

# zerocarbonbritain

an alternative energy strategy

**By Paul Allen, CAT, UK**

INFORSE-Europe and EREF

European Sustainable Energy Policy Seminar,

April 8, 2008, Brussels

[http://www.inforse.org/europe/seminar08\\_BXL.htm](http://www.inforse.org/europe/seminar08_BXL.htm)



Centre for  
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Project Partners



**intro**duction 

global**context** 

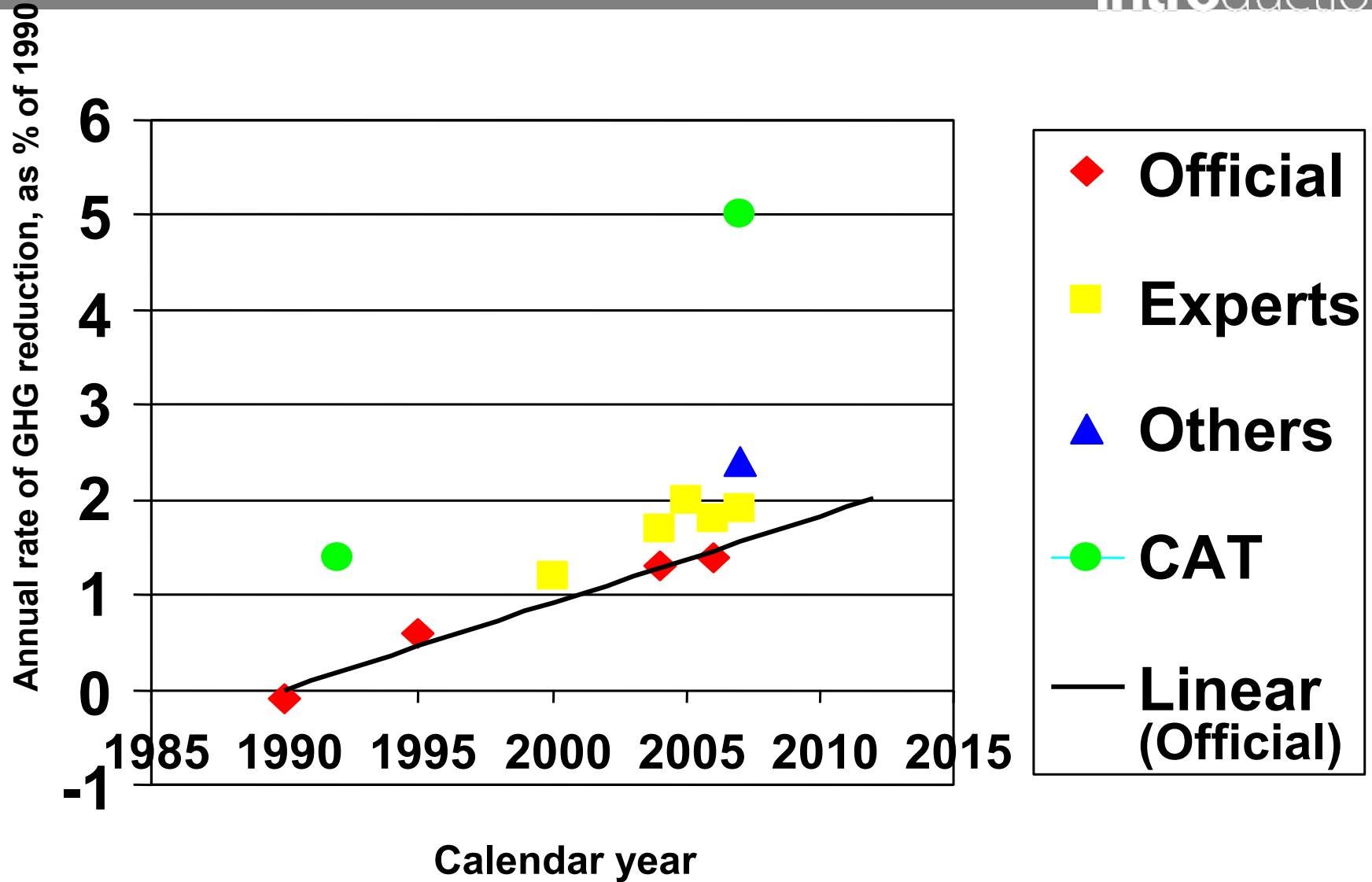
