Prognosfruit 2008

Adapting to a Changing World

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Projections & Forecasts

- **Projections** simply take the recent events and then find
  - The trend line and
  - Extrapolate this forward into the future assuming none of the fundamentals have changed
- Most newspaper articles are based on projections with limited attempts to forecast
- **Forecasts** take the projections and then adapt them to take account of the changed circumstances and can suggest to us what we can do to change the trend line

Why The Global Context?

- Trade Liberalisation via successive trade rounds but
- Doha now bogged down and
- An increasing tendency towards Bilateral trading arrangements and
  - China has purchased large amounts of assets externally
    - Farm land in neighbouring countries
    - Mineral reserves in Peru
    - Oil reserves all over
    - Announced the building of the trans Africa railway Angola to Dar Es Salaam
  - USA and others looking at bilateral deals also
- But what effects will the following have:
  - Substantial rises in transport costs
  - The need to mitigate the effects of climate change and reduce the “carbon” footprint

July Headlines

- Less **Venezuelan** oil going to US, more to China
  International Herald Tribune – France 01.07.08
  The new figure is its lowest for any four-month period since a 2002-2003 oil strike paralyzed Venezuela's **economy**. State oil company Petroleos de Venezuela **...**
- Bush's Dollar Drop Maps Loss of US Clout at Final G-8 Summit
  Bloomberg – USA 03.07.08
  ... Bush heads to Japan next week for his final international summit with diminished leverage as **Russian** and Chinese influence grows. ``Between the **economic ...**
- G8 plus 5 equals power shift
  The Australian - Sydney, Australia 06.07.08
  But because of their rising economic power, their huge hunger for energy and food and their critical role in deciding a new **climate change** regime - or not **...**
- Mideast Gulf: Producers consider dollar change
  Petroleum Economist - London,England,UK
  While the US is cutting interest rates to cope with a slowing **economy**, the booming Gulf is grappling with an inflationary bubble that requires much tighter **...**

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Population living in A City %

Region	1950	2000	2030
World	30	47	60
Africa	15	37	53
Asia	17	38	54
Europe	52	73	81
Latin Amer/Carib	42	75	84
North America	64	77	85
Oceania	62	74	77

Changing Dietary Needs

- 1.1 billion people live on less that 50p/day; 75% of them suffer under-nutrition and hunger (calorie deficit).
- 2.7 billion people live on less than £1/day
- by £1 per day, most hunger (calorie) problems solved, but not malnutrition.
- Between £1 and £5 per day people eat more meat, dairy products, fruits, vegetables & edible oils, causing rapid growth in demand for raw agricultural commodities.
- Meat uses more land to produce the same amount of calorific intake than crops
- After £5 per day, people buy more processing, services, packaging, variety, and luxury forms, but not more raw agricultural commodities.

Increasing Global Food demands

- By 2050 the predictions are that world food demand will double as a result of
  - Increasing world population (50%)
  - wealthy lifestyle (50%)
- World Bank estimates would suggest that the number of people in developing countries in households that have incomes above £8,000 per annum will rise from 352 million in 2000 to 2.1 billion by 2030.
- Current trends in bioenergy production could add as much to the demand for increased production as the needs for additional food
- This would mean that in 40 years we would have to triple total food production from a shrinking area of cultivatable land

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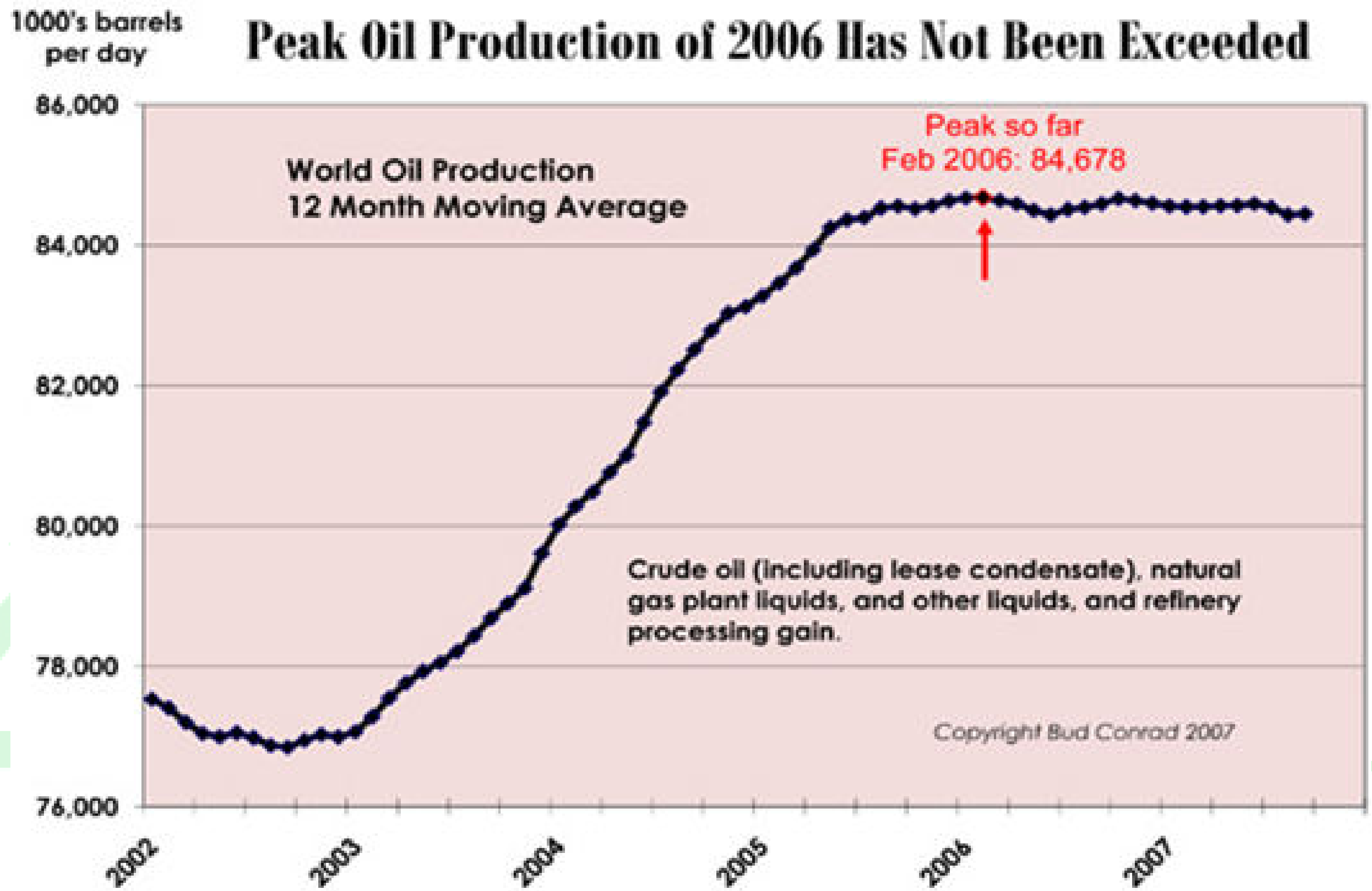
Brent Crude Oil Prices 2007/08

