

Why Natural Gas Is Not An Alternative!

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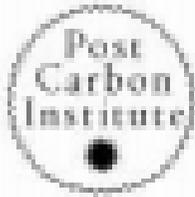
Systemic Problems

- Energy affects everything
- Without energy there is no life and no movement
- But we have much more than just energy problems
- We have a systems problem
- The system is broken
- Will humans plan the change?
- Or will it be left to Nature?



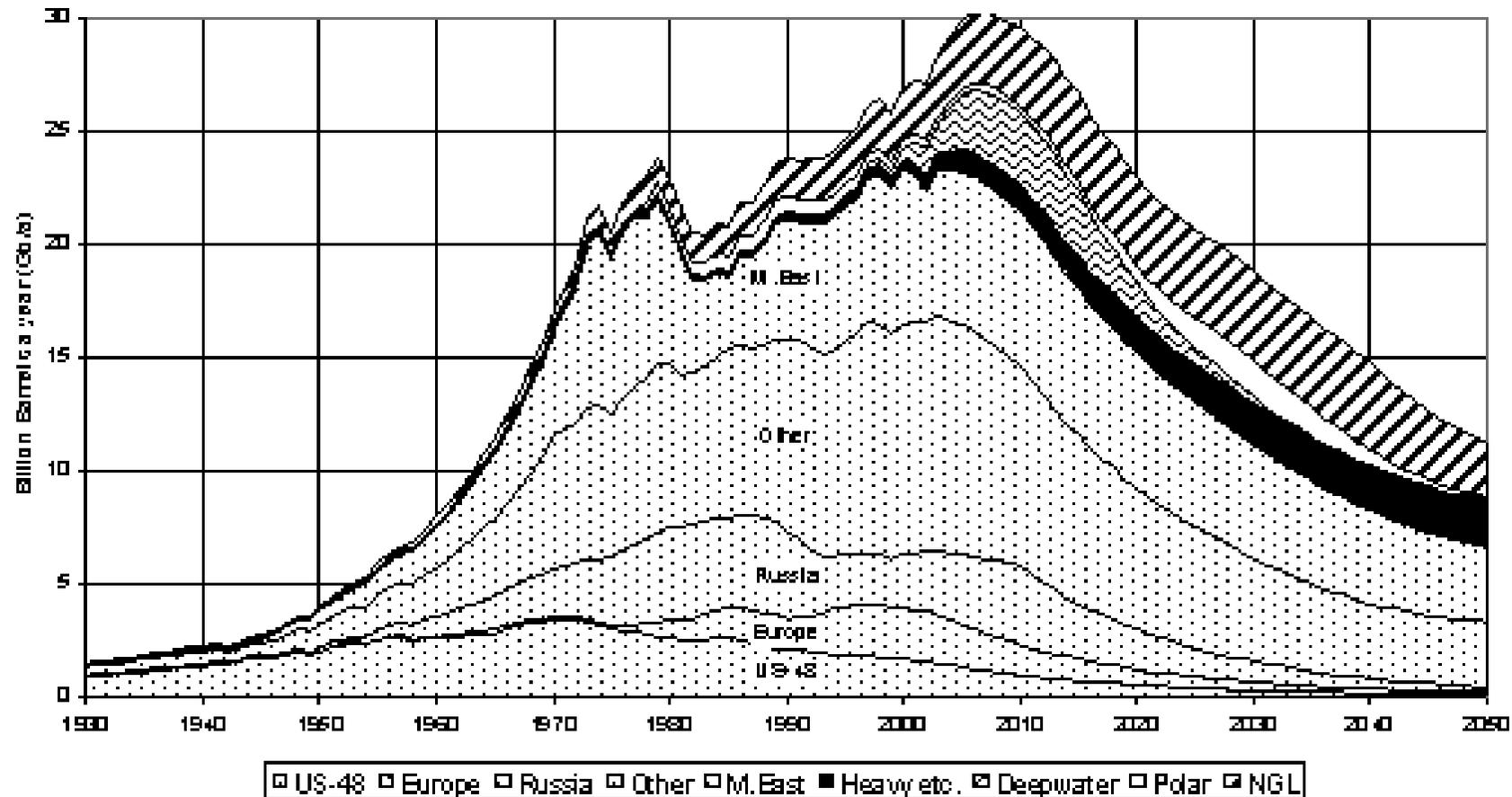
Why are we turning to natural gas?

- Climate change
 - gas is cleaner than oil or coal
- World oil peak & depletion
 - natural gas can substitute for oil

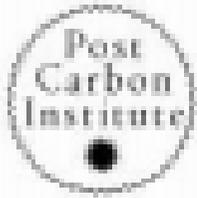


ASPO Depletion Model 2004

OIL AND GAS LIQUIDS
2004 Scenario

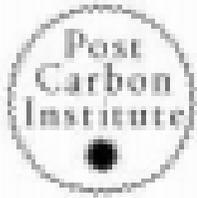


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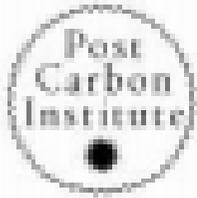
Why are we turning to natural gas?

