Global & UK Energy Supply *the Developing Situation*

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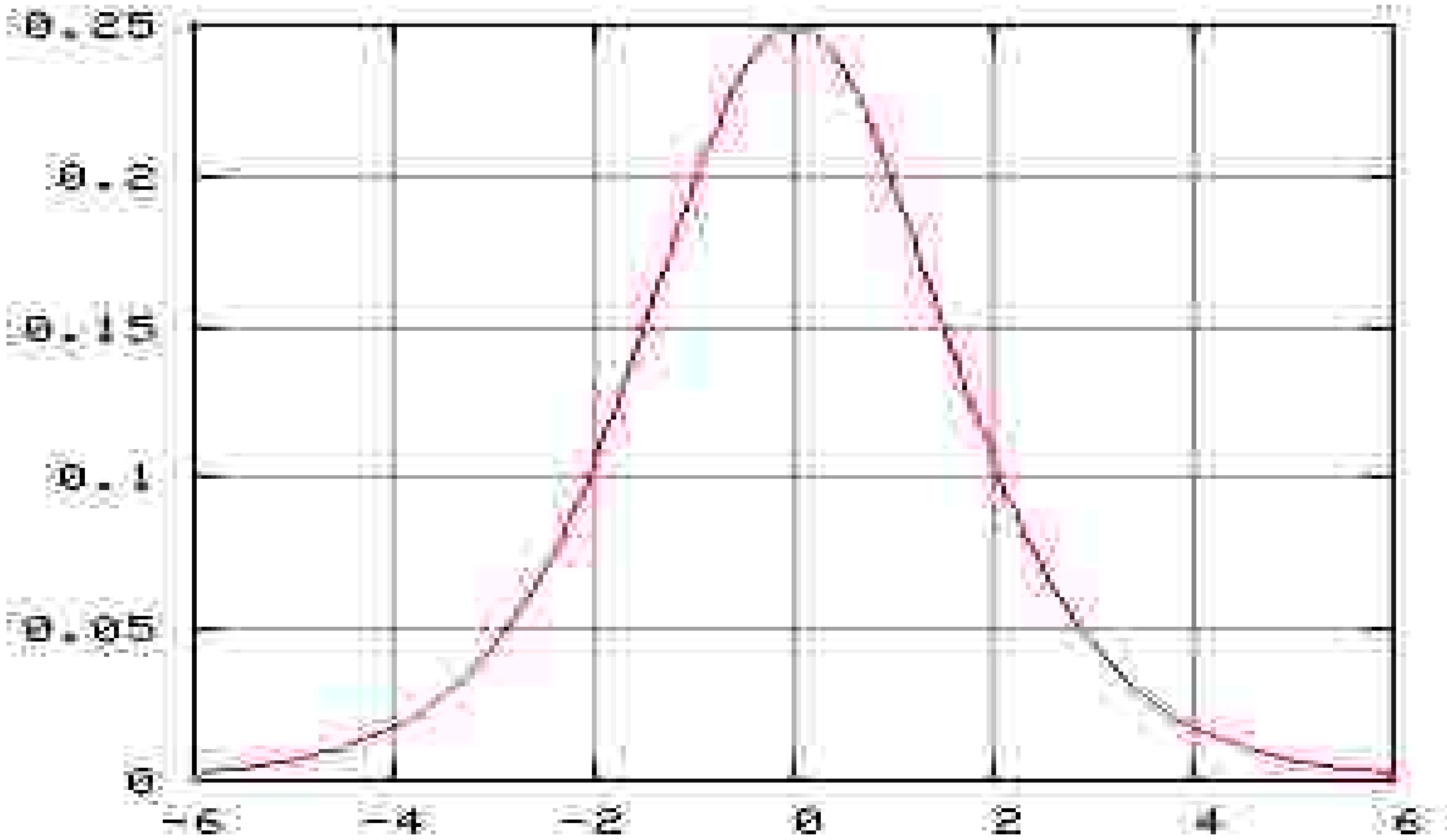
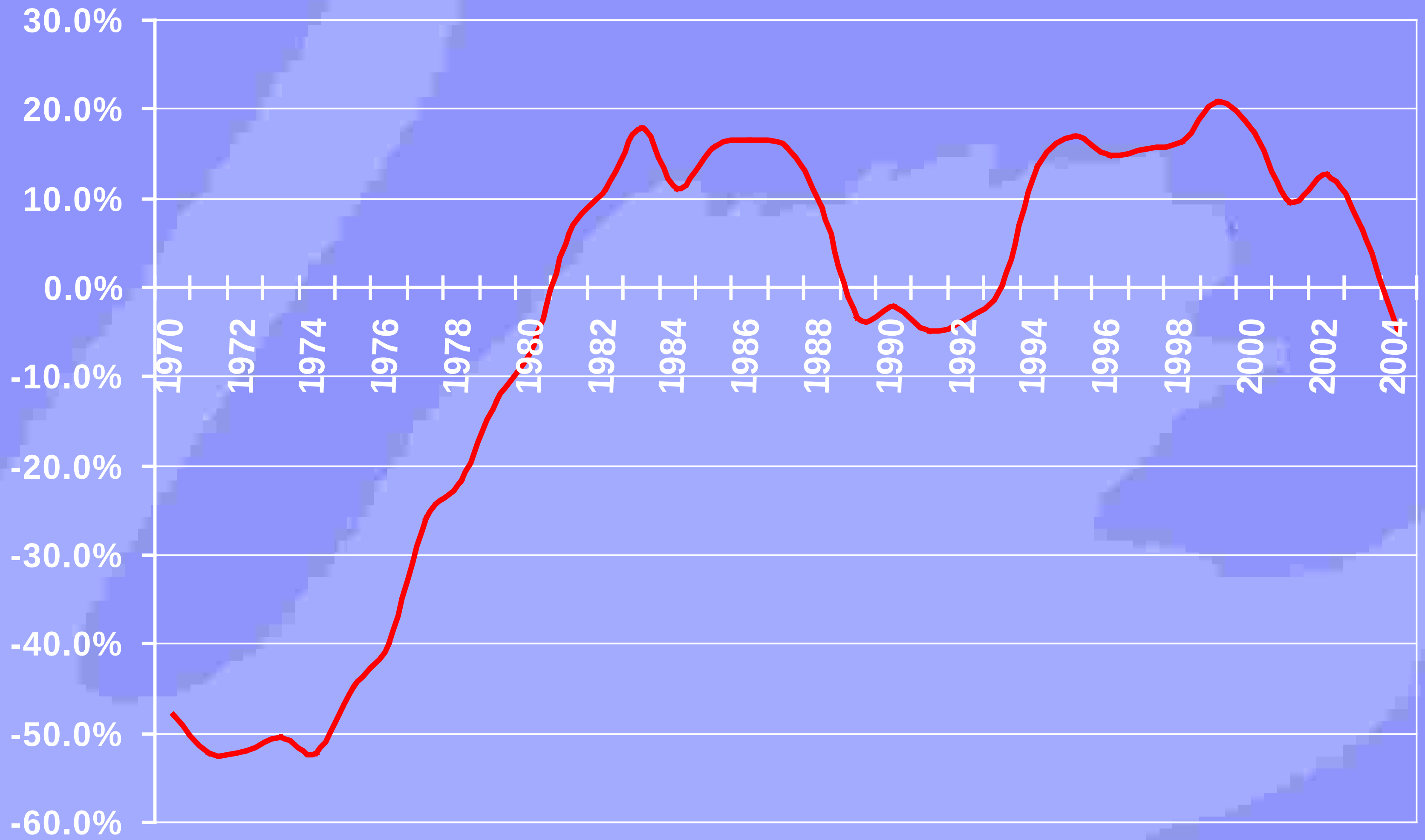
Agenda

- Review of what I said last year
- What has changed and how
- Revised global energy supply outlook
- Revised implications for the UK
- Conclusions