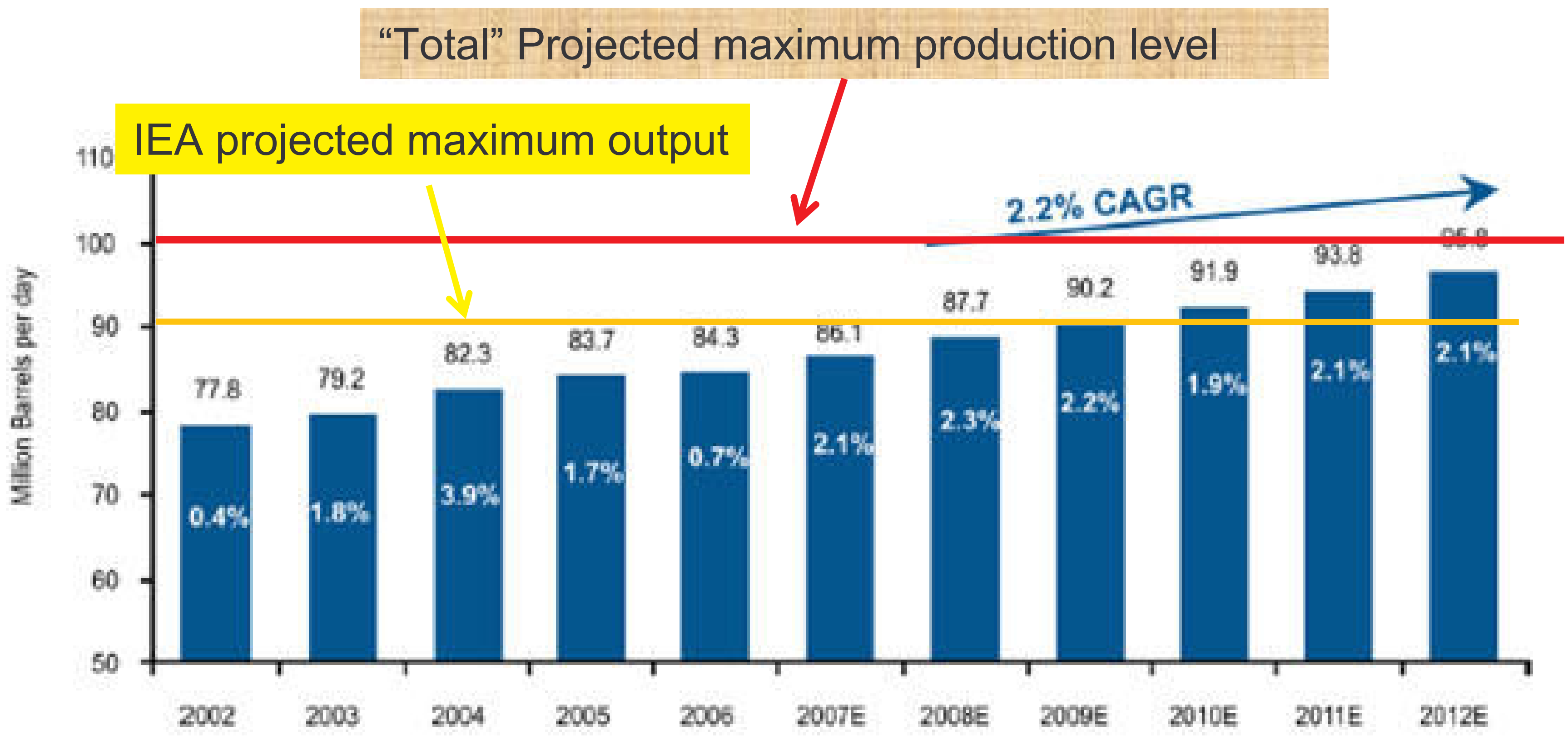
Oil a finite resource?