- Climate change
 - gas is cleaner than oil or coal
- World oil situation
 - obvious substitute for oil
- Gas is versatile
 - electricity (base load & peaking)
 - heating (space & process)
 - nitrogen fertiliser
 - chemical feedstock (eg plastics, methanol)
 - vehicle fuel



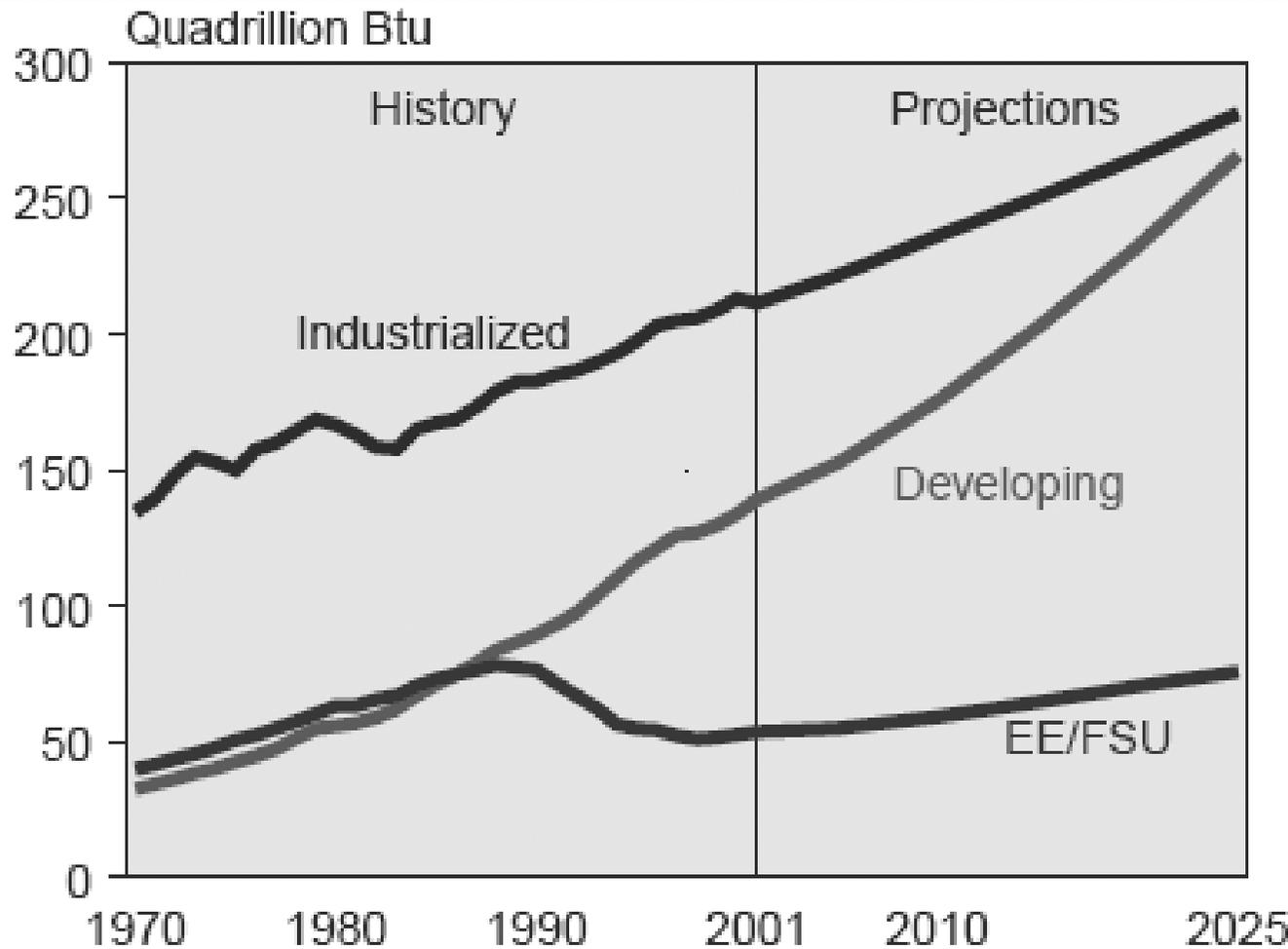
Gas dependence

- US already using over 22 Tcf per year
- World using over 90 Tcf per year
- Europe also highly dependent on gas
 - UK in particular
 - consuming ~3.5 Tcf per year
- Strong link between economic growth and electricity use
 - 3% economic growth requires 2.3% electricity growth
- Industrialised world produces 20% electricity from natural gas

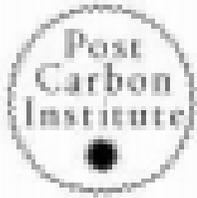


Energy Forecasts (1)