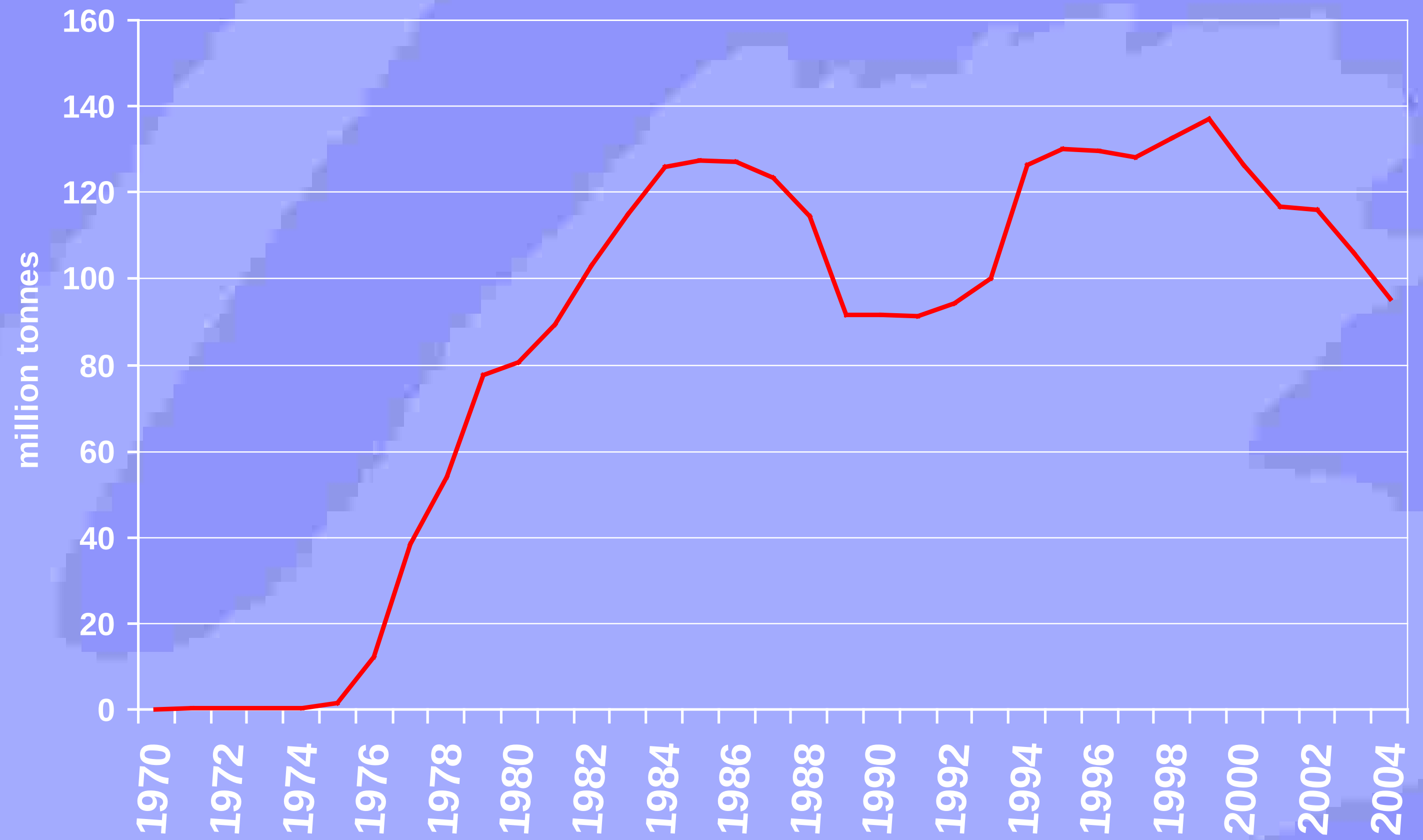
Depletion



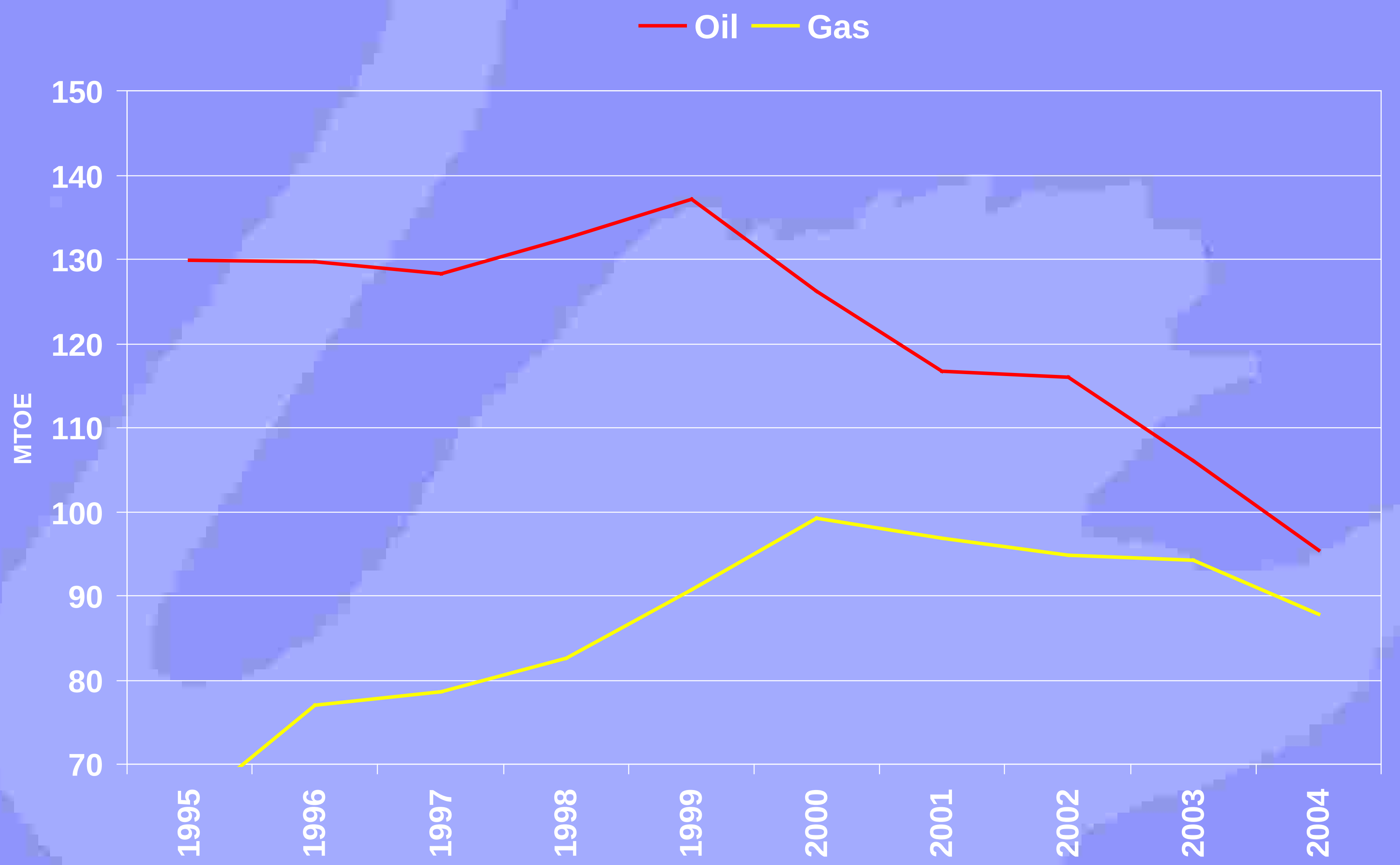
UK Energy Exports



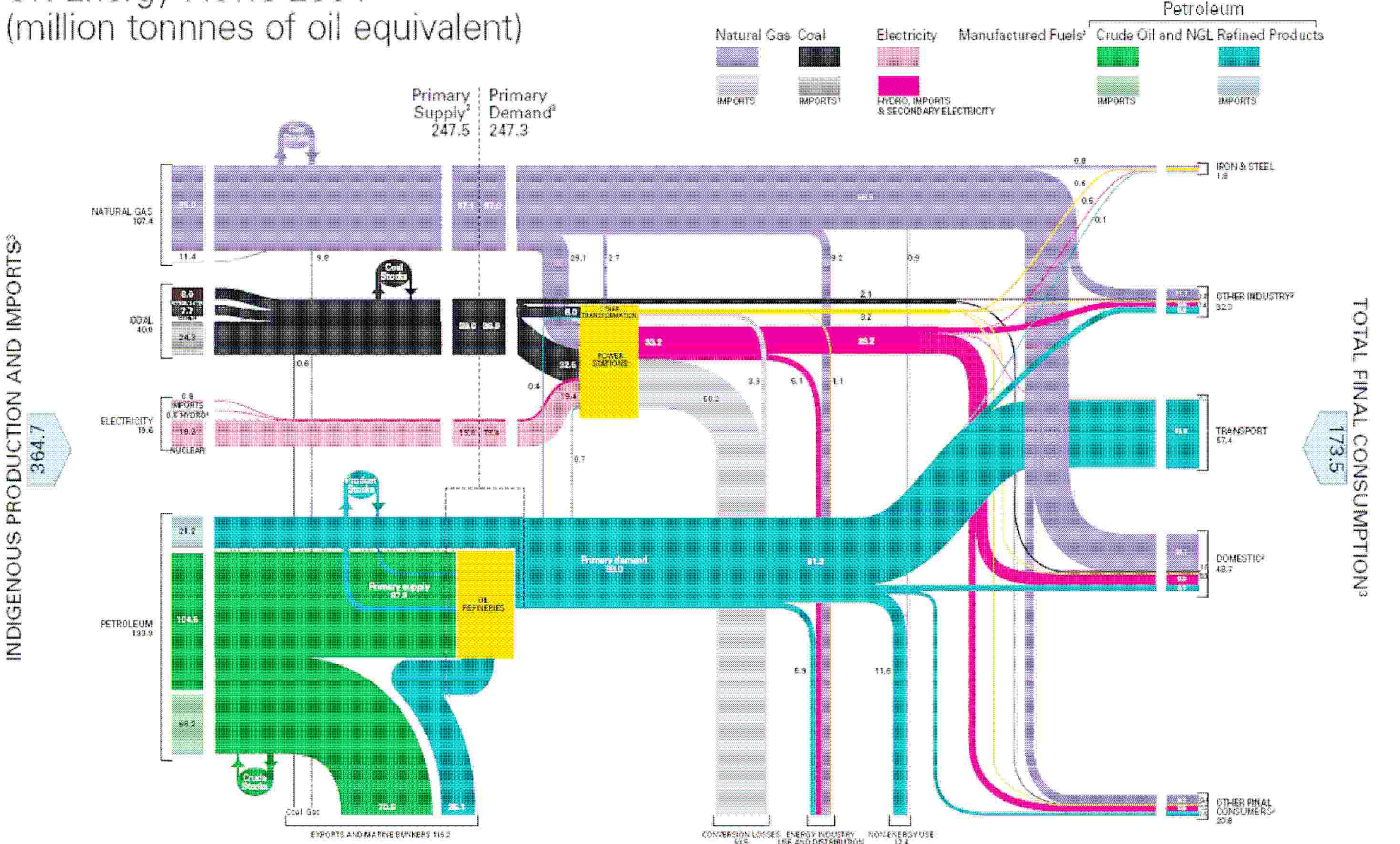
UKCS Oil Production



UK Oil & Gas Production



UK Energy Flows 2004
(million tonnnes of oil equivalent)



FOOTNOTES:

1. Coal imports include imports of manufactured fuels, which accounted for 0.1 million tonnes of oil equivalent in 2004.
