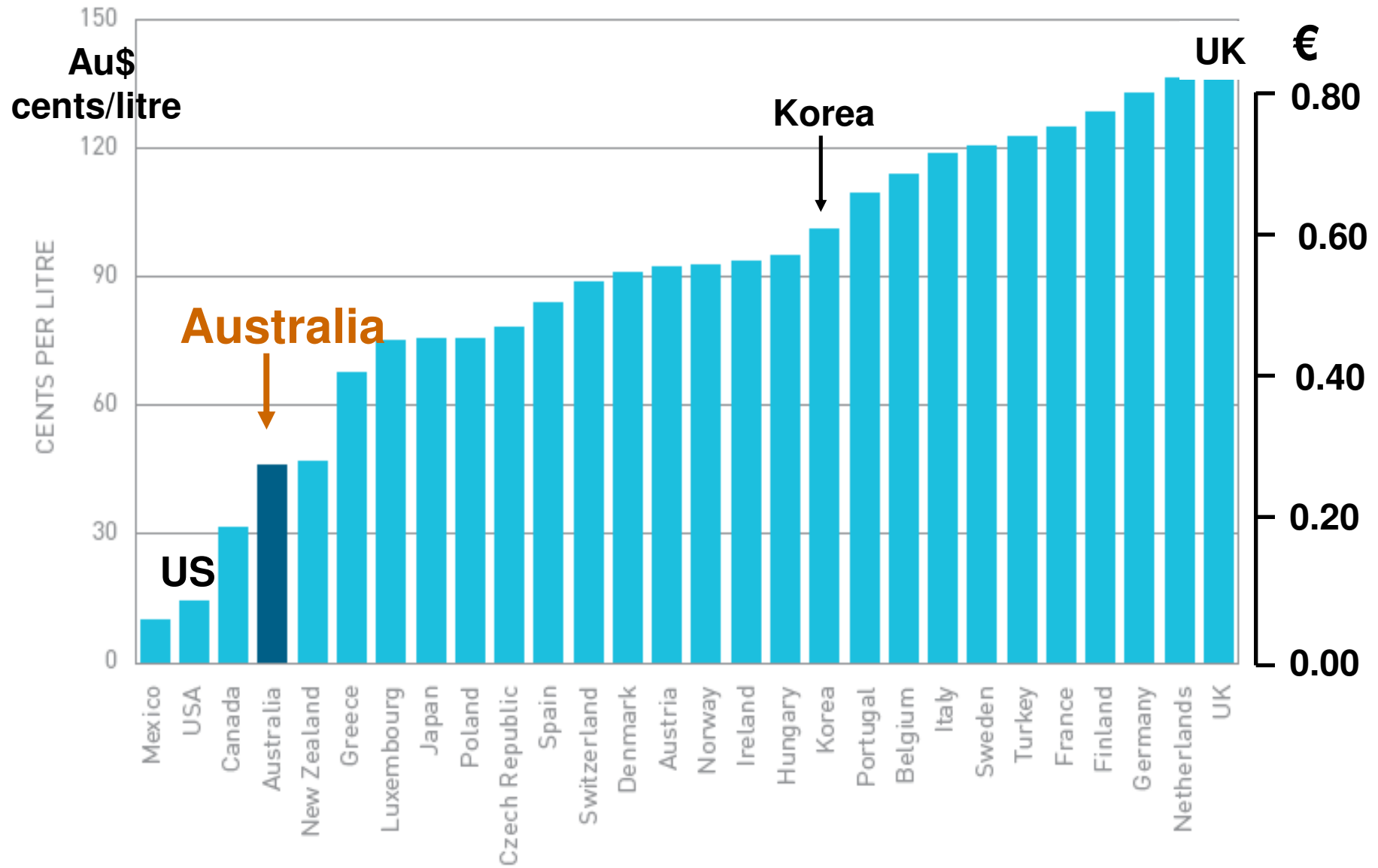


Supermarket petrol discounts

**People who walk to the
supermarket are subsidising
those who drive in the big SUVs**

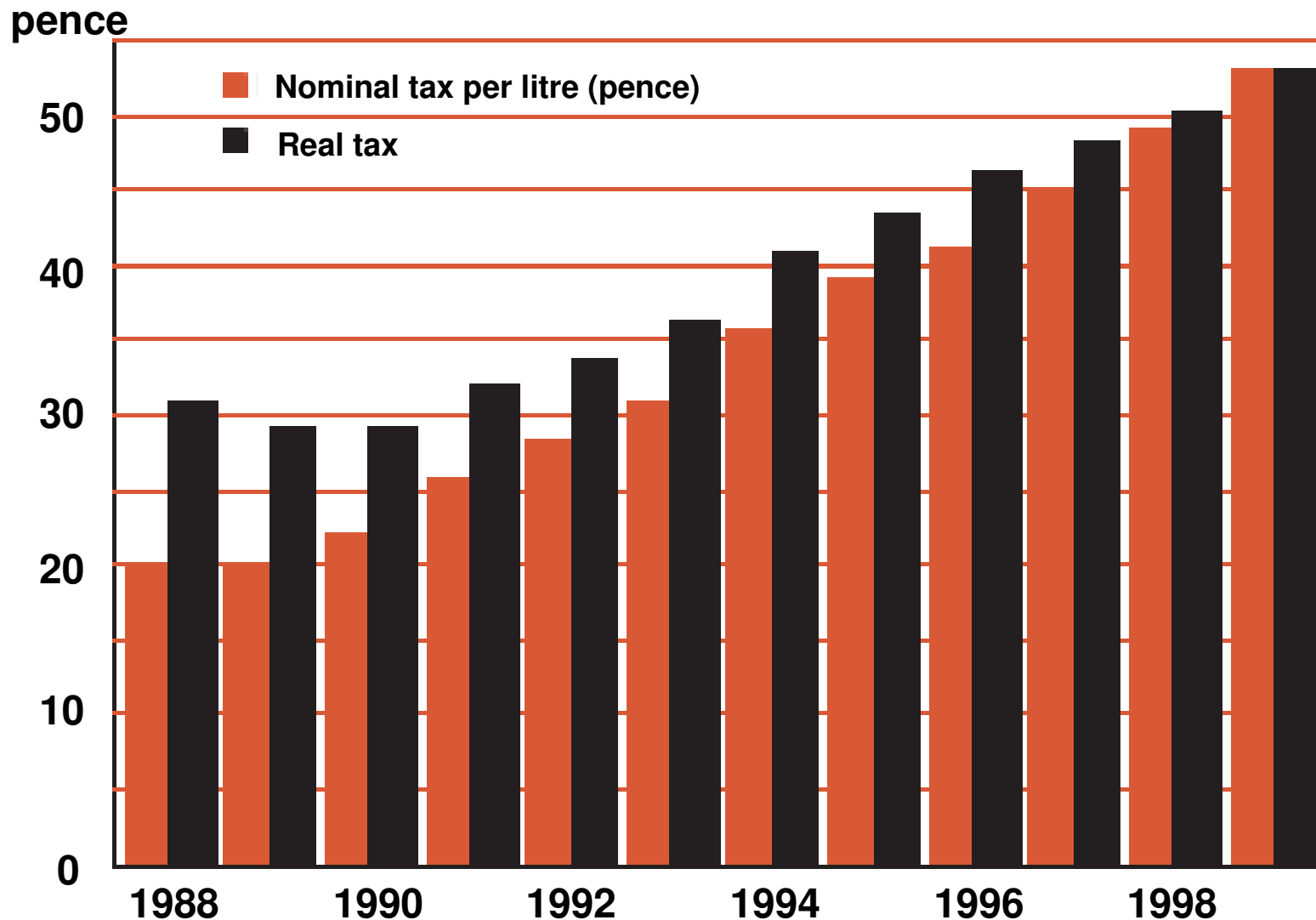


Petrol taxes OECD

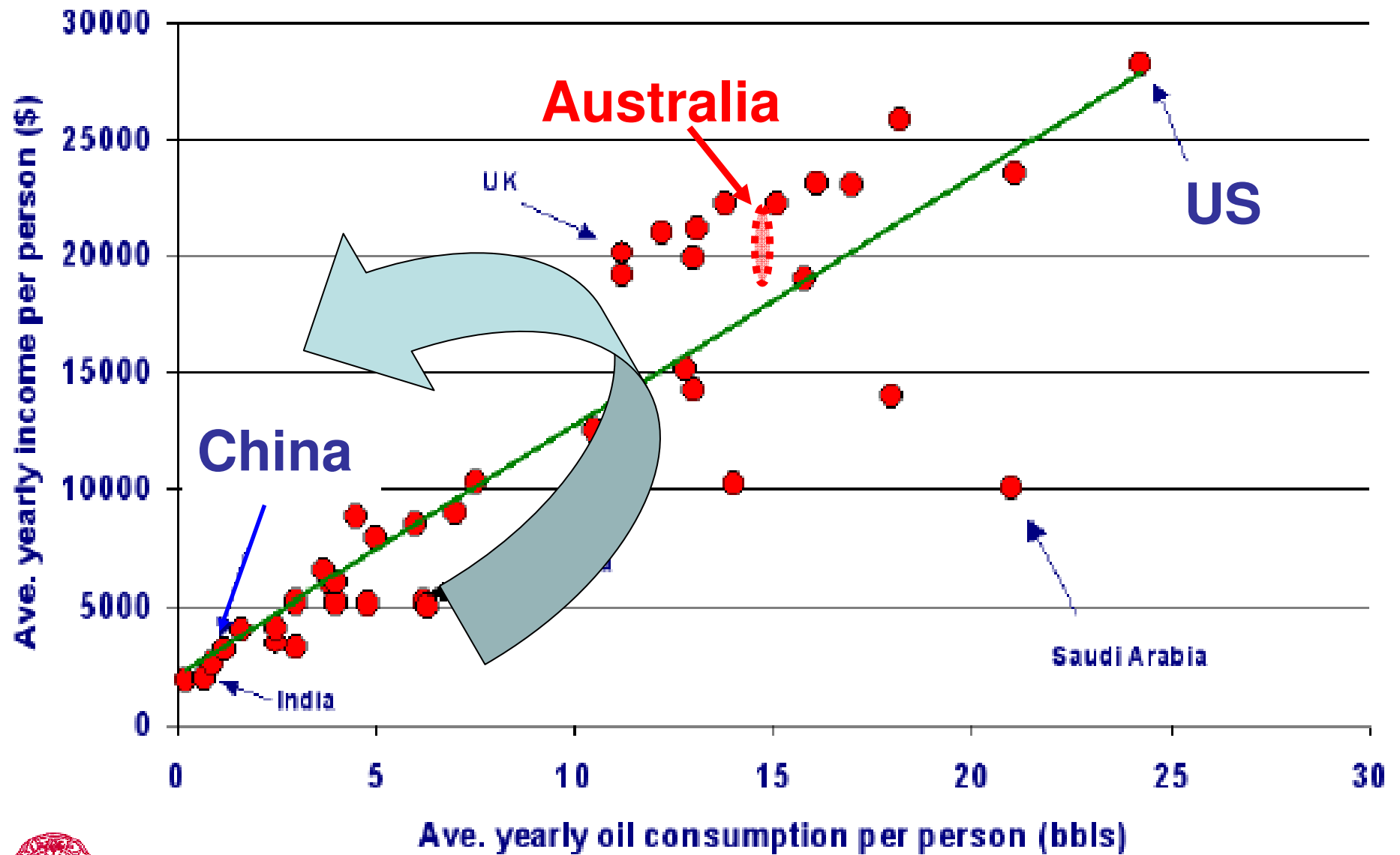


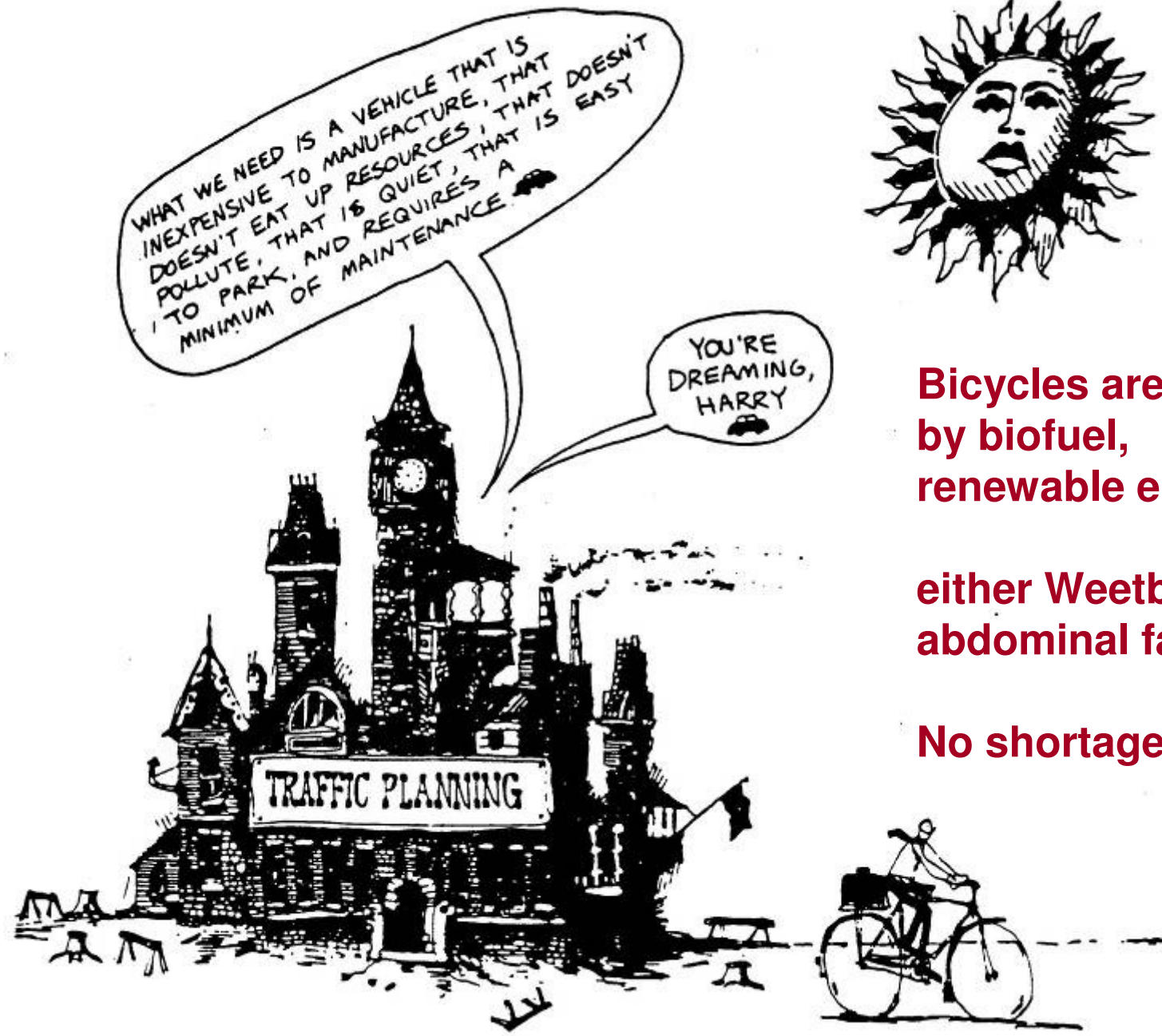
IEA Dec 2003

The UK Fuel Tax Escalator Margaret Thatcher



Australian fuel taxes should be raised to European levels on a fuel tax escalator