World Marketed Energy Consumption by Region, 1970-2025

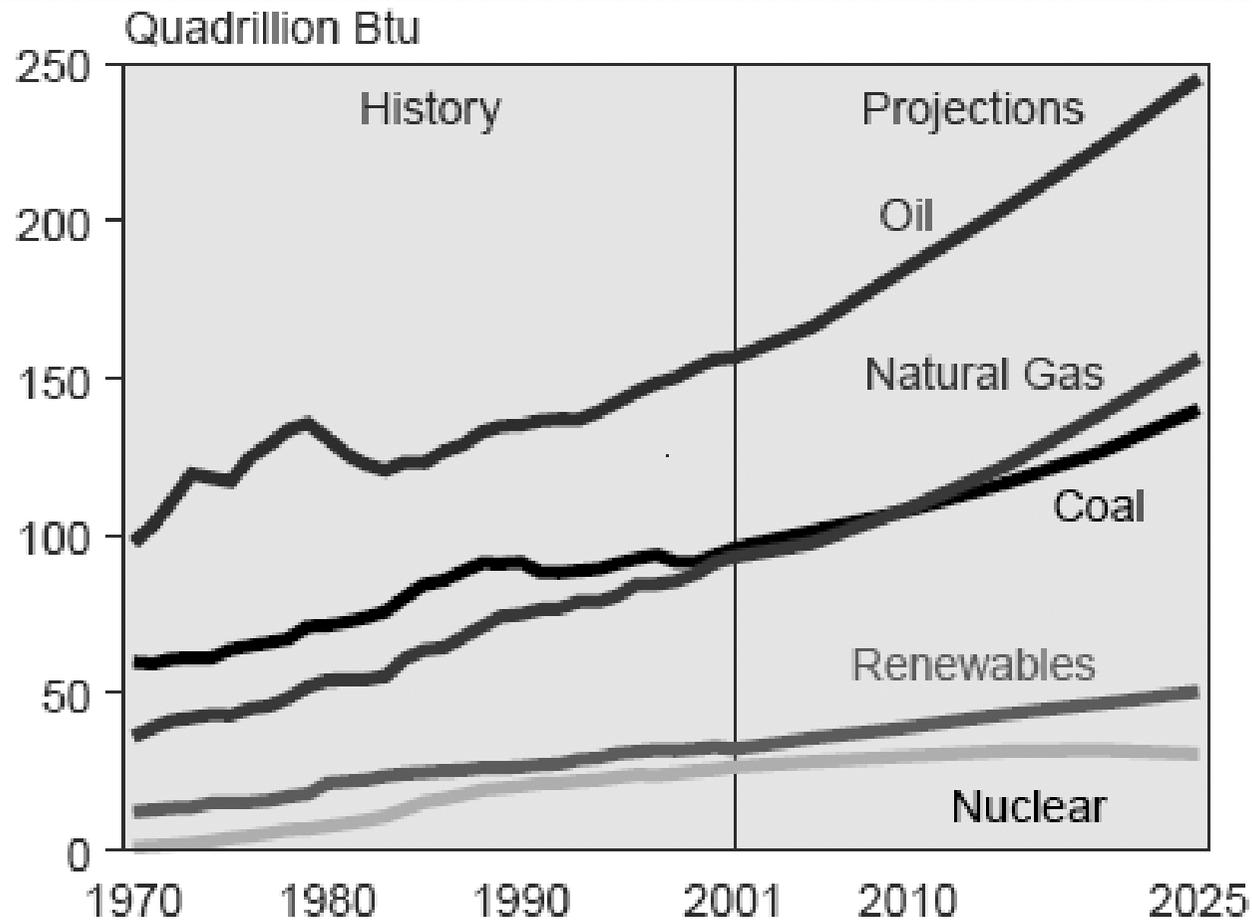


US Energy Information Administration

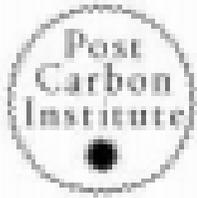


Energy Forecasts (2)

World Energy Consumption by Energy Source, 1970-2025



US Energy Information Administration



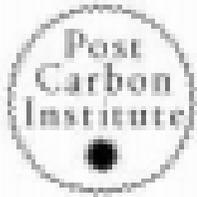
Energy Forecasts (3)

- Worldwide energy consumption from 2001 to 2025 (assuming 3% economic growth per year)
- overall energy: 54% growth
- oil: 57% (from 77 mb/d to 121 mb/d)
- natural gas: 67% (from 90 Tcf/a to 151 Tcf/a)
- electricity: 74% (13 290 bn kWh to 23 072)
- in the industrialised world
 - proportion of gas-fired electricity - set to grow from 20% to 30%