frame**work** 

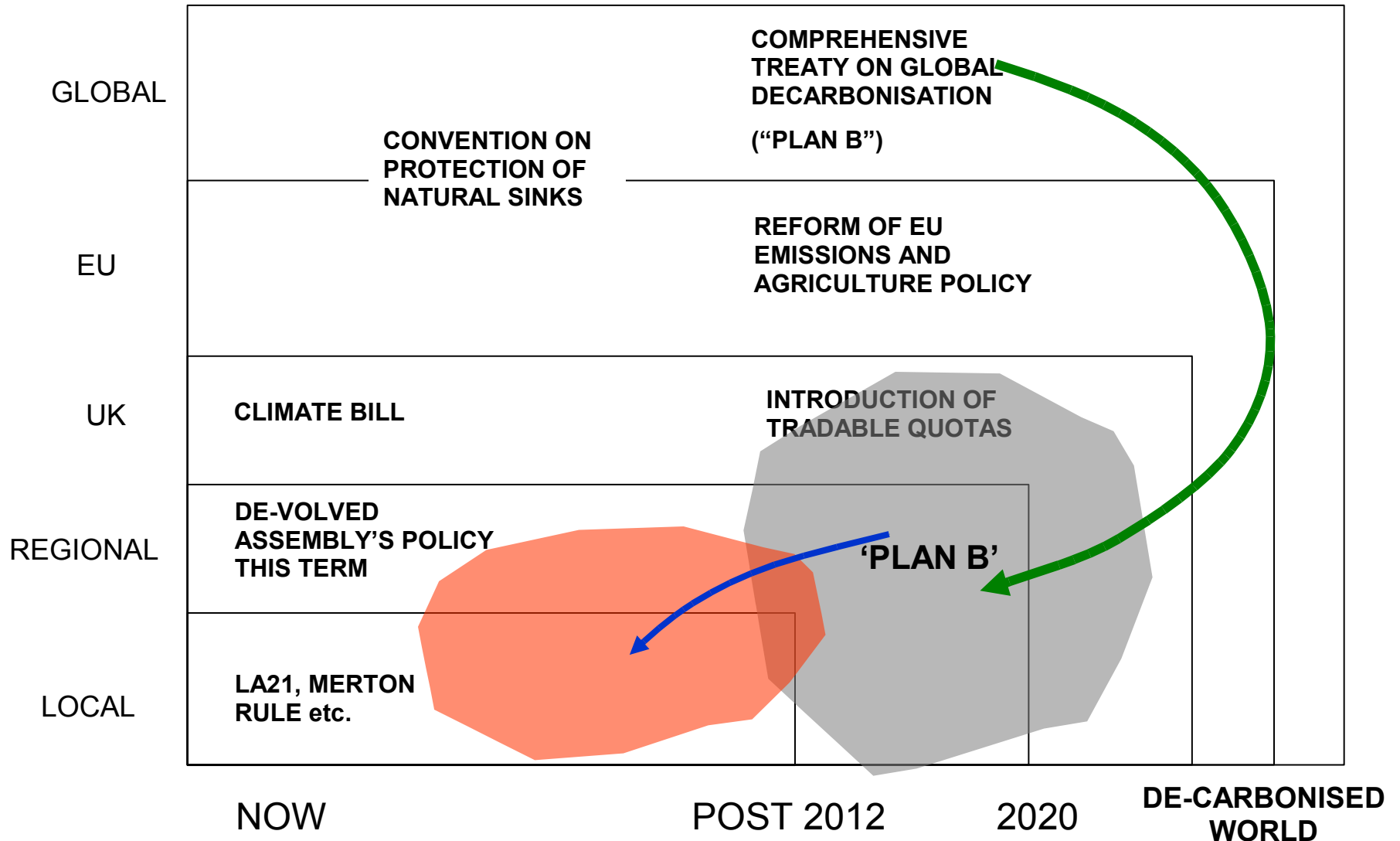
power**down** 

power**up** 

# introduction

- 1977 Alternative Energy Strategy for the UK
- Predictions & evidence over 30 years
- Integrated solution to the 3 key challenges
- Launched June 2007 at APPCCG





# Charting the new terrain

- Identifying areas for urgent research
- Create a common, coherent vision
- Endorsing, supporting and connecting actions from all sectors of European society