2. Includes heat sold.
3. Includes all renewables.
4. Includes wind, wave, geothermal and solar.

This flowchart has been produced using the style of balance and figures in the 2005 UK Digest of Energy Statistics, Table 1.1.

STATISTICS

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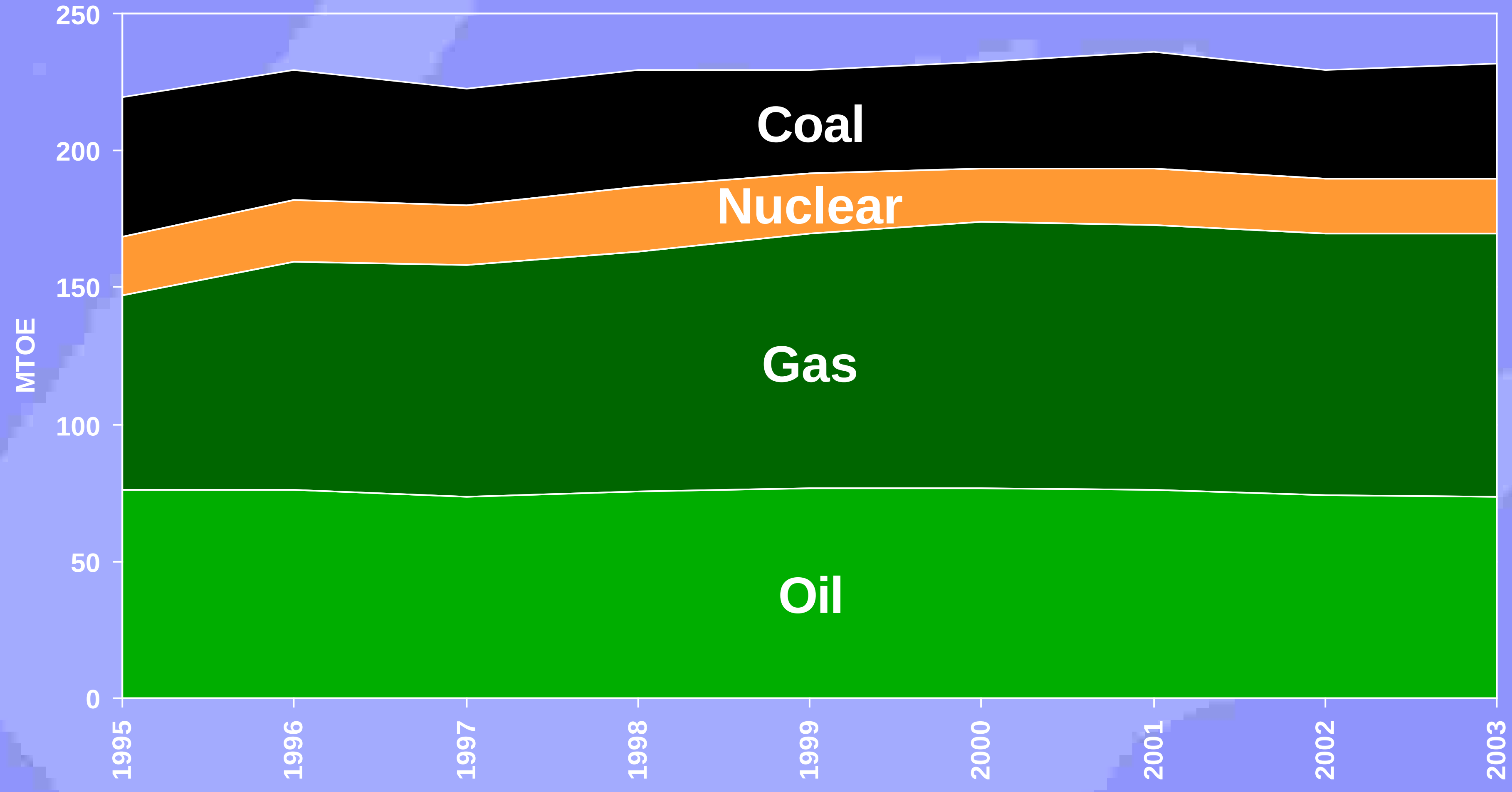
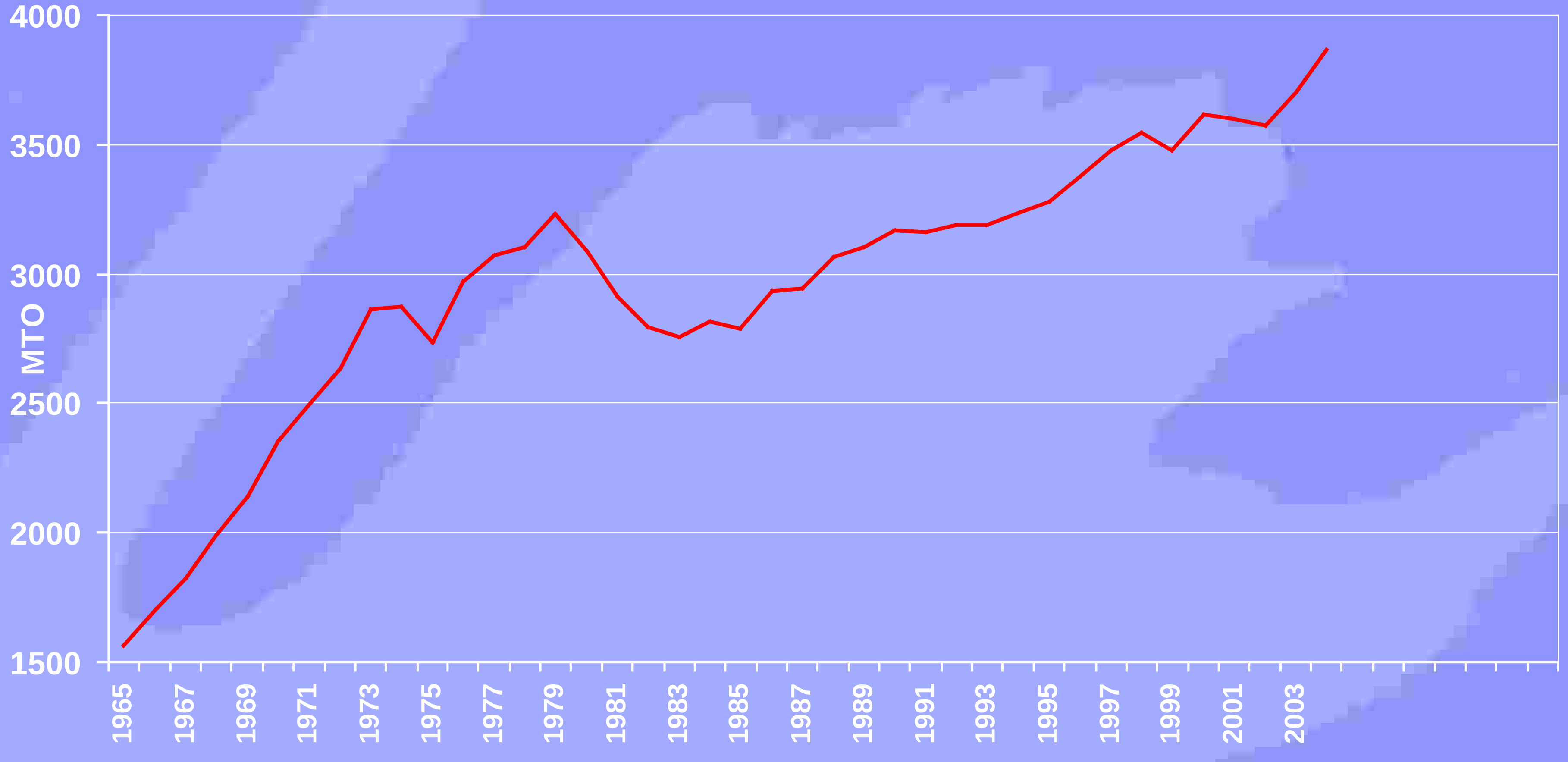
ENERGY FLOW CHART 2004