And where is that oil supply?

- World reserves are finite
  - We are at or close to peak oil production
  - 2030 demand predicted on current trends at 120 million tonnes pd
- Conventional oil reserves 1.75 x 10^{12} bbl
- Tar Sands & Shales currently represent around 2/3rds of total oil reserves found principally in
  - Canada: Athabasca Tar Sands 1.7 x 10^{12} bbl
  - Venezuelan Ormoco Tar Sands 1.8 x 10^{12} bbl
- Environmental Extraction Cost of tar Sands
  - In Canada they cover 140,000 Kms^2
  - High water usage to extract
  - High energy cost to extract

IEA Predictions in Growth in Oil demand against supply



Source: International Energy Agency

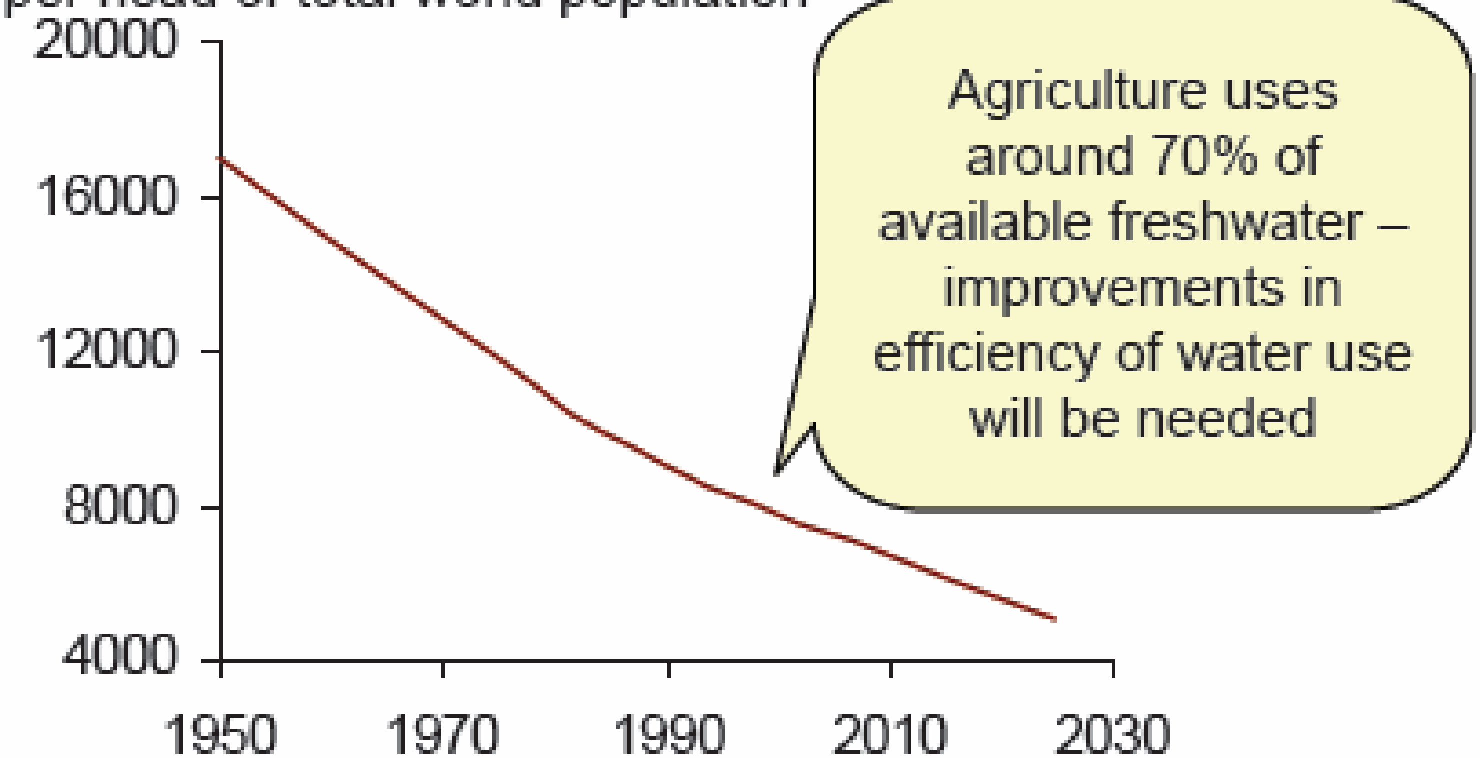
Climate Change In Europe

- Depends on the maintenance of the Gulf Stream: if it moves we are on the same line of latitude as Quebec
- In the north there will be
  - Milder winters
  - Hotter summers
  - More frequent flooding
  - More coastal erosion
    - Dutch sea defences will come under severe threat
- In the south there will be major problems with water supply from
  - Lower rainfall
  - Much drier summers
  - Disappearing glaciers feeding the southern flowing rivers
- Crop Productivity is likely to
  - Increase in Northern Europe
  - Decrease in South East Europe and the Mediterranean