Reading of the science:

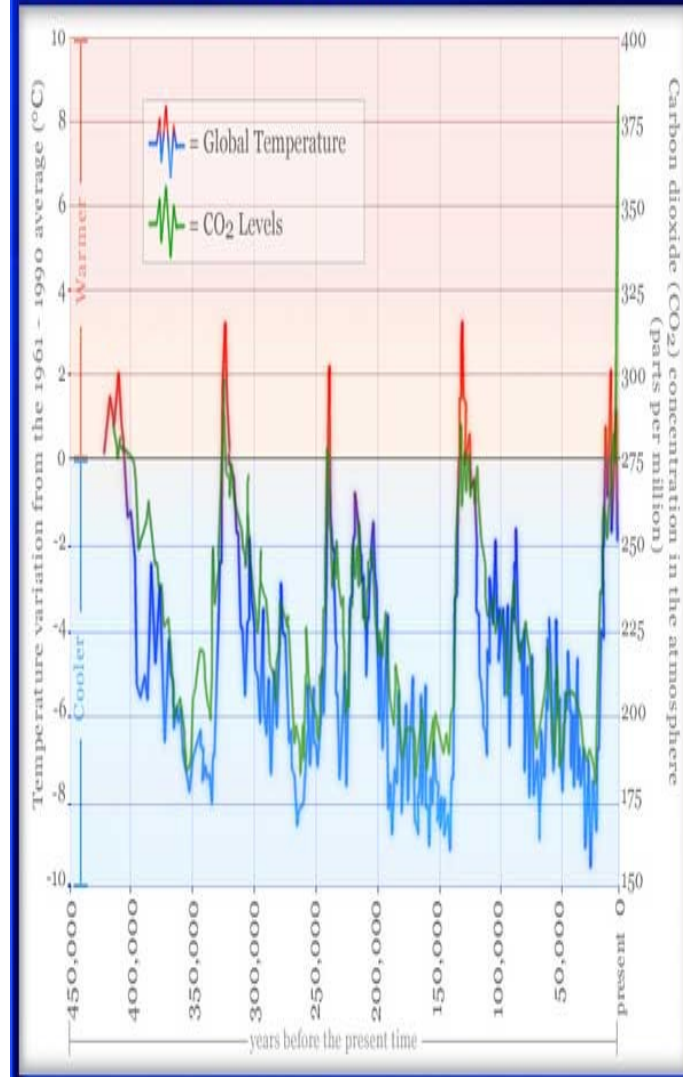
- Climate Security
- Energy Security
- Global Equity



# Climate Security

- Record CO<sub>2</sub> levels
- Earth has enormous thermal mass
- 30-40 years until a new equilibrium is reached
- Locked into at least another 0.6C temp rise