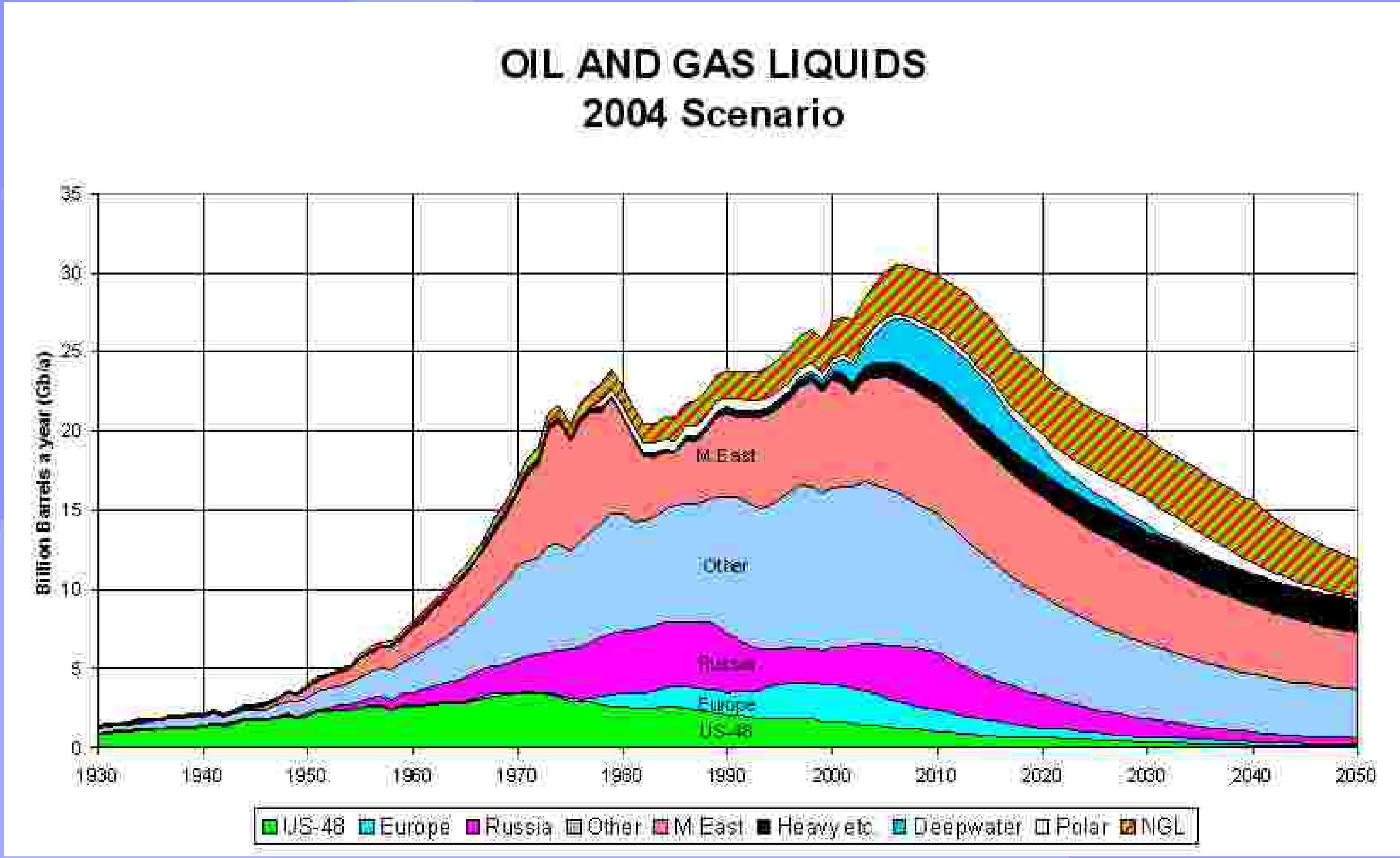
UK Energy Trends



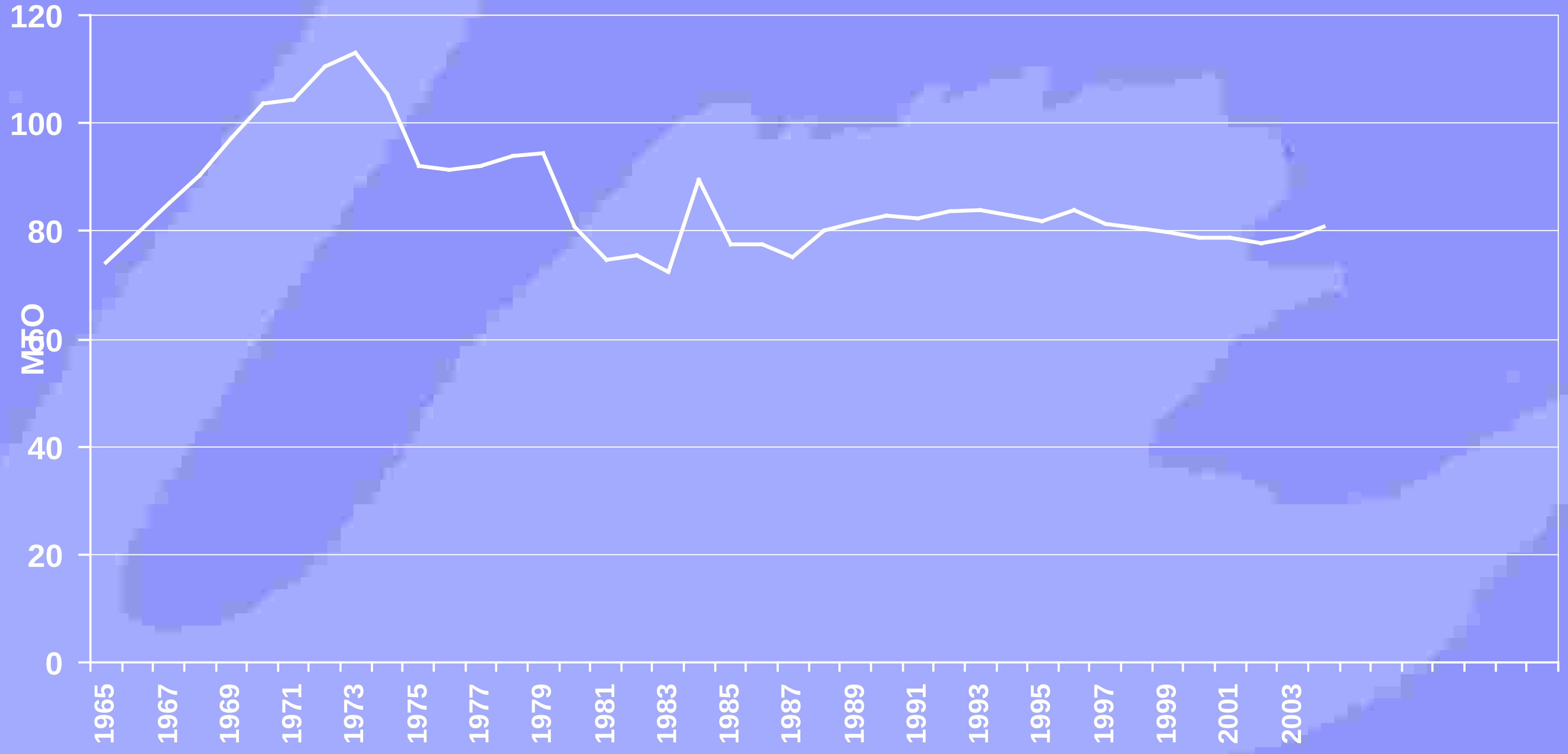
Global Oil Production



Global Oil Production



Oil Demand



MTO
120
100
80
60
40
20
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1965
1967