Climate Change effects

The amount of fresh water available for each person is expected to continue its decline

Actual and projected freshwater availability, cubic metres per head of total world population[1]

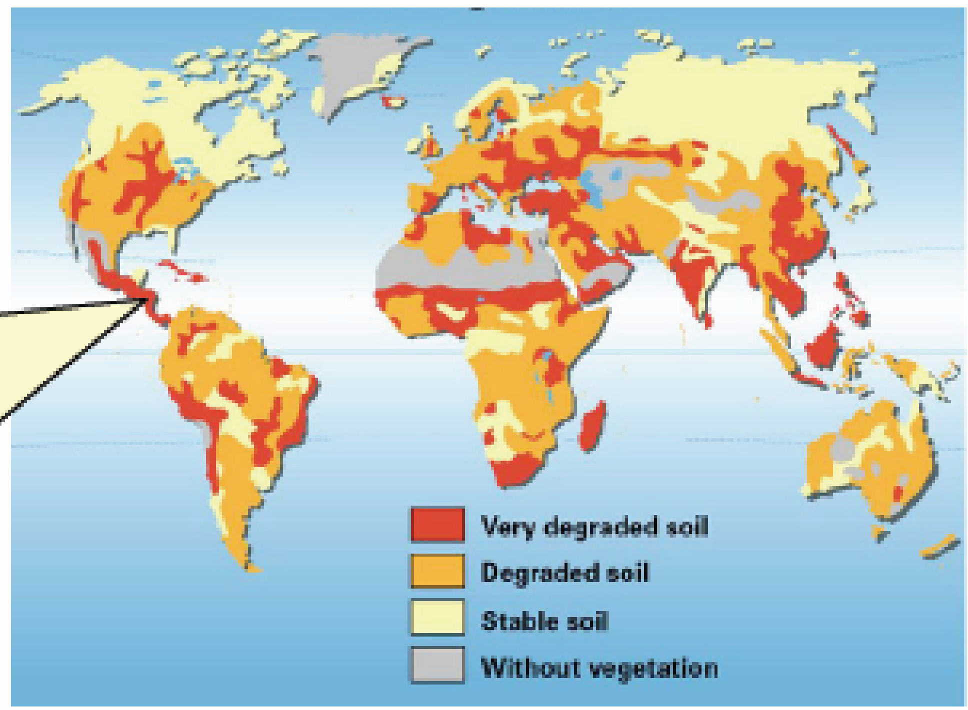


UNEP (2002)

Declining Land Availability

It has been estimated that as much as 50% of the world's arable land may be unusable by 2050

State of world soils[2]



It has been estimated that as much as 50% of the world's arable land may be unusable by 2050,overirrigation and overgrazing being contributory factors

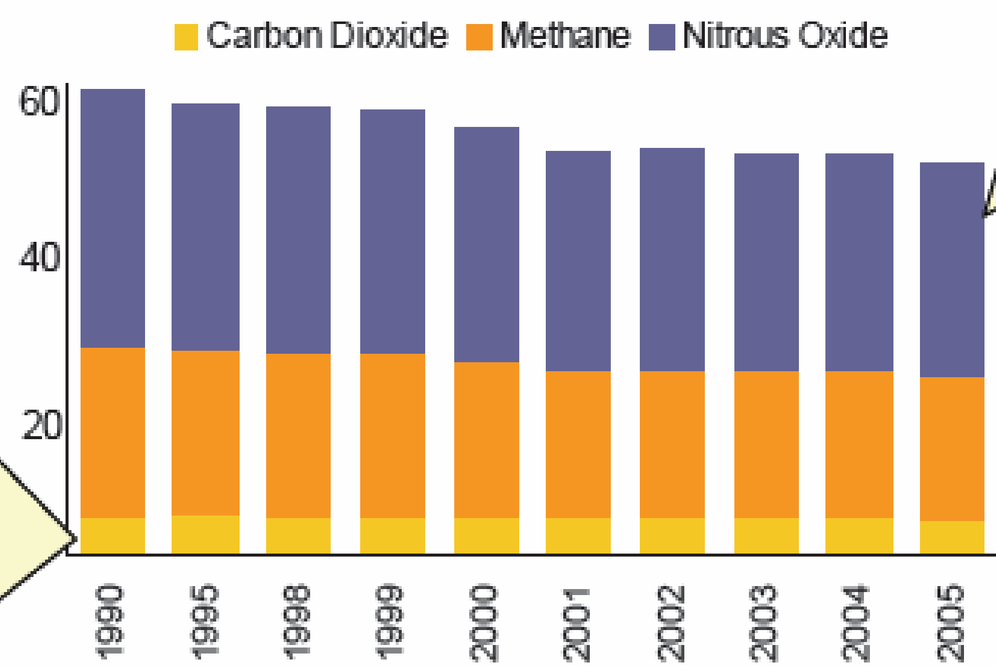
UNEP (2002)

Greenhouse gases and farming

Emissions from agriculture are dropping but methane and nitrous oxide present a major challenge for the future

Agriculture emissions, million tonnes CO_2 equivalent[2]

A disproportionate amount of CO_2 emissions are from fossil fuels burned to supply energy used in 'protected horticulture' - tomatoes, cucumbers, peppers etc. that are grown in glasshouses to be available all year round