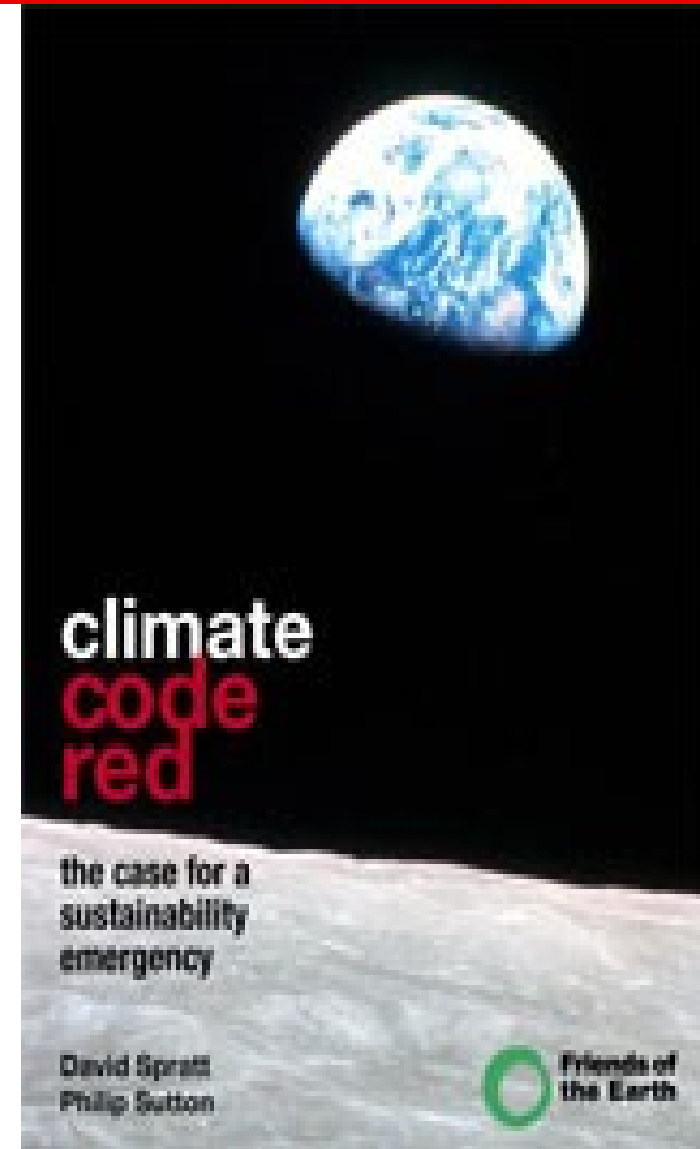
Carbon Dioxide Concentration





# Climate Security

- IPCC 4<sup>th</sup> Assessment Report
- Conservative position
- Lessons to date
- Speed of decision making



# Arctic ice melt

*“Targets of 550ppm must become 350ppm if humanity wishes to preserve a planet similar to that on which civilisation developed”*

James Hanson Nasa Goddard Institute for Space Studies

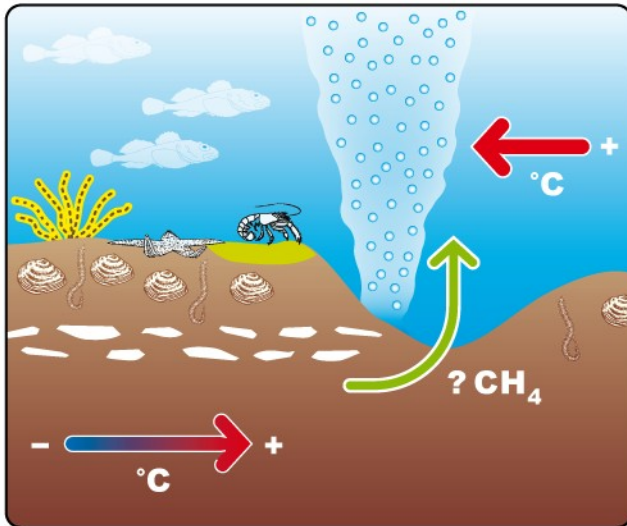
# Failing Sinks

- University of East Anglia gauged CO<sub>2</sub> absorption through more than 90,000 measurements from merchant ships equipped with automatic instruments.
- Results of their 10-year study in the North Atlantic show CO<sub>2</sub> uptake halved between the mid-90s and 2000 to 2005.

*20 October 2007, BBC News*



# Climate Security



- Methane hydrate release
- Emergency Situation
- Transition to Zero Carbon

# Energy Security

- Fossil Fuels are incredible!
- Dense and transportable
- 1 Gallon = 6 weeks labour
- US daily use = 20,000,000 person years of labour