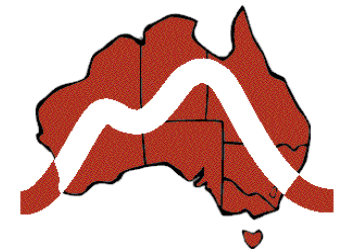




**Bicycles are powered
by biofuel,
renewable energy,**

**either Weetbix or
abdominal fat**

No shortage of either



Sustainable Transport Challenges

Sunshine Coast
Regional Council

Addressing *Peak Oil Vulnerability*

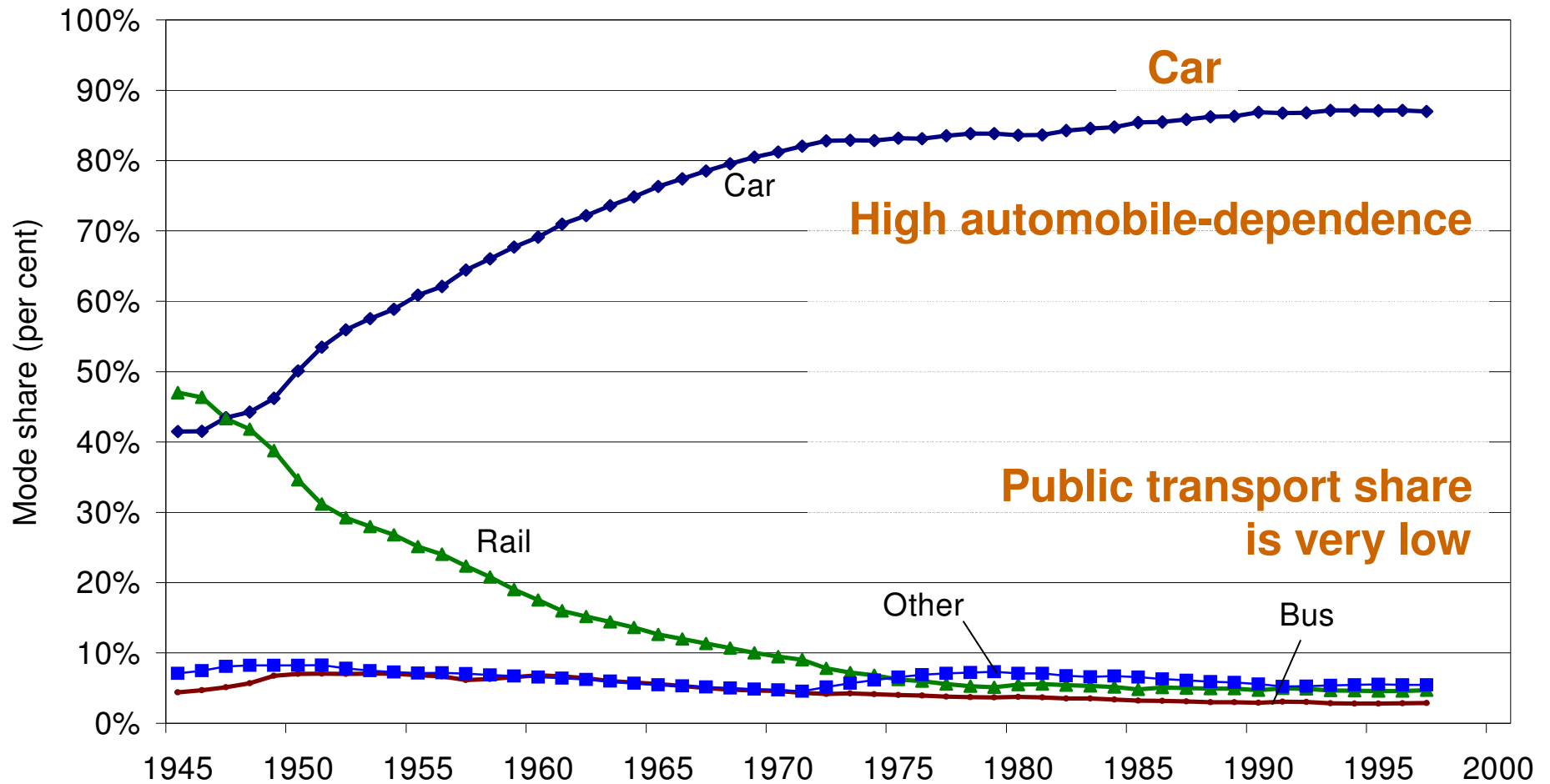
- ▶ Sunshine Coast residents are **heavily reliant on their cars** (Approx **90%** of trips to work)
- ▶ As oil supplies decline (reaching Peak Oil), we are likely to be more **vulnerable to rising fuel prices**.
- ▶ The challenge is to provide efficient and reliable **transport alternatives** and plan for and delivering **land** that support use of public transport, walking and cycling.
- ▶ An **energy transition** from oil dependency to sustainable energy sources is also required in future.