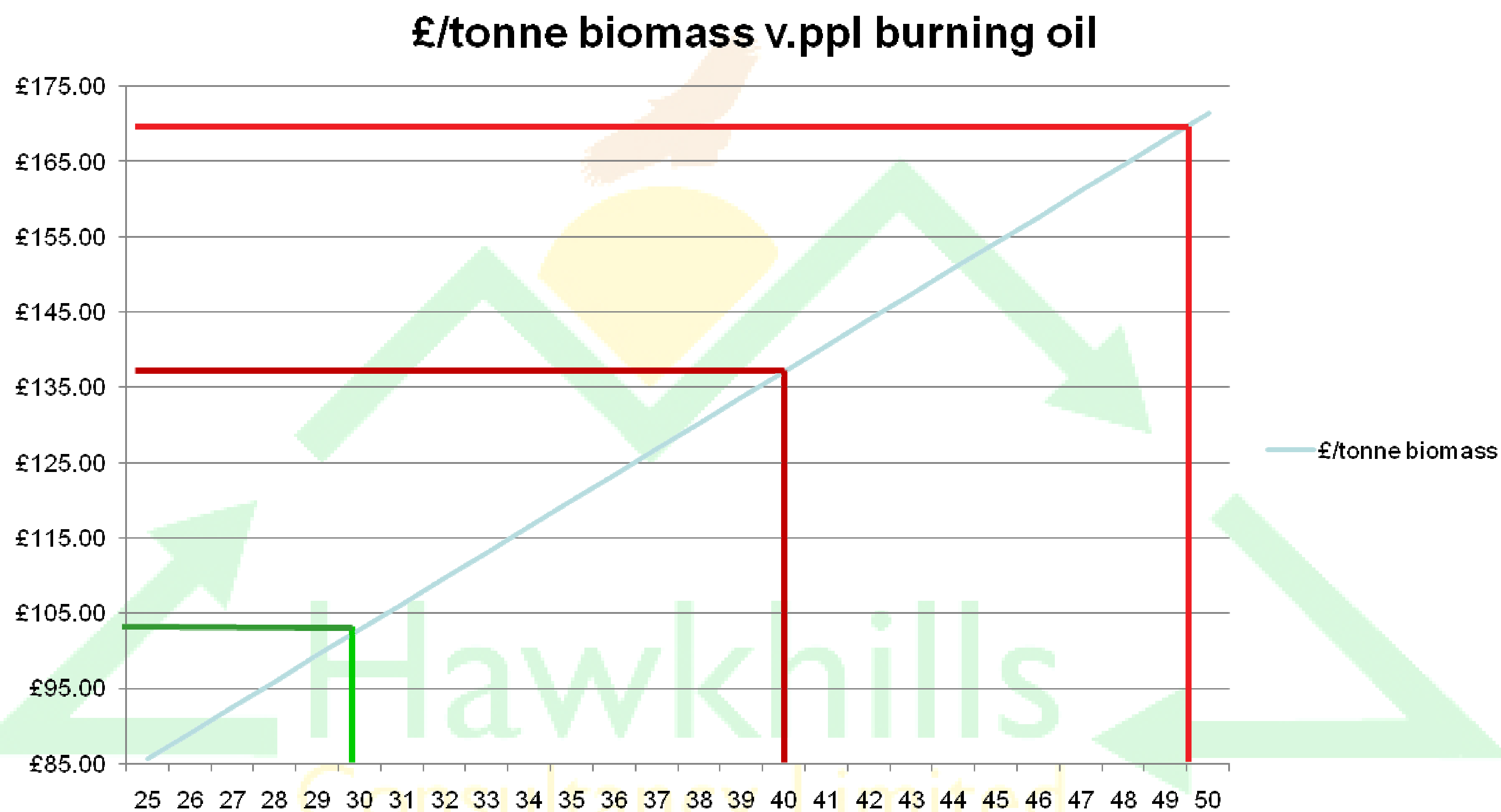
Nitrous oxide is emitted from the soil during the breakdown of organic matter and nitrogen fertilisers

AEAT (2006), *Greenhouse Gas Inventories for the UK 1990 to 2005*;