*(Heinberg 2007)*



# Energy Security

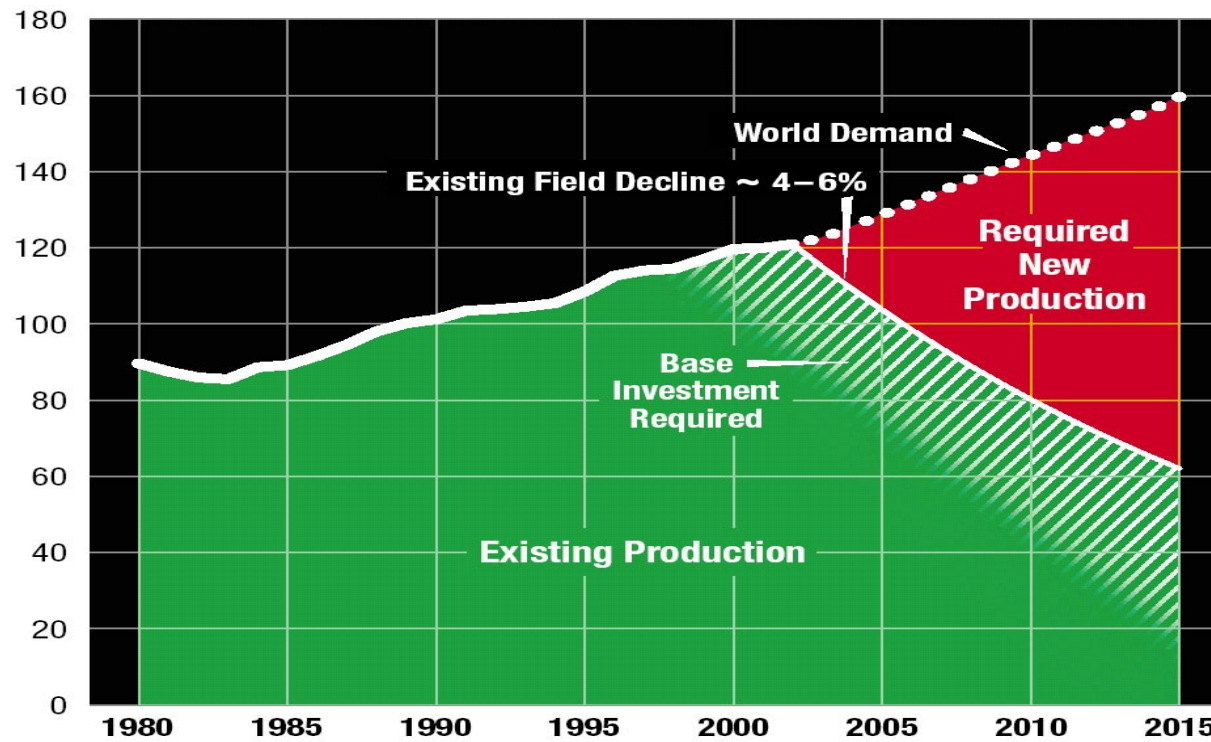
There are currently 98 oil producing countries in the world, of which 64 are thought to have passed their geologically imposed production peak, and of those 60 are in terminal production decline.

(David Strahan [www.energybulletin.net](http://www.energybulletin.net))