September 2009
Maribyrnong City Council's
Peak Oil Contingency Plan
a first for Australia



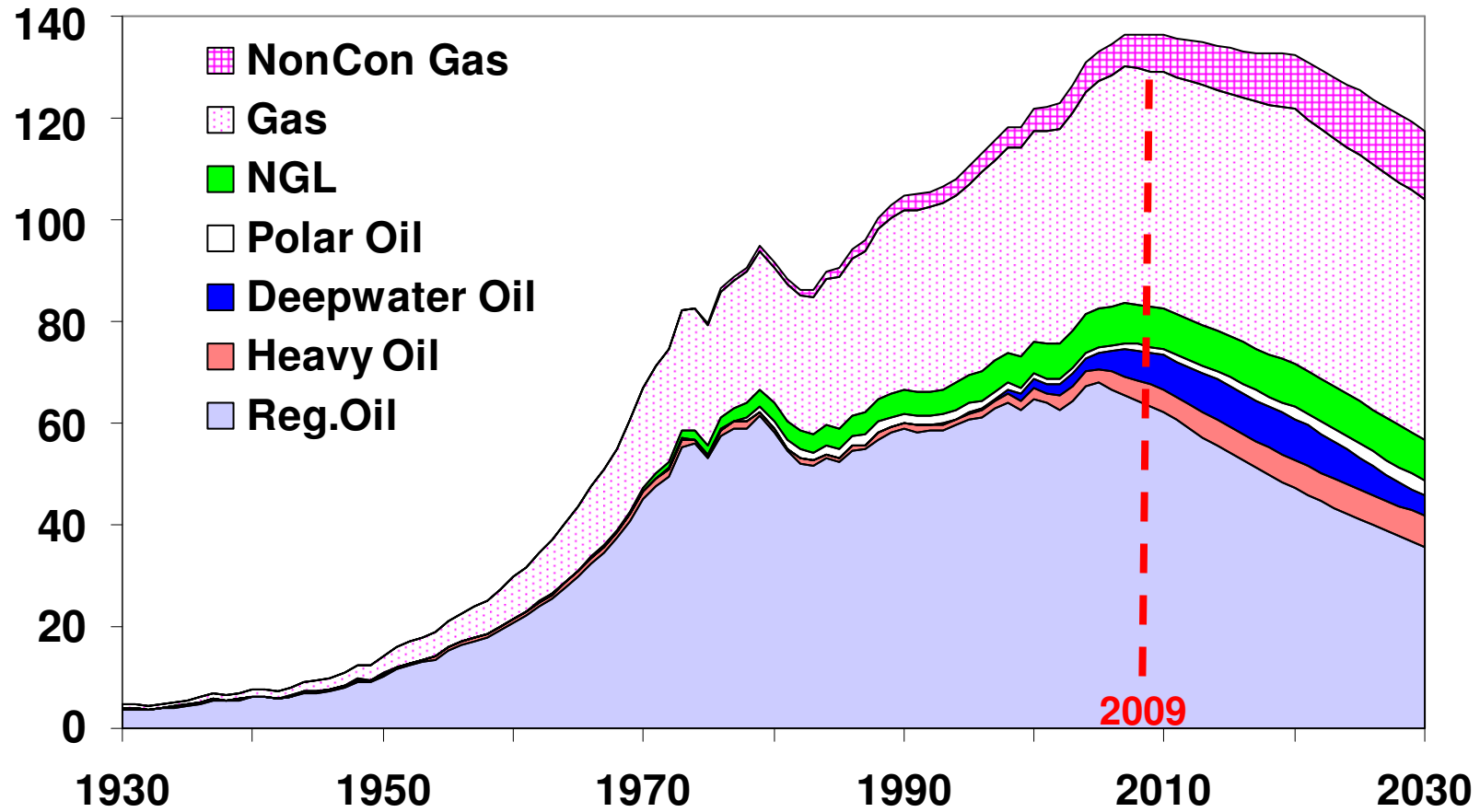
Urban passenger mode shares Australia



Million barrels
per day
(equivalent)