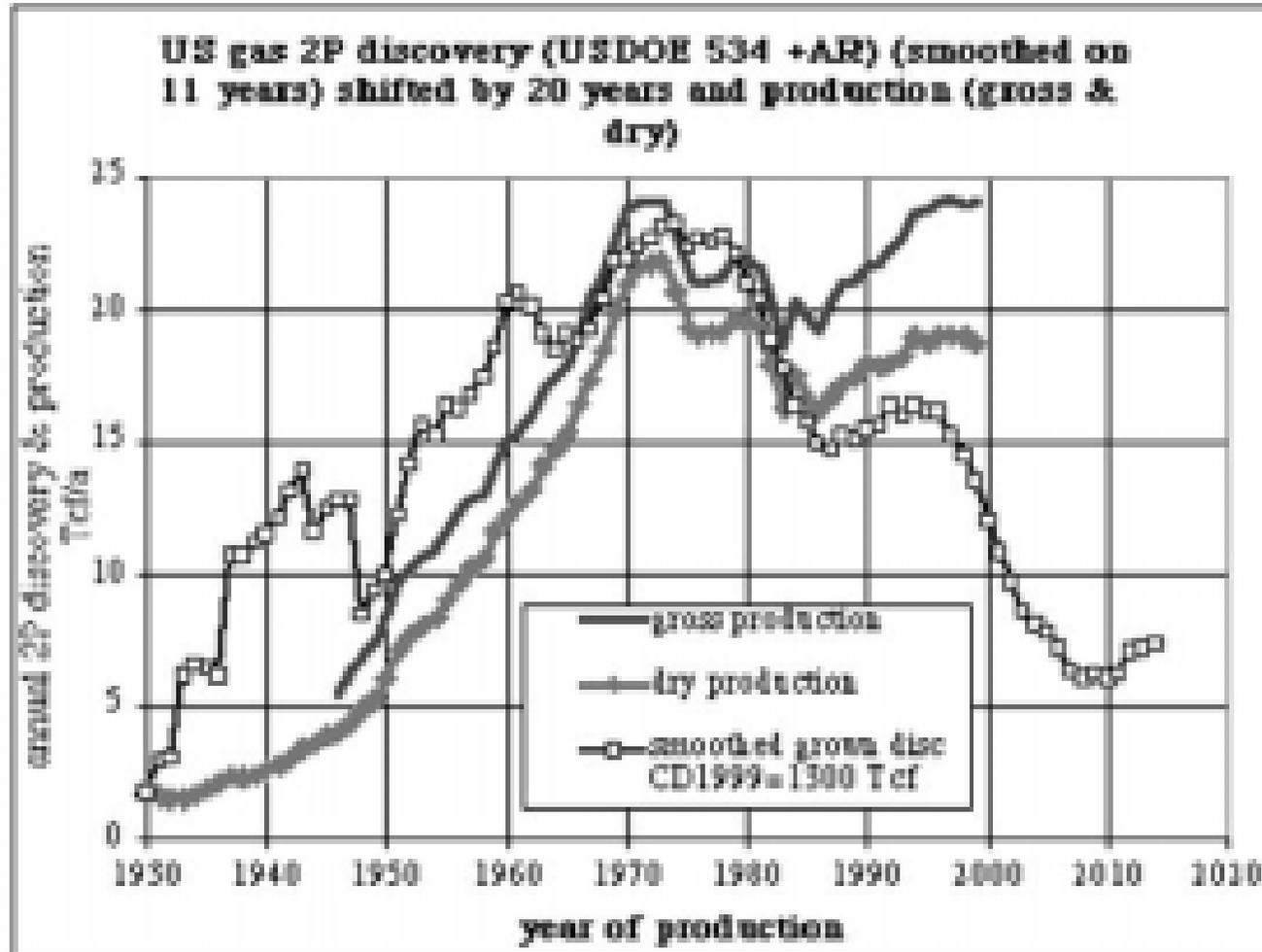


Supply

- Gas extraction in most of the world's industrial nations is in decline



US Gas Discovery & Extraction



Jean Laherrere
Energy Exploration & Exploitation
Vol 20 2002, Numbers 2 & 3



Canada Natural Gas: Discovery & Extraction



Jean Laherrere
Energy Exploration & Exploitation
Vol 20 2002, Numbers 2 & 3



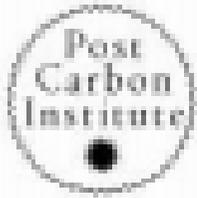
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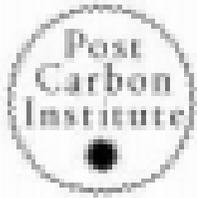
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- Gas is hard to transport, this means either (or both)
 - expensive pipelines
 - even more expensive LNG (Liquefied Natural Gas)