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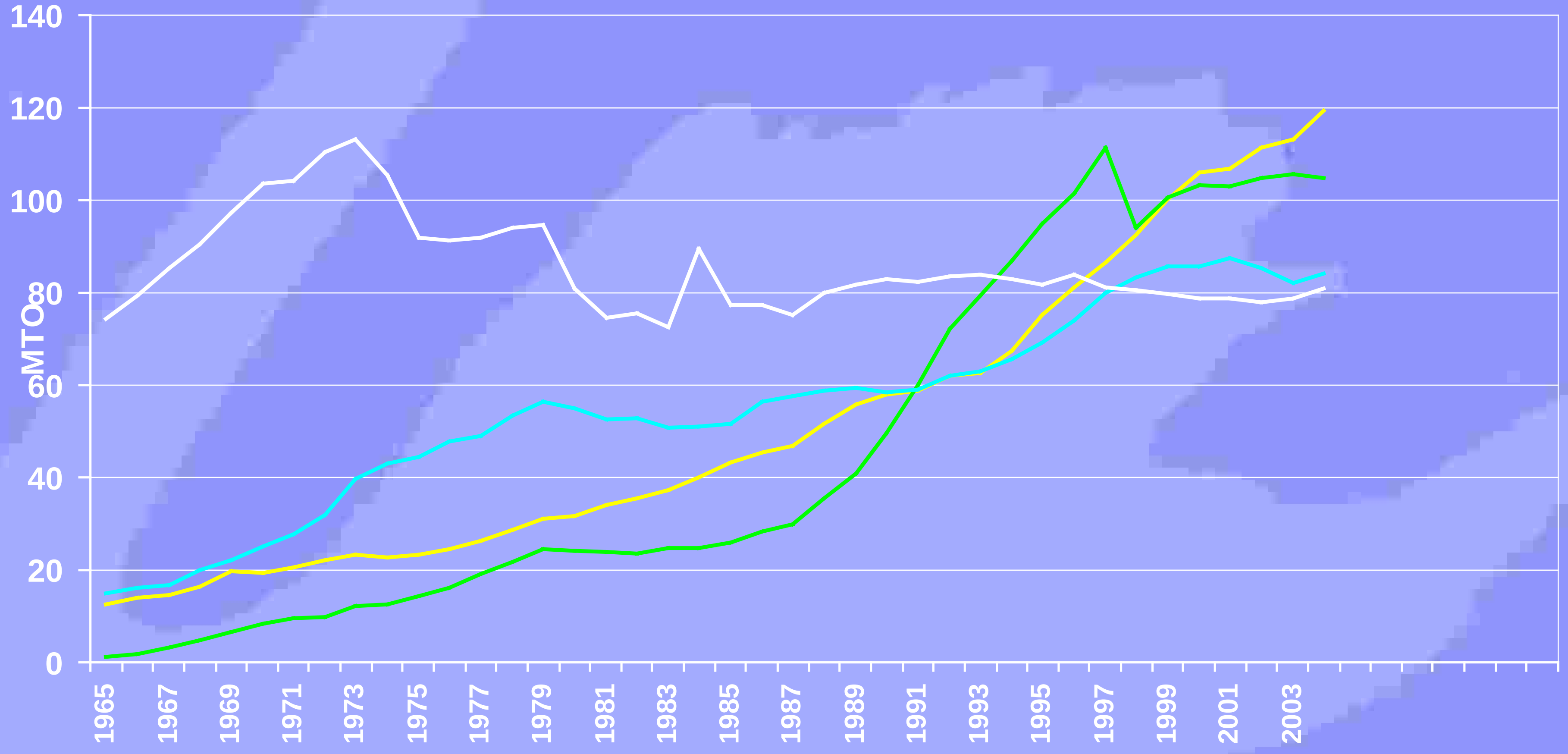
Oil Demand



MTOe
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1965
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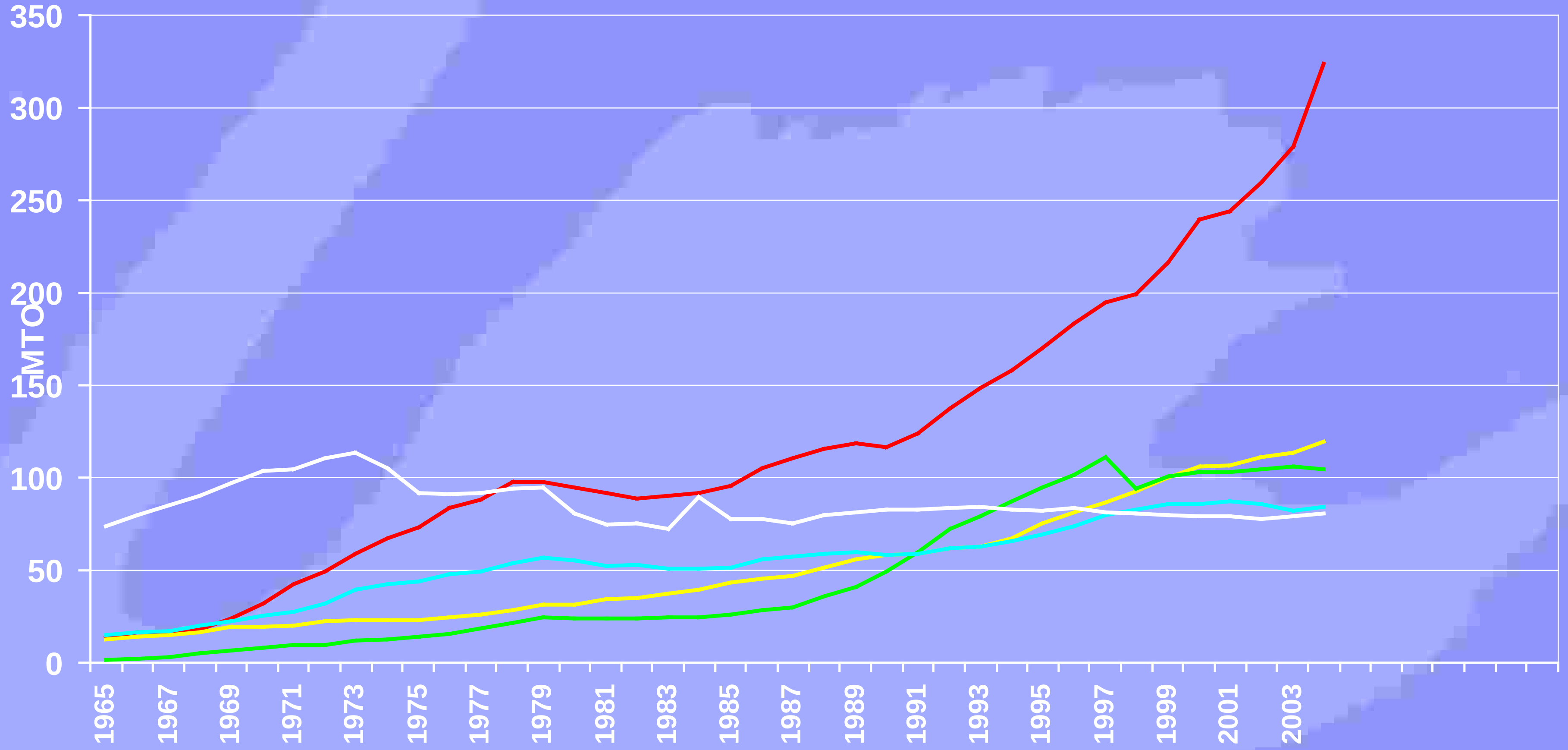
Oil Demand