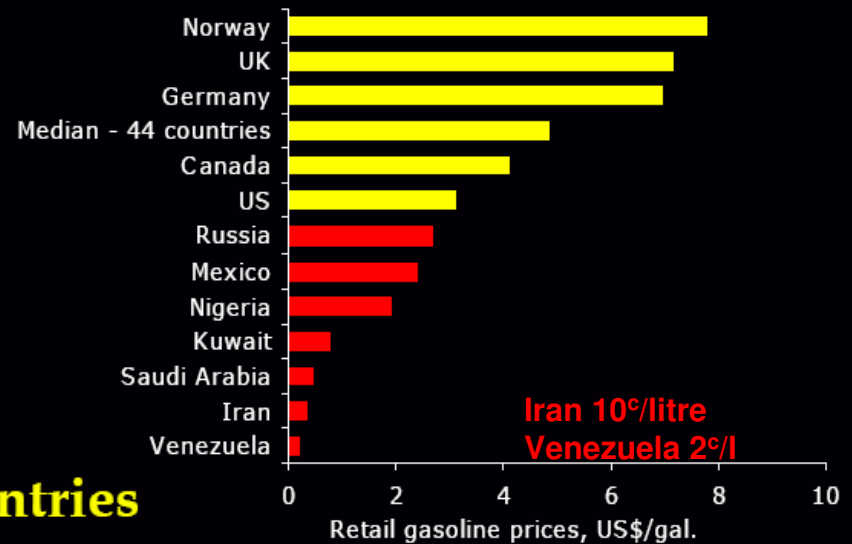
WORLD OIL & GAS PRODUCTION

ASPO 2008 base case

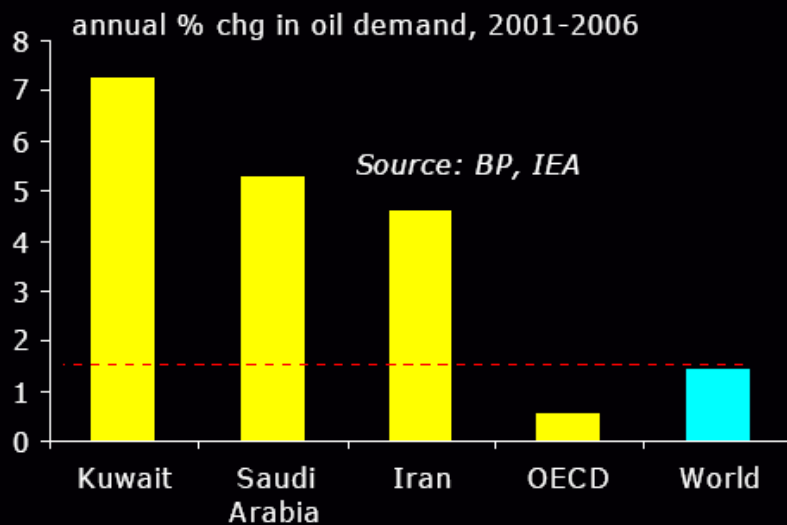




Gasoline Prices Highly Subsidized in Many Oil-Producing Countries



Oil Consumption in Oil-Producing Countries



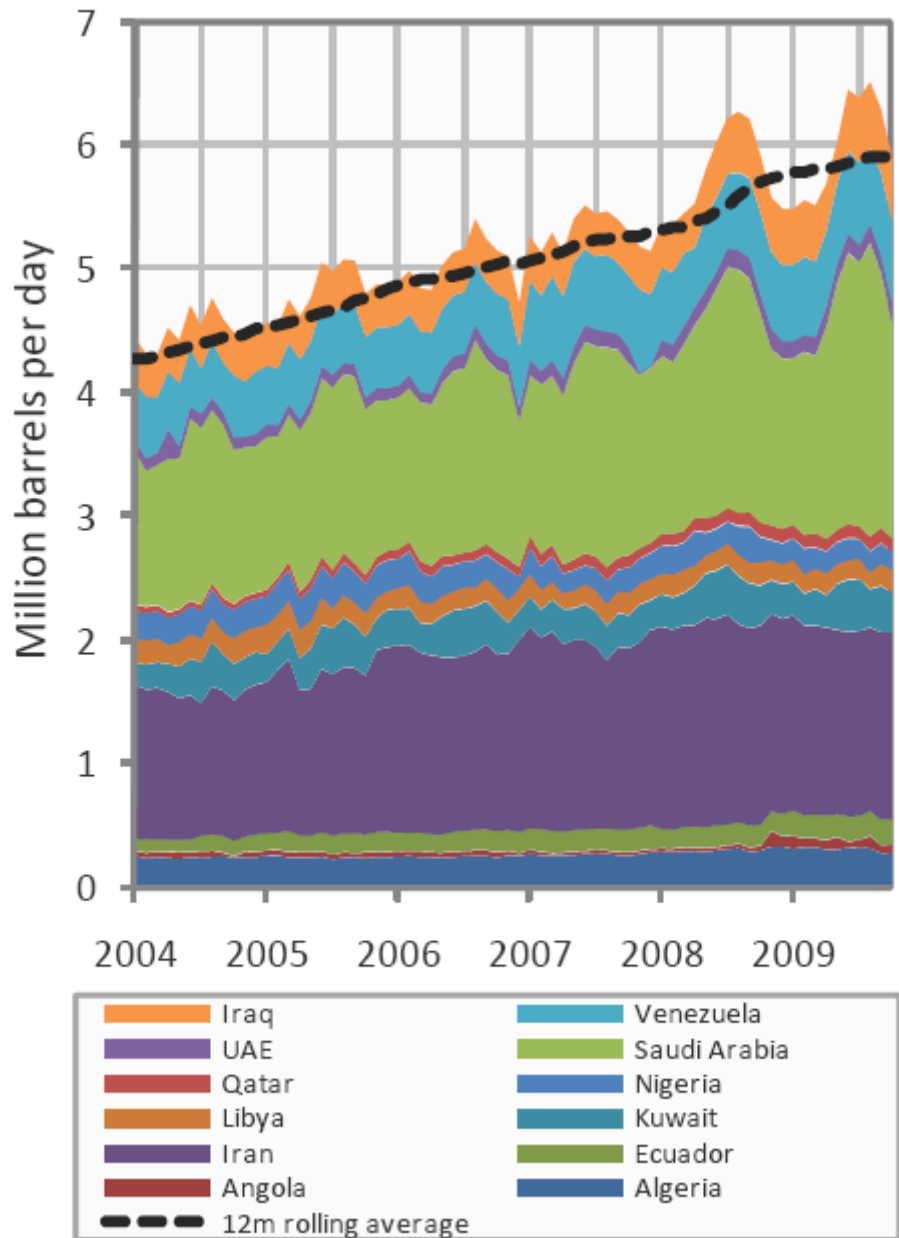
Jeff Rubin

September 2007



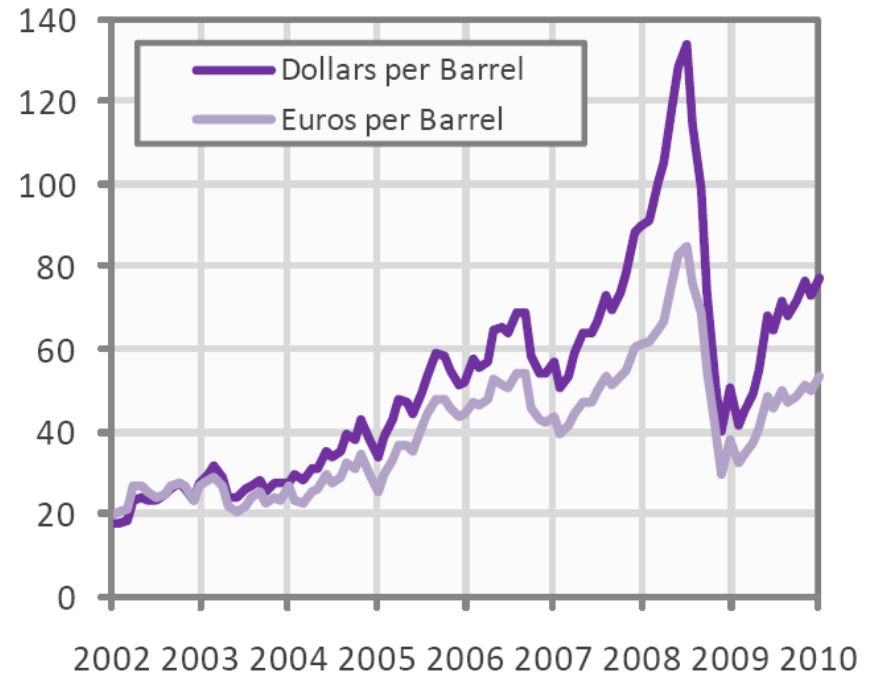
Canadian Imperial Banking Corporation

Chart 17: OPEC Oil Consumption January 2004 - Oct. 2009



Source: Joint Oil Data Initiative

Chart 1: Oil Price Weighed Average of Blends



Source: Energy Information Administration

from Oilwatch Monthly: ASPO-Netherlands
Rembrandt Koppelaar

Is Size Of Oil Markets Too Big To Fail?

- Global petroleum use now $\approx 85+$ million barrels per day.
- This is world's single largest industrial market by factor of several fold.
- Since it is so big, is it like Freddie Mac and Fannie Mae?
- No. Since there are no energy regulators, no audited data and no firewalls.



The world is totally at risk with no insurance policy the Fed has no energy tool box.

The World Is Sleeping Walking Through These Energy Events

- Most global leaders have no idea any of these risks are so real.
- “Peak Oil” as a term is still only slightly understood by America’s political and business leaders.
- Those who warned were called:
 - Alarmists
 - Pessimists
 - Oil Bulls
 - Wolf Criers

It Took Five Months To Melt Down Key Financial Institutions

- Alan Greenspan: “What has just occurred is a once a century event.” (September 15, 2008)
- Bear Stearns run on the bank happened in two days.
- Lehman Brothers finale took four days to happen.
- AIG debacle occurred in two days.
- Too many key financial players kept assuring each other “the worst is behind us” while things “got worse and worse.”