LNG in Western Europe



US Energy Information Administration

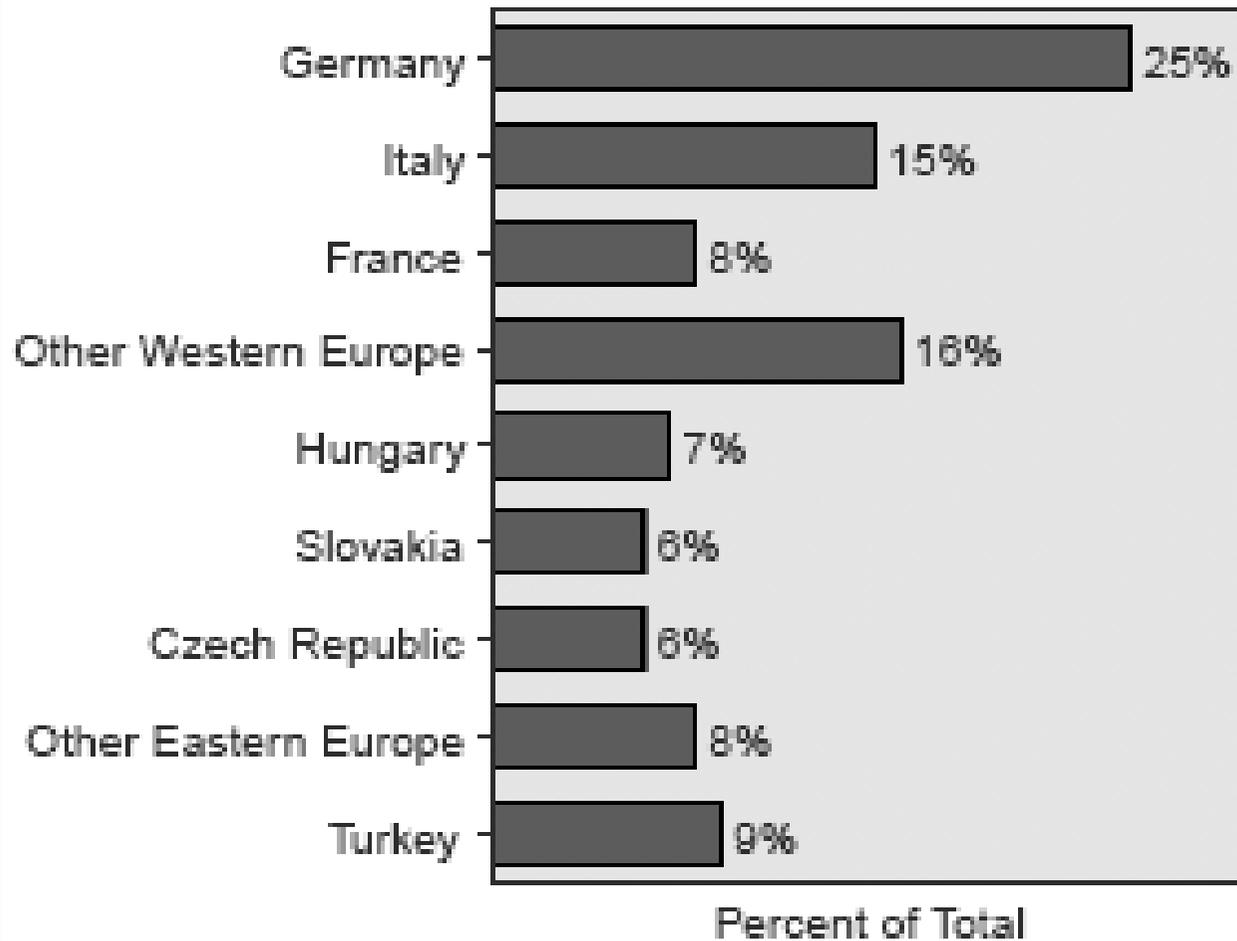


Supply

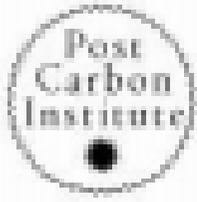
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- Gas is hard to transport, this means either (or both)
 - expensive pipelines
 - even more expensive LNG (Liquefied Natural Gas)
- More nations becoming more dependent on fewer producing nations



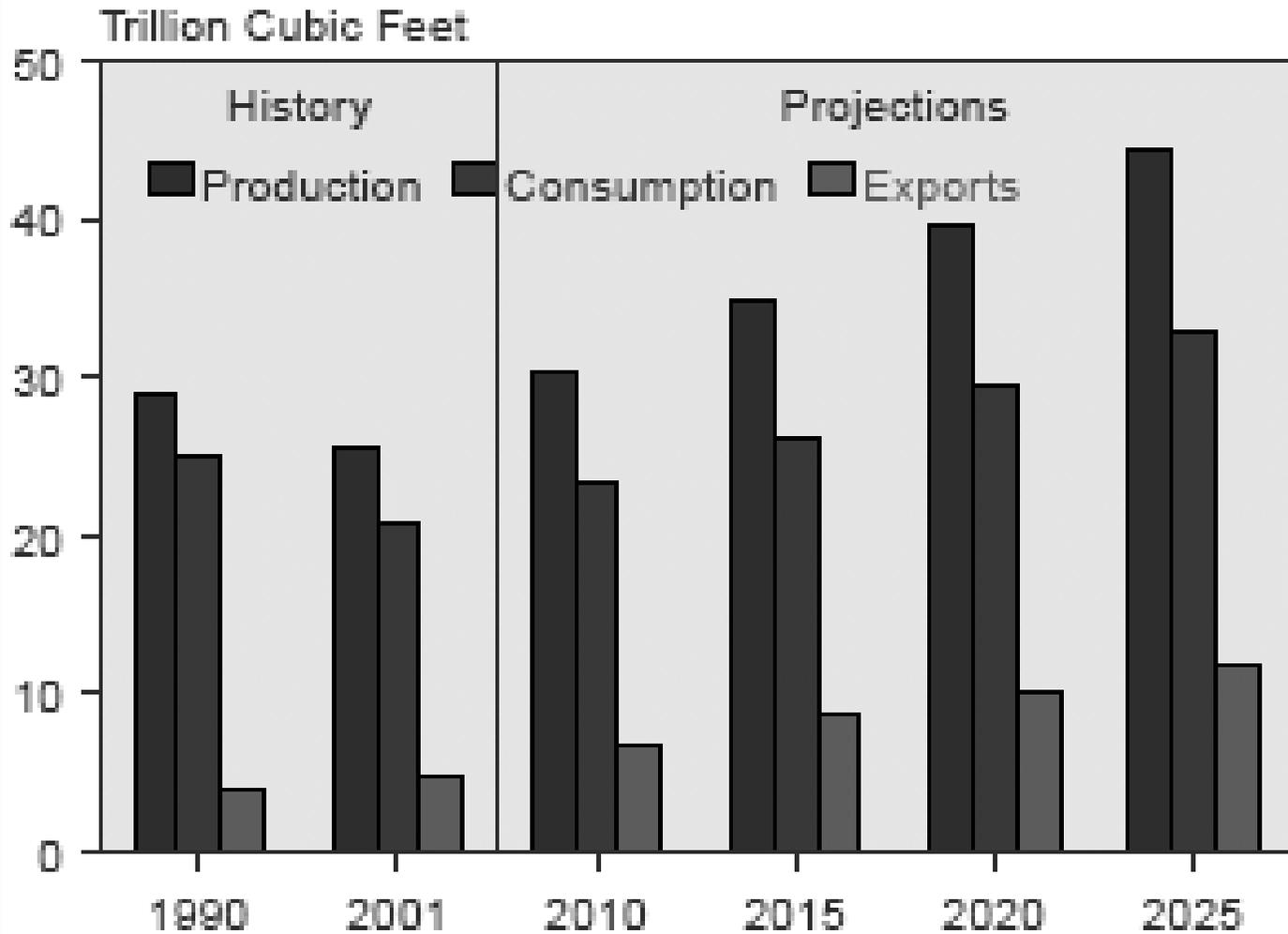
Russian Natural Gas Exports by Destination, 2002