350
300
250
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MTOE
1965
1967
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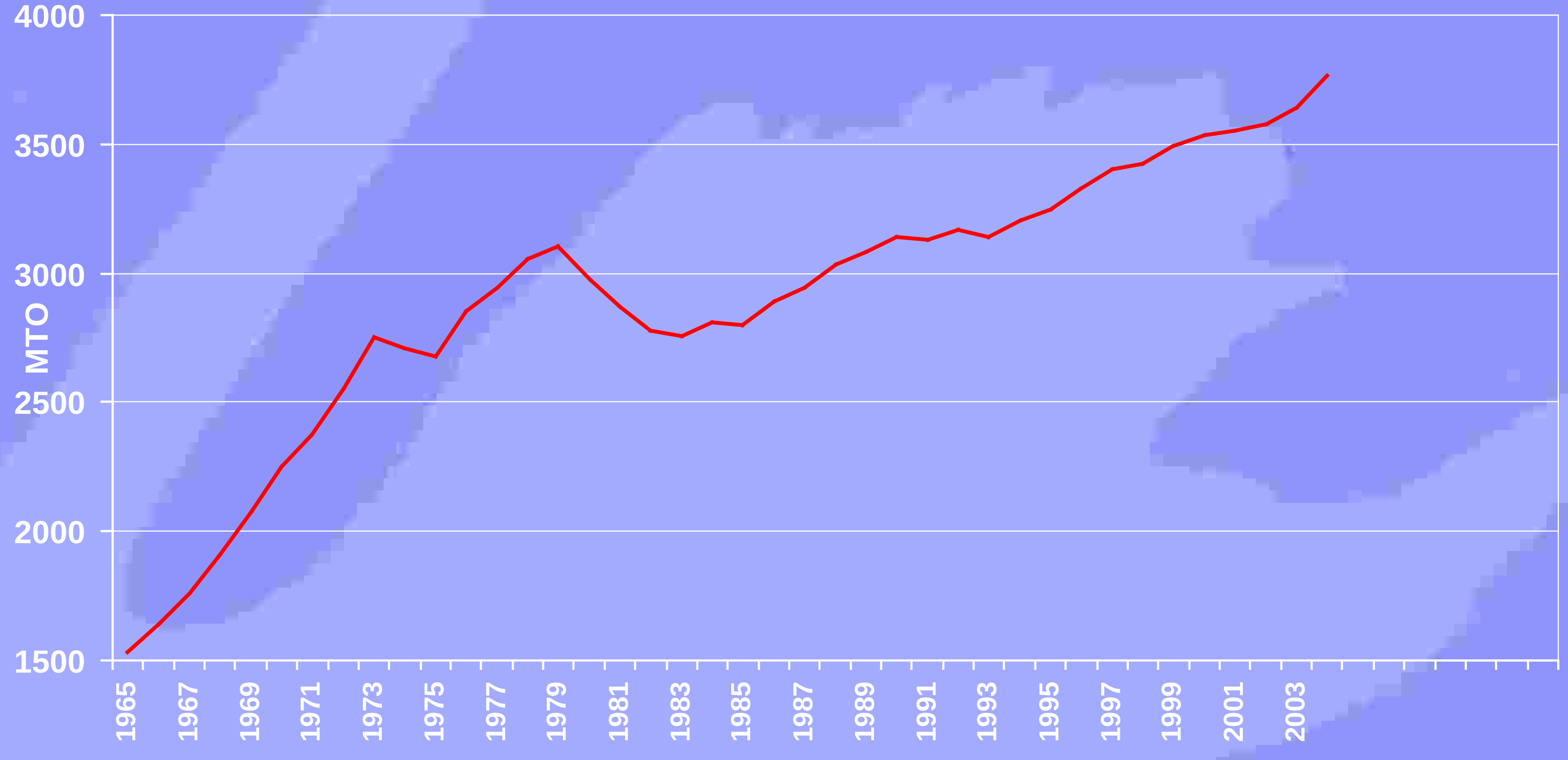
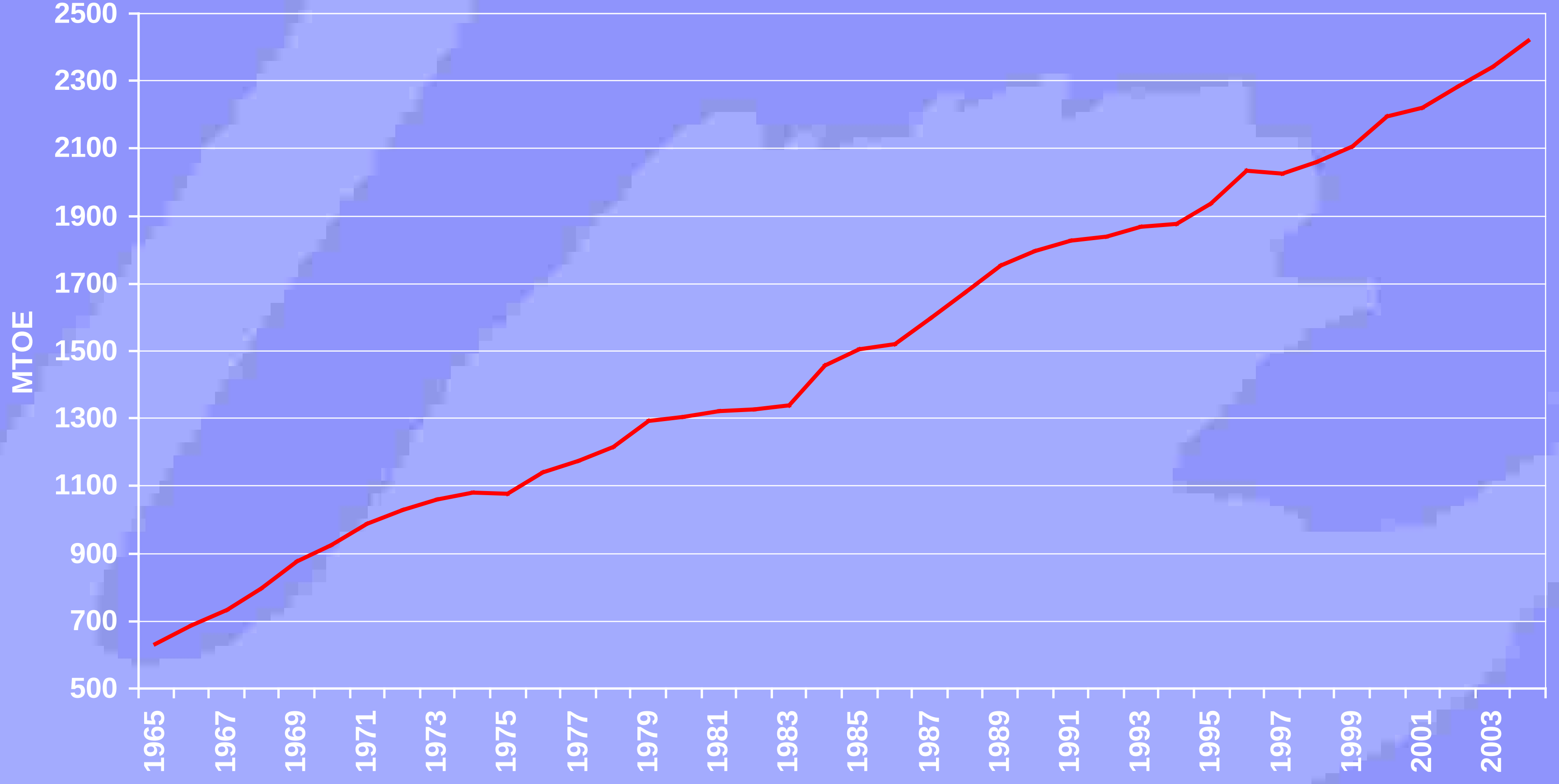
Global Oil Demand



Global Gas Demand



What are they Saying?