Energy Markets Can Unwind Faster

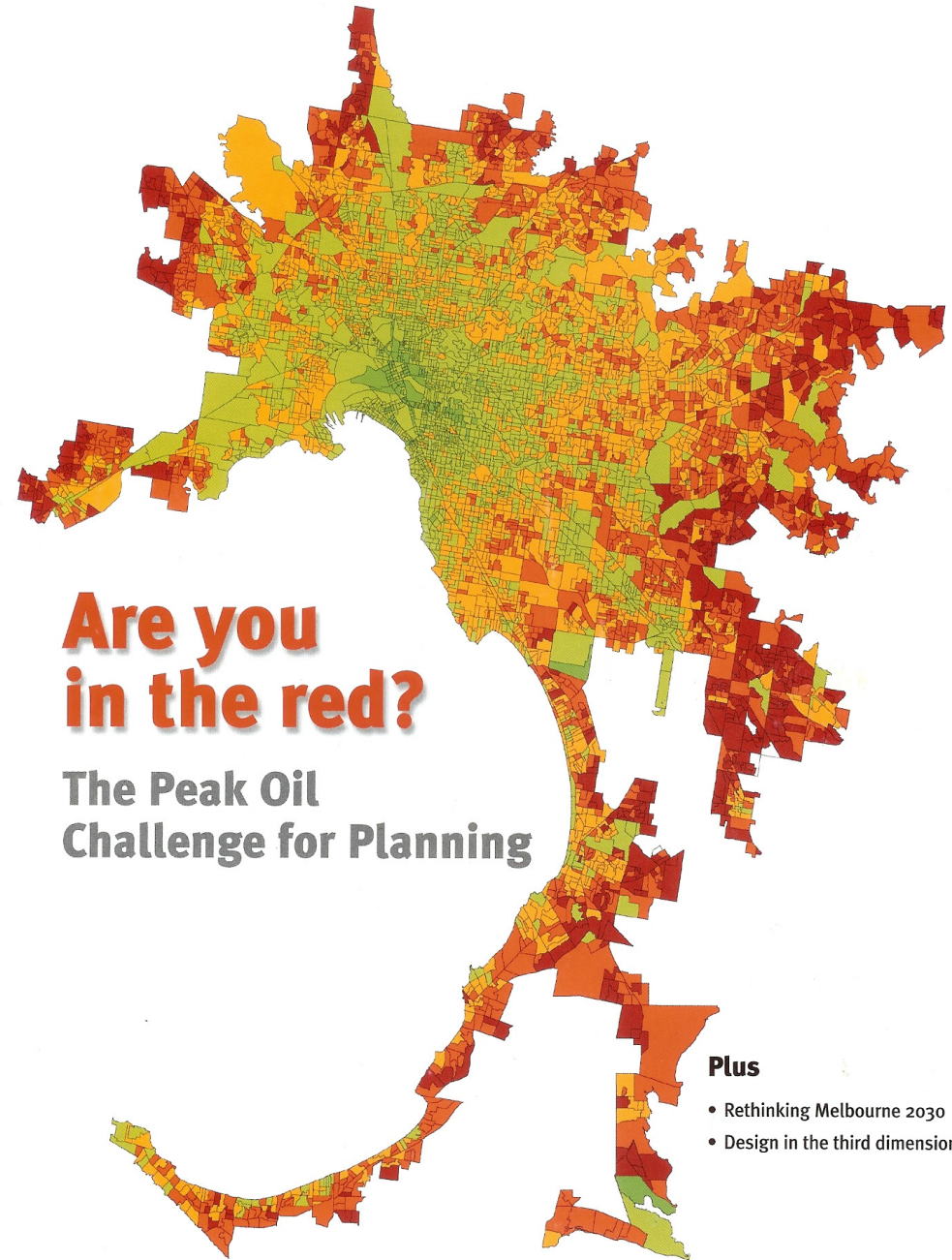
- A global run on the energy bank would happen in less than a 30-day window.
- It will take a “decade +” to rebuild any genuine energy cushion.
- This is the most serious global risk of the 21st century.

RISK IS REAL. Energy risk is real risk²

Planning**News**

Published by Planning Institute of Australia, Victorian Division

Volume 33 No. 8 September 2007

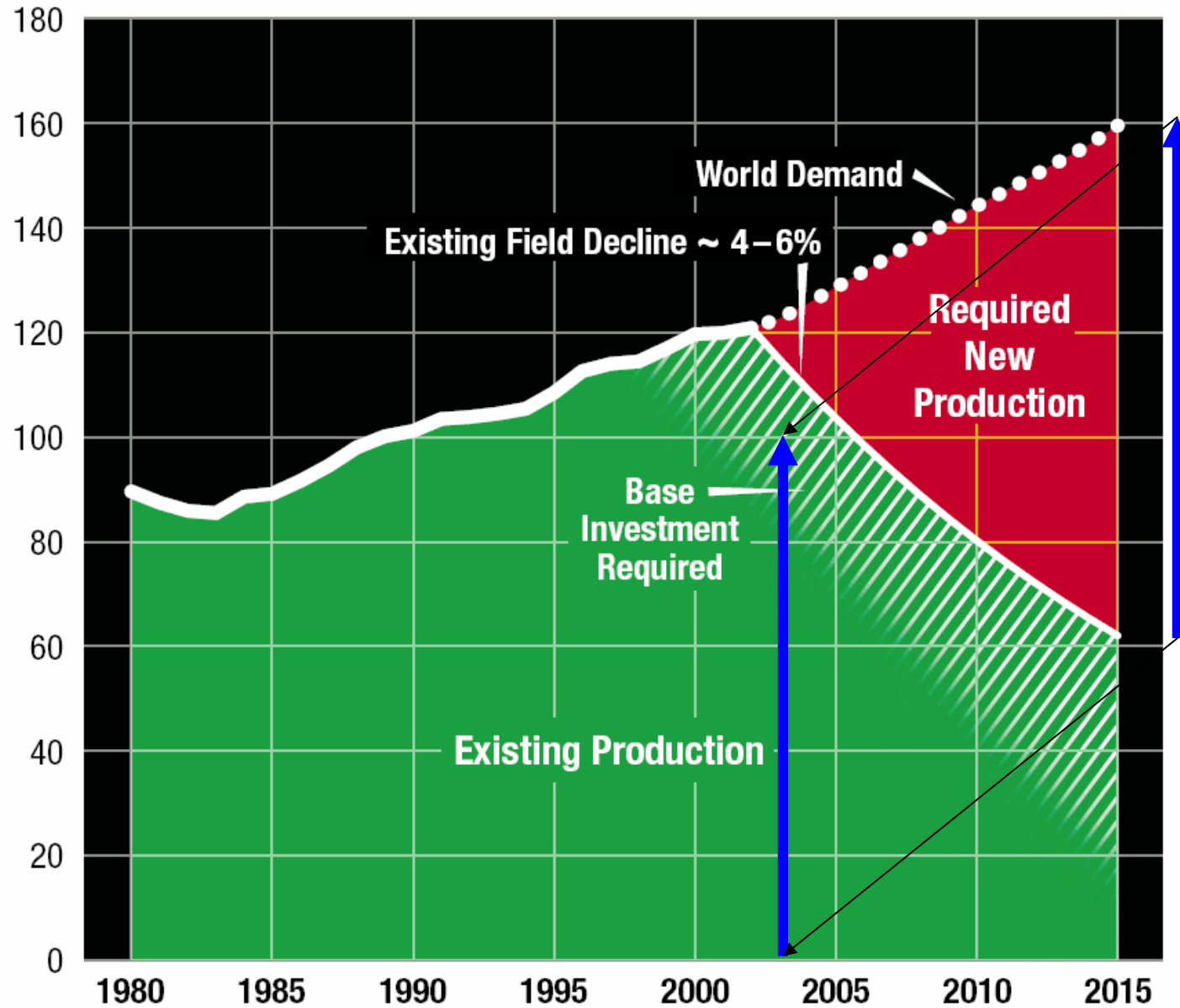


Supplying Oil and Gas Demand Will Require Major Investment

ExxonMobil

February 2004

Millions of Barrels per Day of Oil Equivalent (MBD OE)