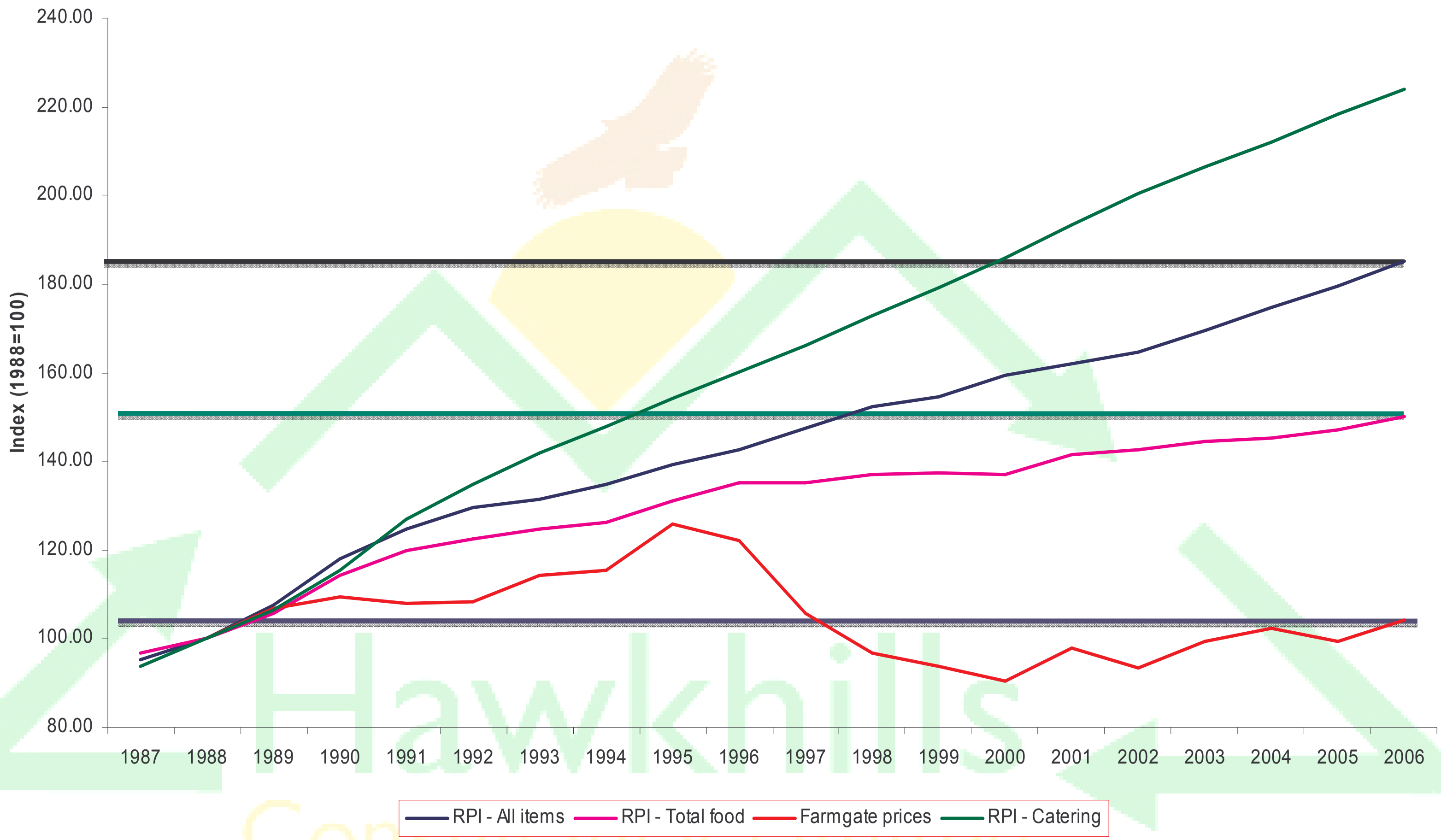
And For Food V Fuel

- The intrinsic energy value of food will increasingly underpin the value of crop products
- In general crop products all have the same energy content at 18GJ per tonne (oilseed rape 19 GJ per tonne)
- So as oil prices rise then the energy underpinning value rises irrespective on the demand for the product
- So there is a tension between the two BUT
- NGOs have argued in the past that low commodity prices depressed by the CAP have damaged 3rd World Countries
- Price rises in basic food commodities have the *potential* to benefit 3rd World Countries more. The issue is more about who gets the cake
  - The 3rd world farmer or
  - The global corporations