US Energy Information Administration



Natural Gas Production, Consumption, and Exports in the FSU Region, 1990-2025



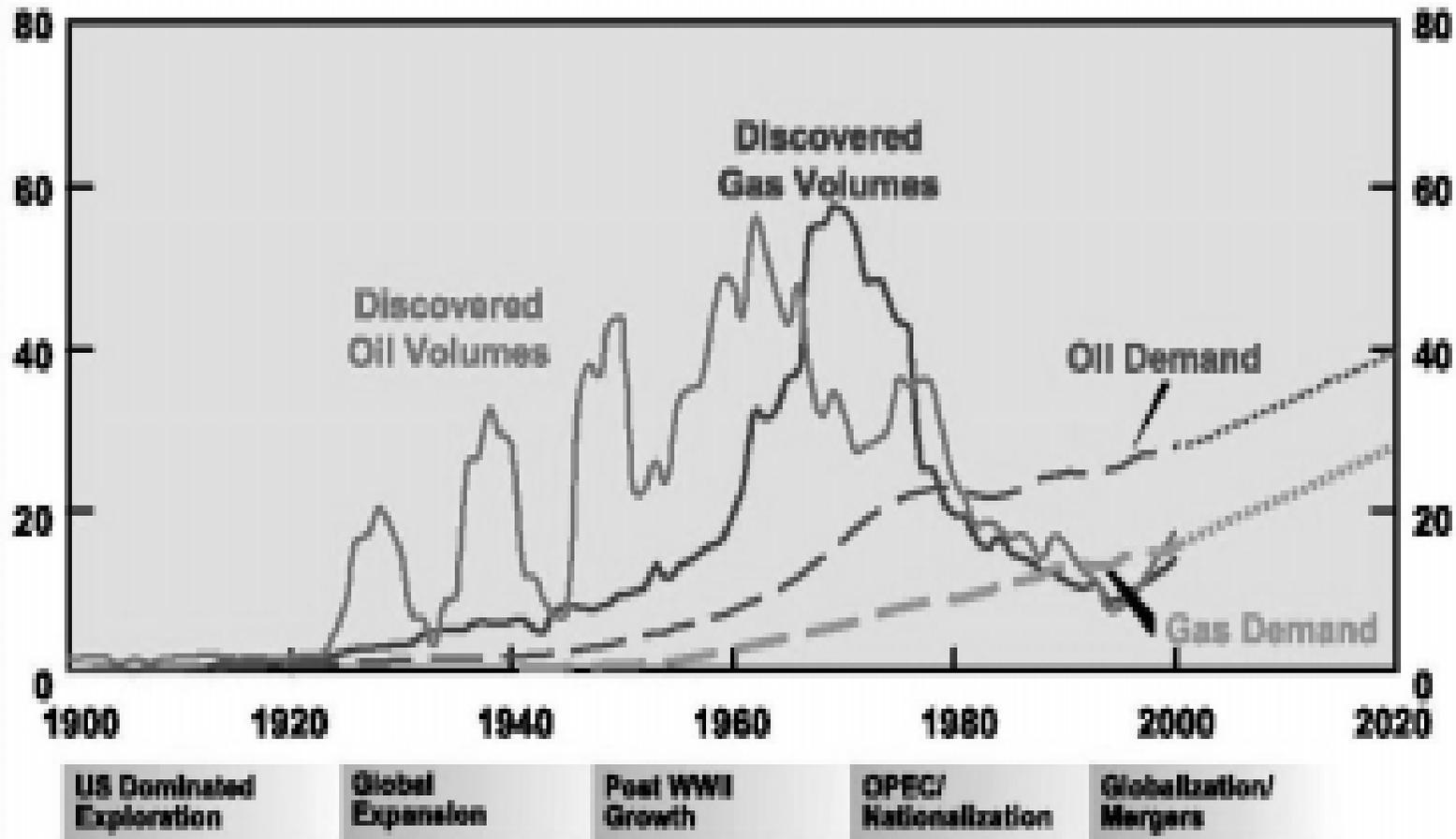
US Energy Information Administration



World Oil & Gas

Discovery & Extraction (ExxonMobil)