By 2015, we will need to find, develop and produce new oil and gas equal to eight out of every 10 barrels being produced today.

Why are oil supplies peaking?

- **Too many fields are old and declining**
- **54 of 65 oil producing countries are in decline!**
- **Oil supply will peak in 2010/2011 at around 92-94 million barrels/day**
- **Oil supply in international trade may peak earlier**
- **Collectively we are still in denial**



Macquarie report September 16th 2009

"The Big Oil Picture:

We're not running out, but that doesn't mean we'll have enough"

Not your average peak oil theory, from Macquarie

September 18, 2009 10:10am by Kate Mackenzie

Financial Times

Mainstream financial analyst types tend to shy away from talking about peak oil -

CALGARY HERALD

Division of Canwest Publishing Inc.

September 17th 2009

Oil surplus peaking this year, bank says

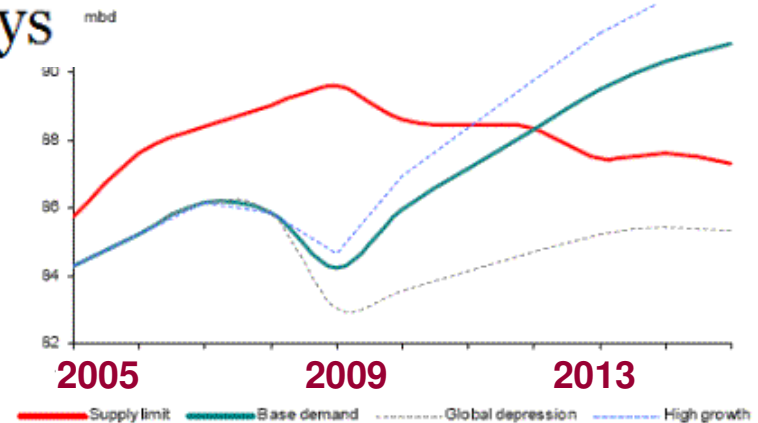
chron.com | News, search and shopping from the HOUSTON CHRONICLE

NewsWatch: Energy
Blogging the business of energy with Tom Fowler

September 16, 2009

Peak oil will occur this year, says Macquarie

Global oil production limits are in sight, demand should again become constrained, oil sands et al will be needed



Source: Macquarie Research, September 2009

THE GLOBE AND MAIL Toronto
• News

Peak oil expected in 2009: Macquarie

Spare capacity of 5.2 million bpd will be wiped out by 2012, Australian bank says