- "I wish I could simply wave a magic wand and lower gas prices tomorrow. But we must act now to address the fundamental problem. Our supply of energy is not growing fast enough to meet the demands of our growing economy.....
  - George W Bush – 20 April 2005

What are they Saying?

- "[Australia's] Deputy Prime Minister John Anderson believes high fuel prices reflect the inevitable decline in the world's oil and gas reserves.
  - – Australia Broadcasting Corporation – 20 May 2005

What are they Saying?

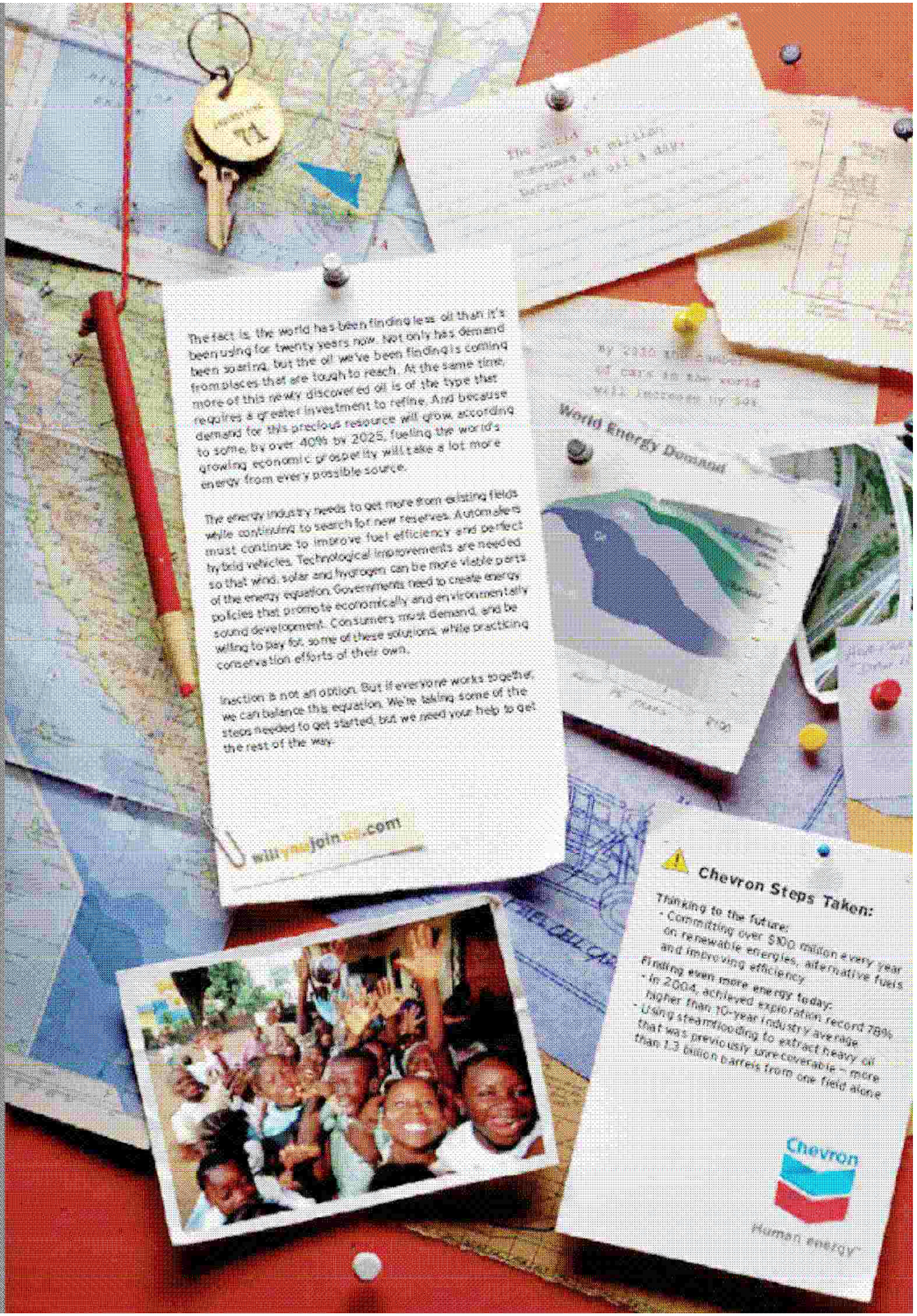
- 'The world faces enormous energy challenges. There are no easy answers.' ....
  - Exxon Mobil – 2005

What are they Saying?

- 'One thing is clear: The era of easy oil is over. We call upon scientists and educators, politicians and policy-makers, environmentalists, leaders of industry and each one of you to be part of reshaping the next era of energy. Inaction is not an option,'
  - Chevron Corporation – 2005

The world consumes two barrels of oil for every barrel discovered.

So is this something you should be worried about?



Lord Browne of BP

- **2004 was a year of rising energy prices and growing concern in many parts of the world about the security of future supplies**
  - June 2005

Global Energy Supply Outlook

- Oil production will now peak in 2007
  - Oil demand is still accelerating
  - Demand may overtake production earlier
- Gas production will peak in 2020
  - Gas demand is accelerating
- Coal production will peak in 2040

And then came Dennis

Much, much worse

Shell Mars Platform

Shell Mars Platform

Hurricane Katrina

- 58 Platforms damaged
- 26 platforms & rigs missing
    - 15 of these were hub platforms
- Oilfield port of Venice – destroyed
- 8 refineries shut down
- On-shore gas compression plants inoperable
- Pipelines not yet inspected

Hurricane Katrina

- Oil production now below demand
  - Have we reached a turning point?
- Gas supplies in US now inadequate
  - Enhanced demand for LNG
- World wide energy crisis
  - Says the IEA

What are they Saying?

- We have entered the post oil era.
  - Dominique de Villepin - 1/9/2005
- ..the big increase in (the oil) price over the last year will remain.
  - Mervyn King – 1/9/2005

General Situation - Oil

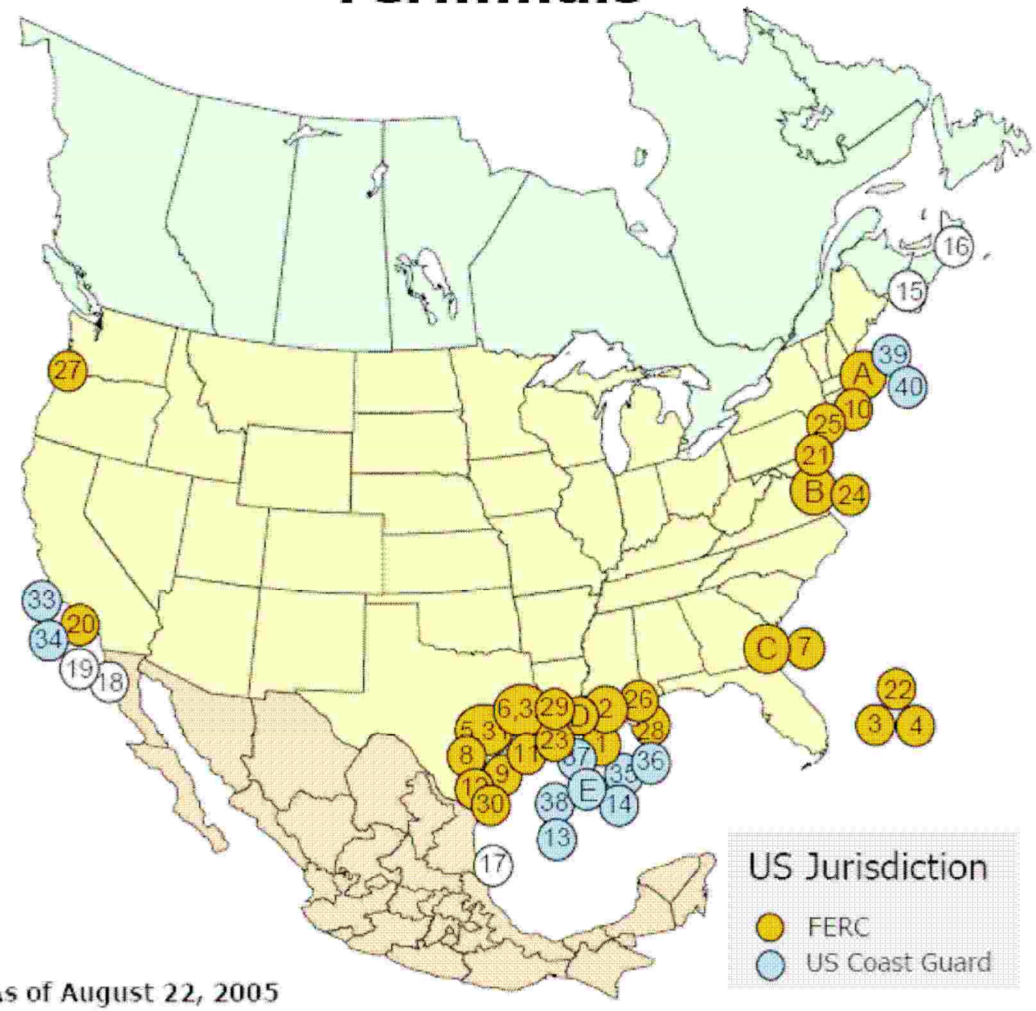
- Global oil demand exceeds supply
- Oil prices will continue to rise
- Military adventures to secure oil supplies more likely
- Threat of terrorist action against oil installations is enhanced
- Agricultural output will fall