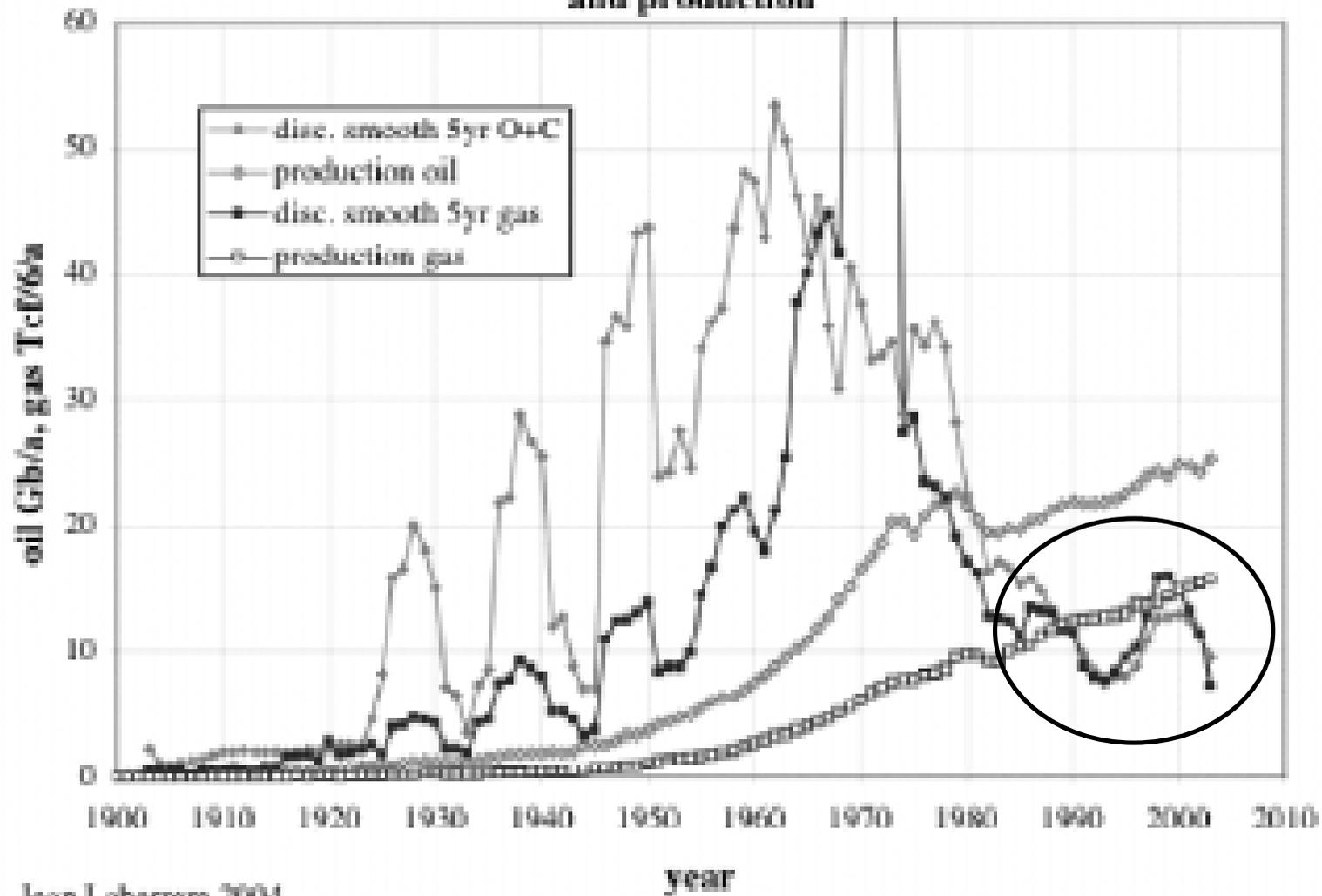
Billions of Oil-Equivalent Barrels





Oil & Gas Discovery: Endgame

World conventional oil & gas annual mean discovery and production

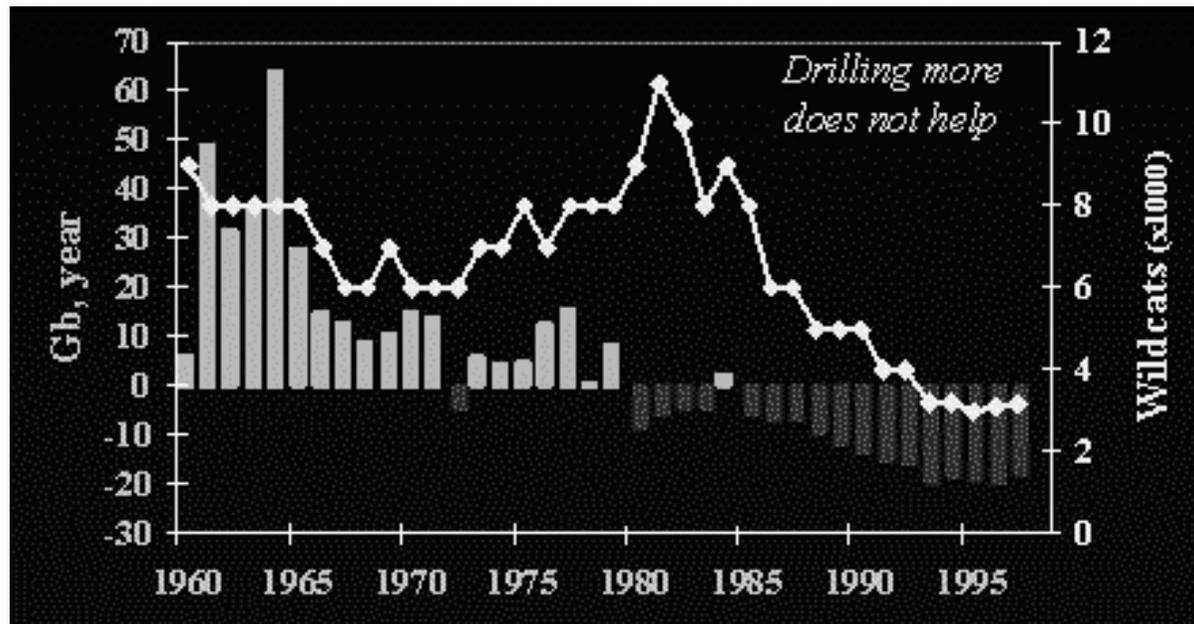


Jean Laherrere 2004



Supply Problems (1)

- 2001 & 2002 – first time that more gas used than found
- Remember oil:



Colin Campbell



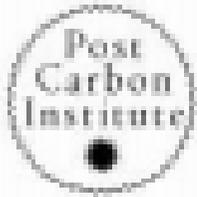
Supply Problems (2)

- As much as 65% of world gas producers are in decline
 - some permanently, some maybe only temporary
- Doubts being raised about reserve estimates of largest gas nations
 - Russia
 - Iran
 - Qatar



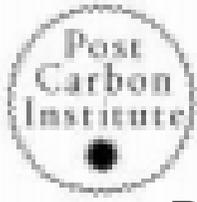
No Magic Bullets

- Canadian tar sands
 - require a lot of gas (~1 Bcf per million barrels synthetic crude)
- Unconventional gas:
 - Coal Bed Methane (CBM)
 - Abiotic gas
 - Methane hydrates



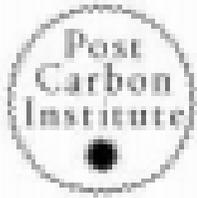
Conclusions (gas)

- Natural gas is 'cleaner' than any other hydrocarbon, but when burnt, it still produces CO₂
 - many signs that global warming is accelerating
 - methane is a significant greenhouse gas (if vented or escapes)
- Natural gas use is supposed to grow enormously AND now will need to replace oil much faster than previously thought
 - but is there enough supply – geological & infrastructure?
- Bad example to follow: US built 220 000 megawatts of new gas-fired electrical power stations
 - then discovered there wasn't enough gas
- Large percentage of the \$16 trillion IEA estimate for energy infrastructure is for electricity and natural gas
 - is this wise – or a waste of money?
- Increasing natural gas use
 - will exacerbate carbon battles
 - a century of oil wars
 - now gas wars too?
 - will NOT bring energy security or independence