Burning Oil v Biomass



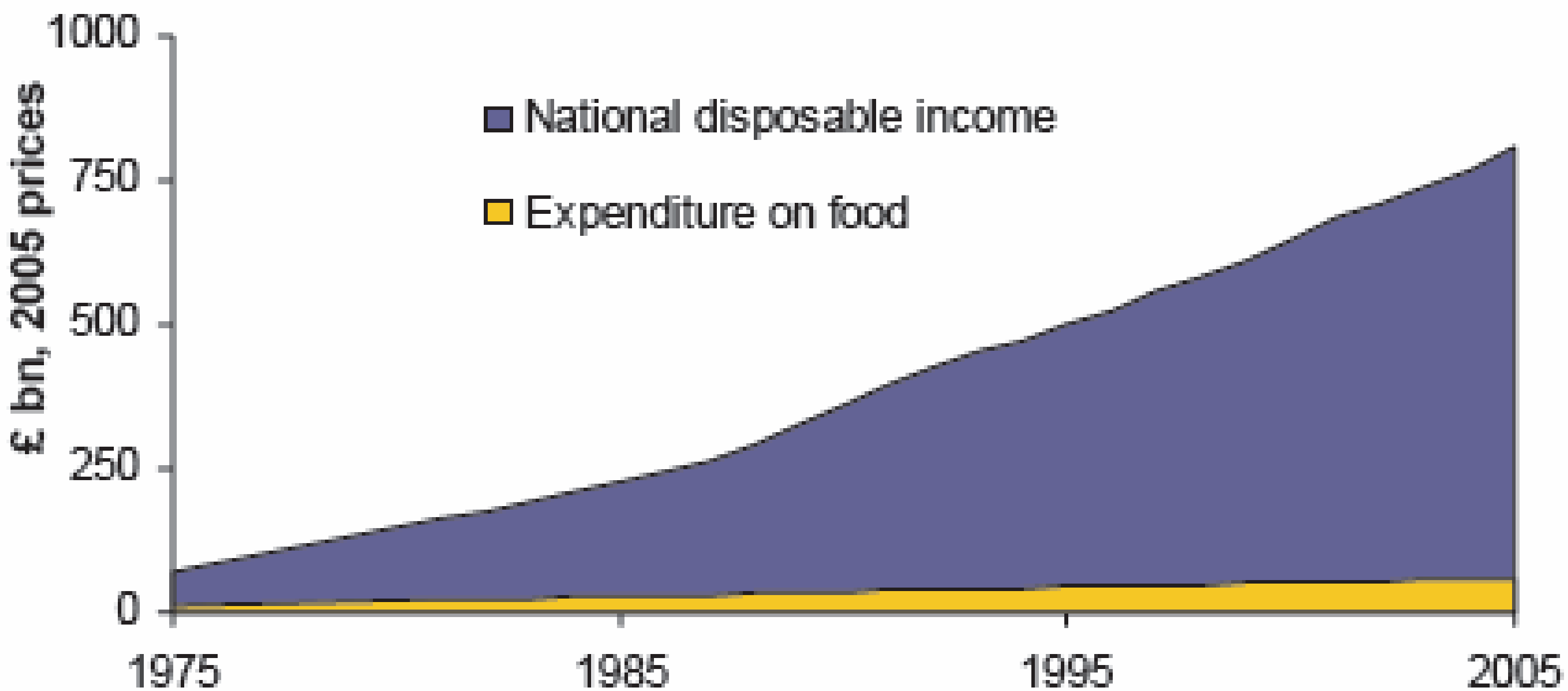
Inflation Figures



Disposable Income

UK spending on food has increased 5-fold in 30 years while national disposable income has increased 12-fold[1]

Comparison of gross disposable income and expenditure on food, UK, current prices

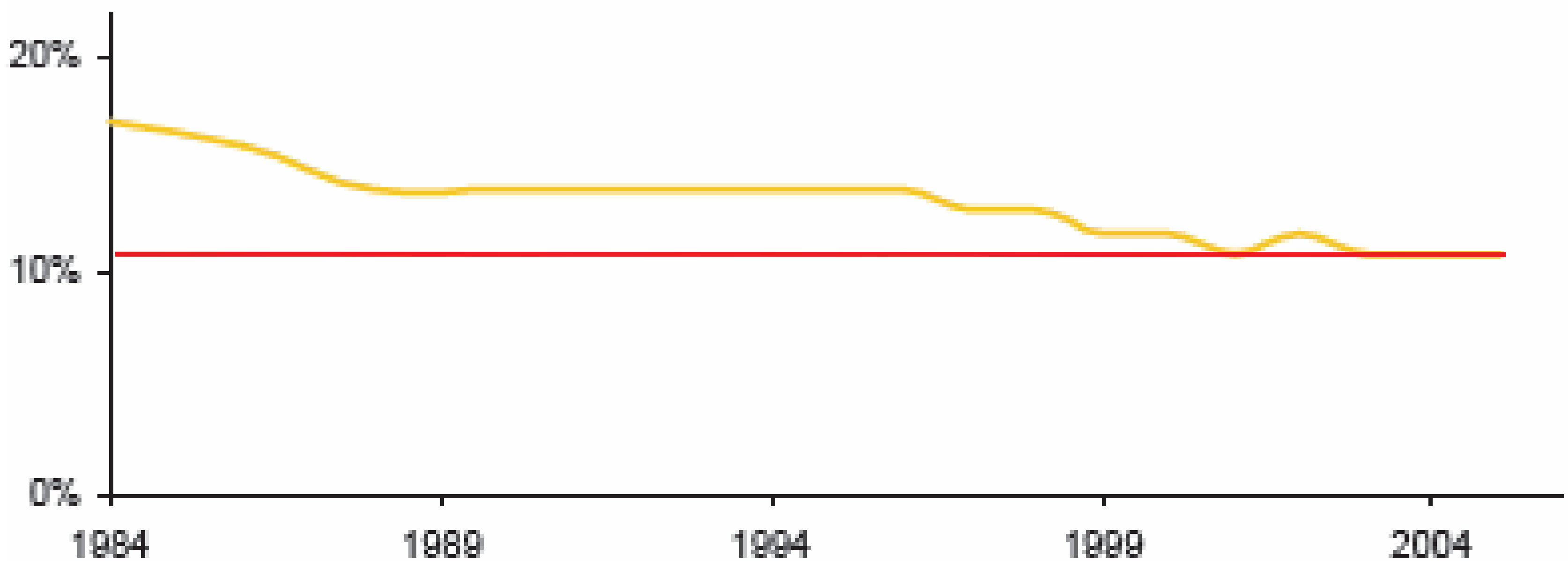


ONS *Household sector: Use of Disposable Income Account*, ONS (2007) *Consumer trends 2007*;

UK Food Spend

So the average share of gross income spent on food is now lower than ever before

% Gross income spent on food in UK at 2005 prices (£)[1]