General Situation - Gas

- US reliant on imports before Katrina
- Gas prices in US now around $12/mmBtu
- LNG infrastructure being built now

FERC

Existing and Proposed North American LNG Terminals



As of August 22, 2005

* *US pipeline approved; LNG terminal pending in Bahamas*

CONSTRUCTED
A. **Everett, MA :** 1.035 Bcfd (Tractebel - DOMAC)
B. **Cove Point, MD :** 1.0 Bcfd (Dominion - Cove Point LNG)
C. **Elba Island, GA :** 0.68 Bcfd (El Paso - Southern LNG)
D. **Lake Charles, LA :** 1.0 Bcfd (Southern Union - Trunkline LNG)
E. **Gulf of Mexico:** 0.5 Bcfd, (Gulf Gateway Energy Bridge - Excelerate Energy)

APPROVED BY FERC
1. **Lake Charles, LA:** 1.1 Bcfd (Southern Union - Trunkline LNG)
2. **Hackberry, LA :** 1.5 Bcfd, (Sempra Energy)
3. **Bahamas :** 0.84 Bcfd, (AES Ocean Express)*
4. **Bahamas :** 0.83 Bcfd, (Calypso Tractebel)*
5. **Freeport, TX :** 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)
6. **Sabine, LA :** 2.6 Bcfd (Cheniere LNG)
7. **Elba Island, GA:** 0.54 Bcfd (El Paso - Southern LNG)
8. **Corpus Christi, TX:** 2.6 Bcfd, (Cheniere LNG)
9. **Corpus Christi, TX :** 1.0 Bcfd (Vista Del Sol - ExxonMobil)
10. **Fall River, MA :** 0.8 Bcfd, (Weaver's Cove Energy/Hess LNG)
11. **Sabine, TX :** 1.0 Bcfd (Golden Pass - ExxonMobil)
12. **Corpus Christi, TX:** 1.0 Bcfd (Ingleside Energy - Occidental Energy Ventures)

APPROVED BY MARAD/COAST GUARD
13. **Port Pelican:** 1.6 Bcfd, (Chevron Texaco)
14. **Louisiana Offshore :** 1.0 Bcfd (Gulf Landing - Shell)

CANADIAN APPROVED TERMINALS
15. **St. John, NB :** 1.0 Bcfd, (Canaport - Irving Oil)
16. **Point Tupper, NS** 1.0 Bcf/d (Bear Head LNG - Anadarko)

MEXICAN APPROVED TERMINALS
17. **Altamira, Tamulipas :** 0.7 Bcfd, (Shell/Total/Mitsui)
18. **Baja California, MX :** 1.0 Bcfd, (Sempra)
19. **Baja California - Offshore :** 1.4 Bcfd, (Chevron Texaco)

PROPOSED TO FERC
20. **Long Beach, CA :** 0.7 Bcfd, (Mitsubishi/ConocoPhillips - Sound Energy Solutions
21. **Logan Township, NJ :** 1.2 Bcfd (Crown Landing LNG - BP)
22. **Bahamas :** 0.5 Bcfd, (Seafarer - El Paso/FPL)
23. **Port Arthur, TX:** 1.5 Bcfd (Sempra)
24. **Cove Point, MD :** 0.8 Bcfd (Dominion)
25. **LI Sound, NY:** 1.0 Bcfd (Broadwater Energy - TransCanada/Shell)
26. **Pascagoula, MS:** 1.0 Bcfd (Gulf LNG Energy LLC)
27. **Bradwood, OR:** 1.0 Bcfd (Northern Star LNG - Northern Star Natural Gas LLC)
28. **Pascagoula, MS:** 1.3 Bcfd (Casotte Landing - ChevronTexaco)
29. **Cameron, LA:** 3.3 Bcfd (Creole Trail LNG - Cheniere LNG)
30. **Port Lavaca, TX:** 1.0 Bcfd (Calhoun LNG - Gulf Coast LNG Partners)
31. **Freeport, TX:** 2.5 Bcfd (Cheniere/Freeport LNG Dev. - Expansion)
32. **Sabine, LA:** 1.4 Bcfd (Cheniere LNG - Expansion)

PROPOSED TO MARAD/COAST GUARD
33. **California Offshore:** 1.5 Bcfd (Cabrillo Port - BHP Billiton)
34. **So. California Offshore :** 0.5 Bcfd, (Crystal Energy)
35. **Louisiana Offshore :** 1.0 Bcfd (Main Pass McMoRan Exp.)
36. **Gulf of Mexico:** 1.0 Bcfd (Compass Port - ConocoPhillips)
37. **Gulf of Mexico:** 2.8 Bcfd (Pearl Crossing - ExxonMobil)
38. **Gulf of Mexico:** 1.5 Bcfd (Beacon Port Clean Energy Terminal - ConocoPhillips)
39. **Offshore Boston, MA:** 0.4 Bcfd (Neptune LNG - Tractebel)
40. **Offshore Boston, MA:** 0.8 Bcfd (Northeast Gateway - Excelerate Energy)

Office of Energy Projects

General Situation - Gas

- US reliant on imports before Katrina
- Gas prices in US now around $12/mmBtu
- LNG infrastructure being built now
- Reserves are concentrated in middle east and Russia
- Demand is concentrated in North America and Europe

Gas

- We are assured of a rosy future - gas will be imported
  - from Russia by pipeline and
  - from elsewhere as LNG
- A pipeline from Russia is long and crosses many other countries
- Russia views Gazprom as a legitimate instrument of foreign policy

Gas - LNG

- Total global LNG trade in 2003 was 168 bcm
- In 2004 this increased to 178 bcm
- US demand will be over 600 bcm by 2015
- Russian gas will go to Europe, China and Eur-Asia
- Asia-Pacific gas will go to Japan and Pacific rim
- Other LNG will come from the middle east
- Gas prices reflect general situation

Immediate Implications for UK

- Oil & gas prices will remain high
- Electricity prices will remain high
- Oil supplies may become restricted
- Real threat to gas supplies this winter

Conclusions

- Prices will continue to rise
- Supply will be restricted
- Conflict is more likely
- The party is over

Sir Fred Hoyle

- We have, or soon will have, exhausted the necessary physical prerequisites so far as this planet is concerned. With coal gone, oil gone, high-grade metallic ores gone, no species however competent can make the long climb from primitive conditions to high-level technology. This is a one-shot affair. If we fail, this planetary system fails so far as intelligence is concerned.

Conclusions

- **Prices will continue to rise**
- **Supply will be restricted**
- **Conflict is more likely**
- **The party is over**
- **The Limits to Growth**

‘Facts do not cease to exist because they are ignored.’

Aldous Huxley

What next?

Any questions?