- Last warning that we must get off big energy
 - move to renewable, decentralised energy



Conclusions (general)

- Renewable energy is clearly
 - abundant and a common pool resource
 - the only sane way of harvesting exogenous energy
 - capable of sustaining a human population
 - but not 6 billion people nor heavily industrialised societies
- Furthermore substituting one sort of energy for another while we increase economic and population growth will carry us ever deeper into overshoot and biosphere destruction
 - biomass depends soil – which we are ruining and eroding
 - increasing evidence that Earth cannot support more than a billion humans without oil and gas for food production
 - we must take care of our soil – no petrochemical inputs whatsoever
- The Military Industrial Market Capitalist system is broken
 - endless violence, endless extraction, unfair allocation, uncontrollable greed
 - built on coal, oil, and gas, and a debt-based, interest-bearing money system
 - designed and developed by the rich, for the rich - globally undemocratic
 - essentially a piratical, parasitic, pyramid system of empire and endless growth
- We are reaching the limits to growth - there are dozens of other warnings besides gas and oil
- We must plan to reduce demand fast – most likely by a factor of at least ten
 - by emergency economic contraction and other measures
 - **before Nature does it for us**
 - We need relocalisation - a soil and solar system – simple technology



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For interviews about oil & gas peak
www.GlobalPublicMedia.com



High Noon for Natural Gas
The Next Energy Crisis
by Julian Darley
(July 2004, Chelsea Green Publishing)

The Carbon Chasm:
Post Carbon Reports 2003