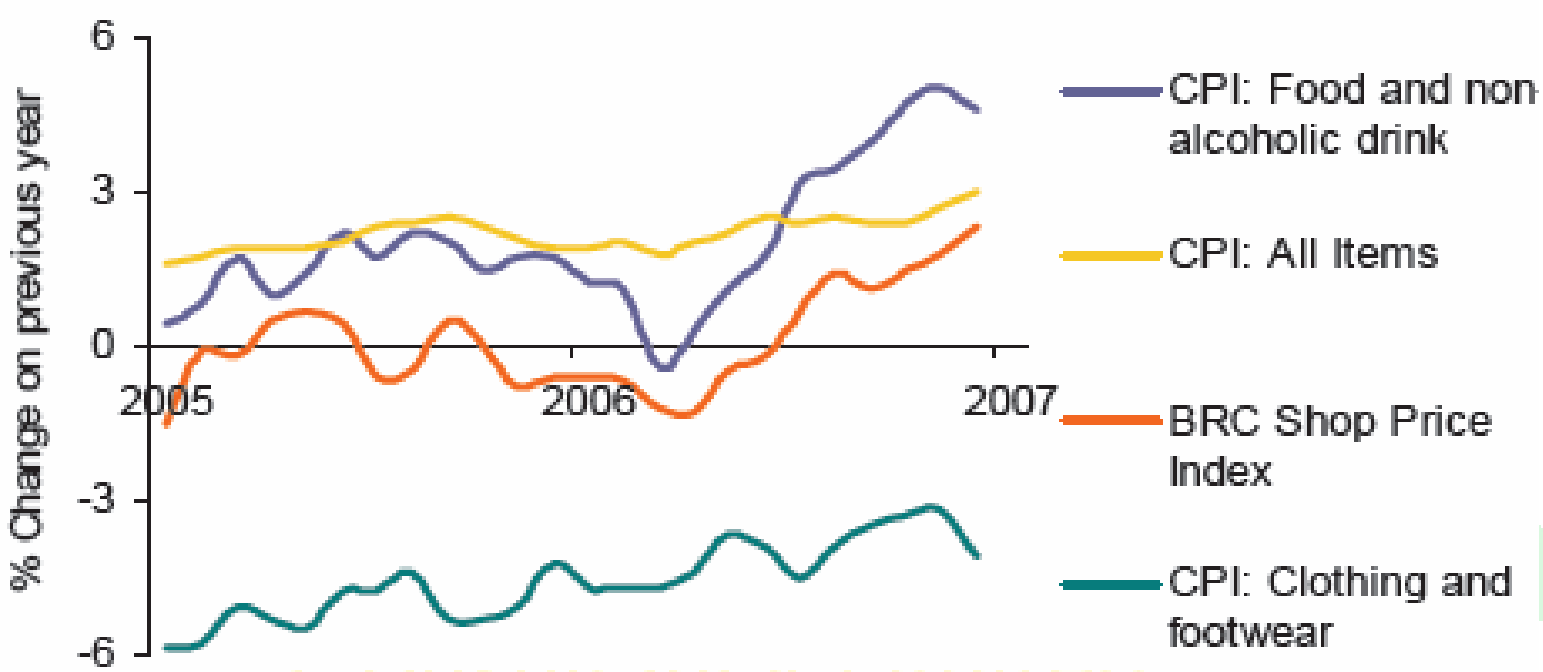


ONS *Household sector: Use of Disposable Income Account*, ONS (2007) *Consumer trends 2007*

2007 changes the trend

Over the past year the CPI basket of food prices has risen, putting upward pressure on overall inflation in the economy

Changes in Consumer Price Index (CPI), and British Retail Consortium (BRC) Shop Price Index 2005-2007[3]



1: Defra (2007) *Family Food in 2005-06*; 2: DWP (2007) Households Below Average Income (HBAI) survey and Defra (2007) Low income households' Household Reference Person (HRP) have incomes in the lowest quintile; the reverse applies to high income households; 3: Nielsen (2007) *State of the Nation*

So what does this mean for you?

- The pressures for change are without recent parallel
- Within 10 years the consumer will not be able to assume a given right to all attributes of **cheap, safe, consistent quality food** produced to a **high environmental and welfare standard**
- We will need to take more responsibility for our own actions in
  - Waste mitigation
  - Energy efficiency
  - Individually and communally
- The energy content of the crop will underpin the value of the product rather than artificial intervention actions
- “Local” supply increases in importance as a way of reducing cost and carbon footprint

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What are the Issues?

- We need to learn to live within our means
  - "One Planet" living is not an optional extra
  - The status quo is no longer an option even for today
- What are the effects for farming and horticulture?
  - Correction of commodity prices against the long term trend
  - Above trend food inflation for the foreseeable future
- Need to adapt to
  - higher energy based input costs
  - Changed consequences arising from climate change
    - Water availability
    - Changed pests and diseases
  - Lack of awareness of the implications of this by legislators

Conclusions

- Population growth and successful poverty reduction has the potential to double global food demand by 2050.
- Growing demands for forest products and biofuels add to this claim on the world's agriculture resources.
- Climate Change will increasingly constrain our ability to produce from land
- Financial power will move from the USA to a wider power base
- Control of finite raw material resources becomes a critical factor and specifically in terms of security of supply of
  - Energy
  - Food

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So is it all Doom & Gloom?

- Not necessarily, but only if we move away from projections to forecasts and anticipate what actions are needed NOW, and ONLY IF
- Our Leaders, nationally and locally are prepared to take some hard decisions which may have short term unpopularity
- We recognise that we need to react to the changing world order and turn to advantage
- Dramatic increases in yield will be needed to
  - create this new supply
  - And to minimise the unit "carbon" footprint