Australia

Actual

Forecast

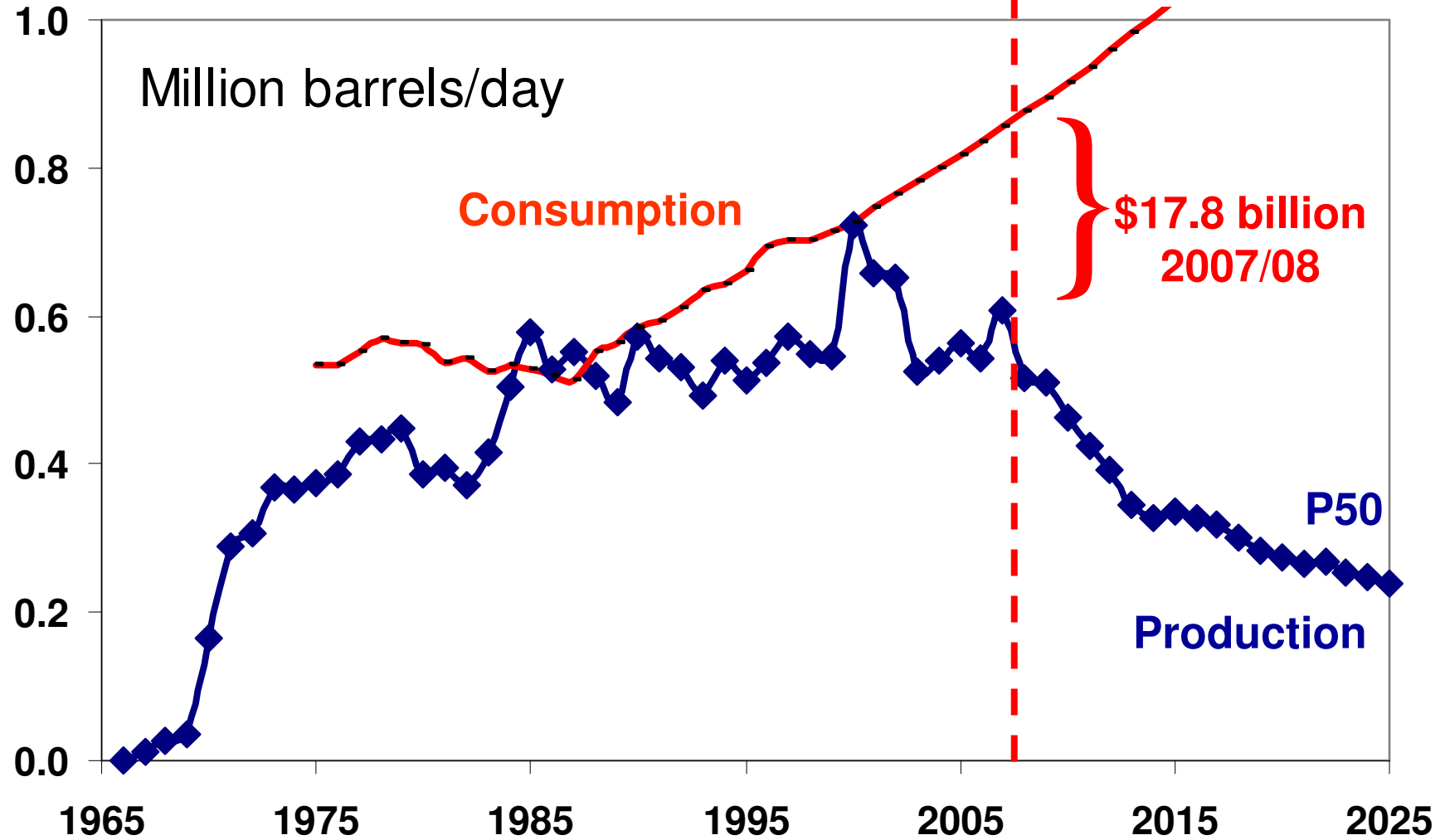
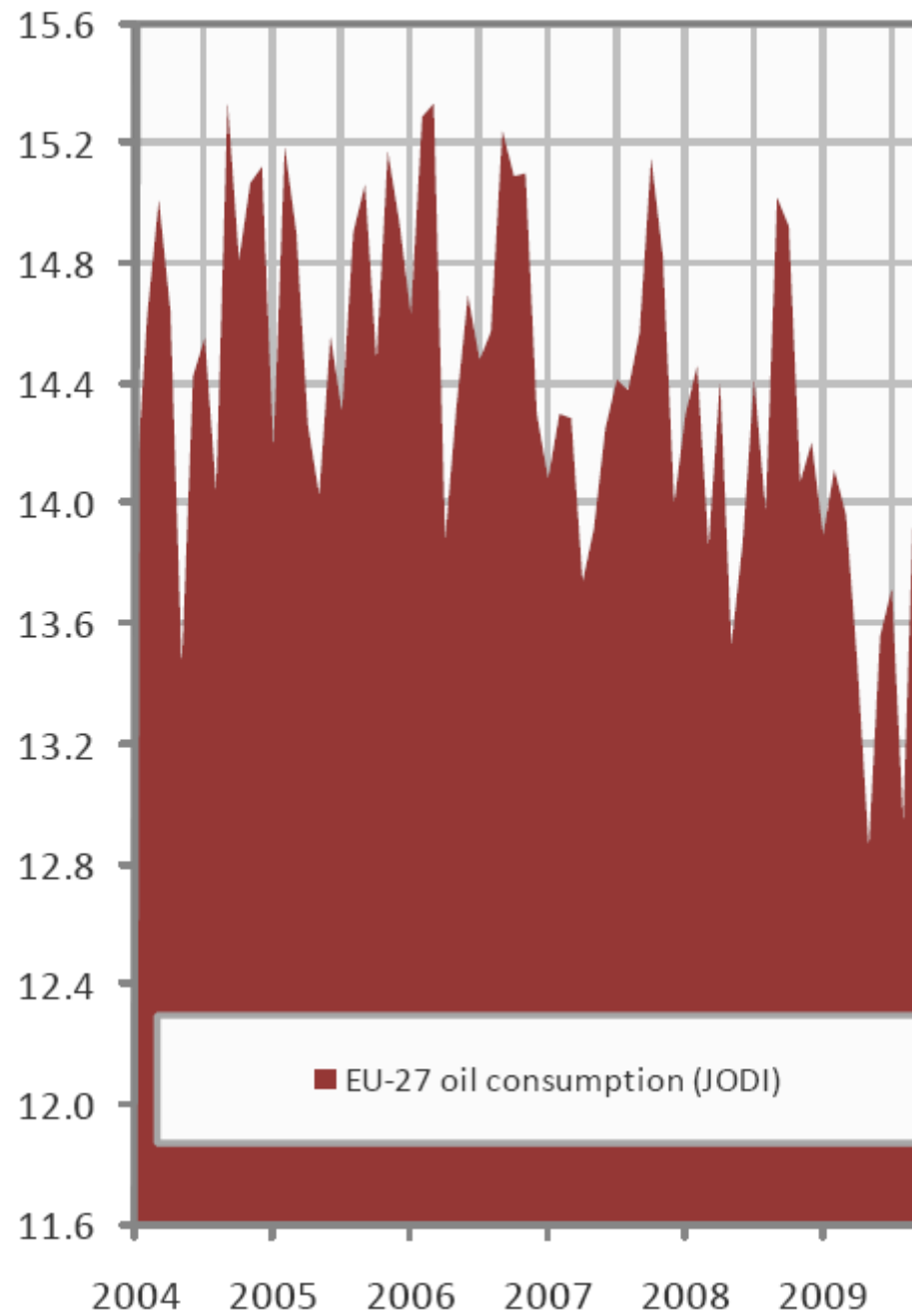


Chart 22: EU-27 Oil Consumption January 2004 - Oct. 2009



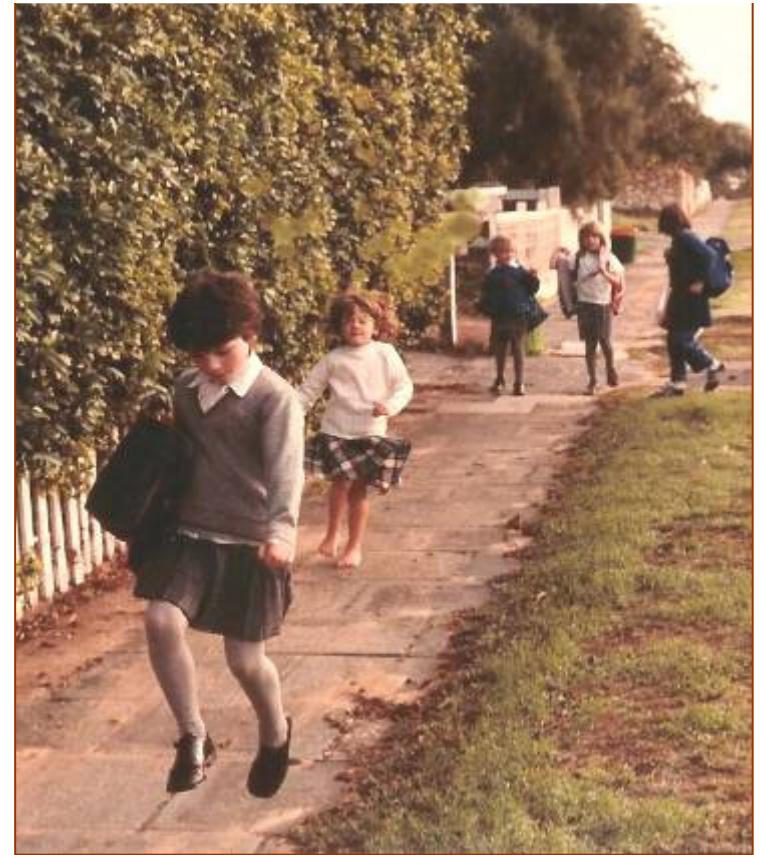
Australia must not let the opportunities slip away

Many of the policy options to reduce fuel usage will also lead to wealthier, healthier and happier communities.

Australia is very well placed globally

- ◆ Big attitude changes in past; to race, gender, smoking, water..
- ◆ World-leading demand management skills
TravelSmart and water conservation
- ◆ Considerable uncommitted gas reserves

Failure to act now will prove incredibly costly



Abstract at www.STCwa.org.au/aspo

See our “**Oil: Living with Less**” policy
Sustainable Transport Coalition www.STCwa.org.au