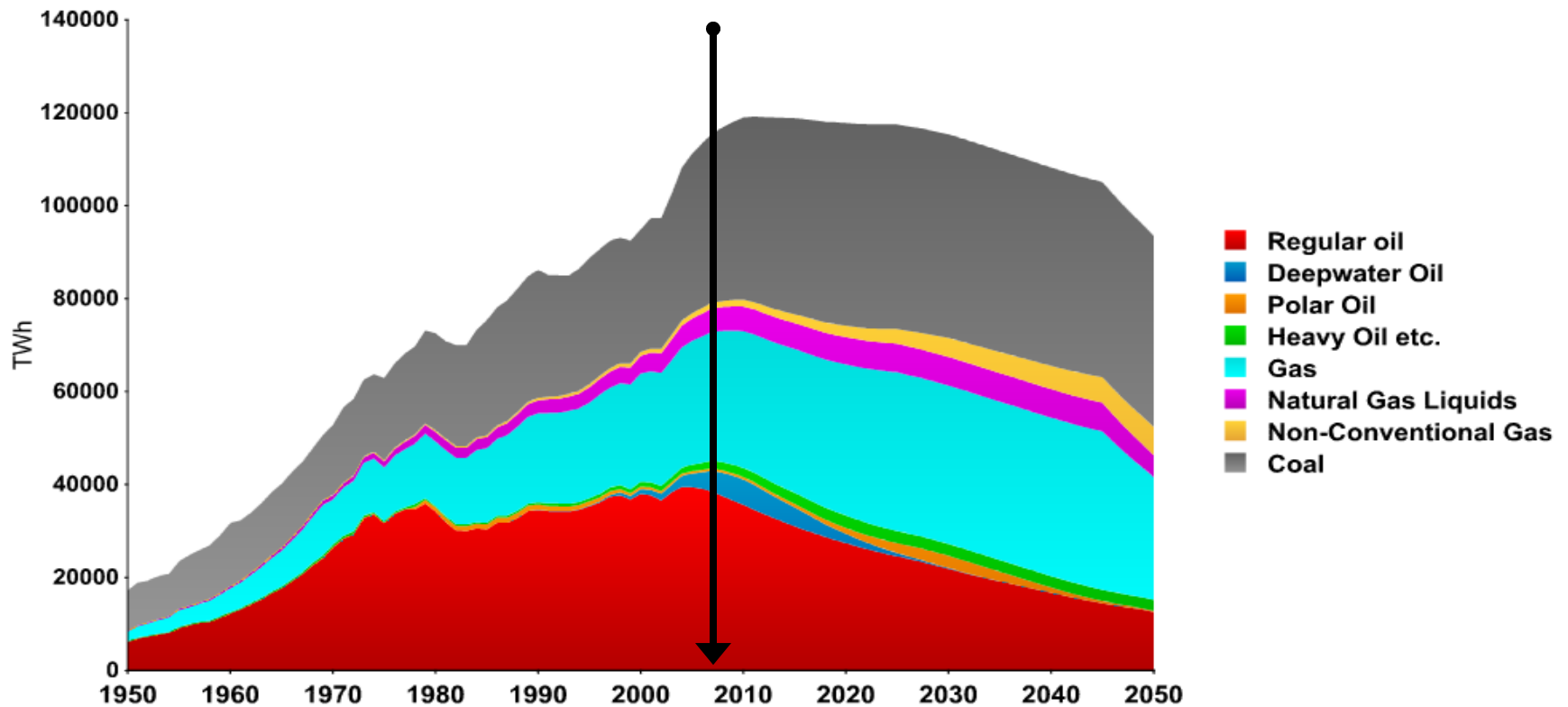


# Energy Security

Millions of Barrels per Day of Oil Equivalent (MBDOE)



# Energy Security





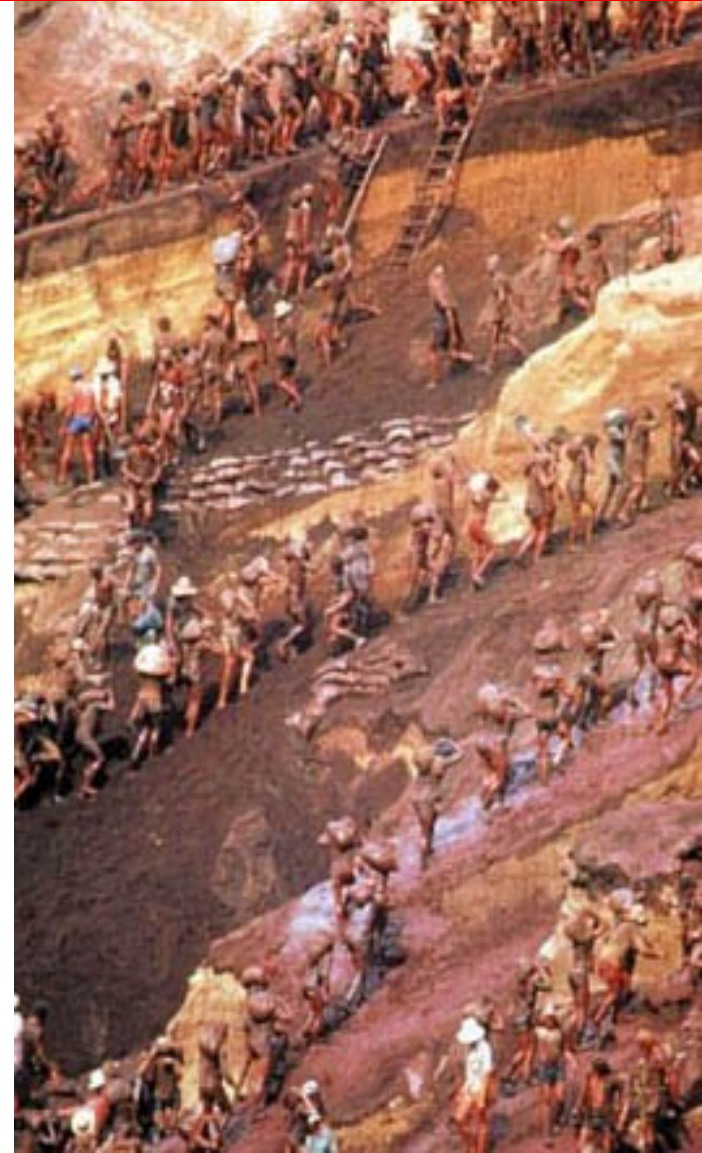
# Energy Security

- A permanent energy crisis
- Production rates become limited by the geology
- Preceded by political limitations?

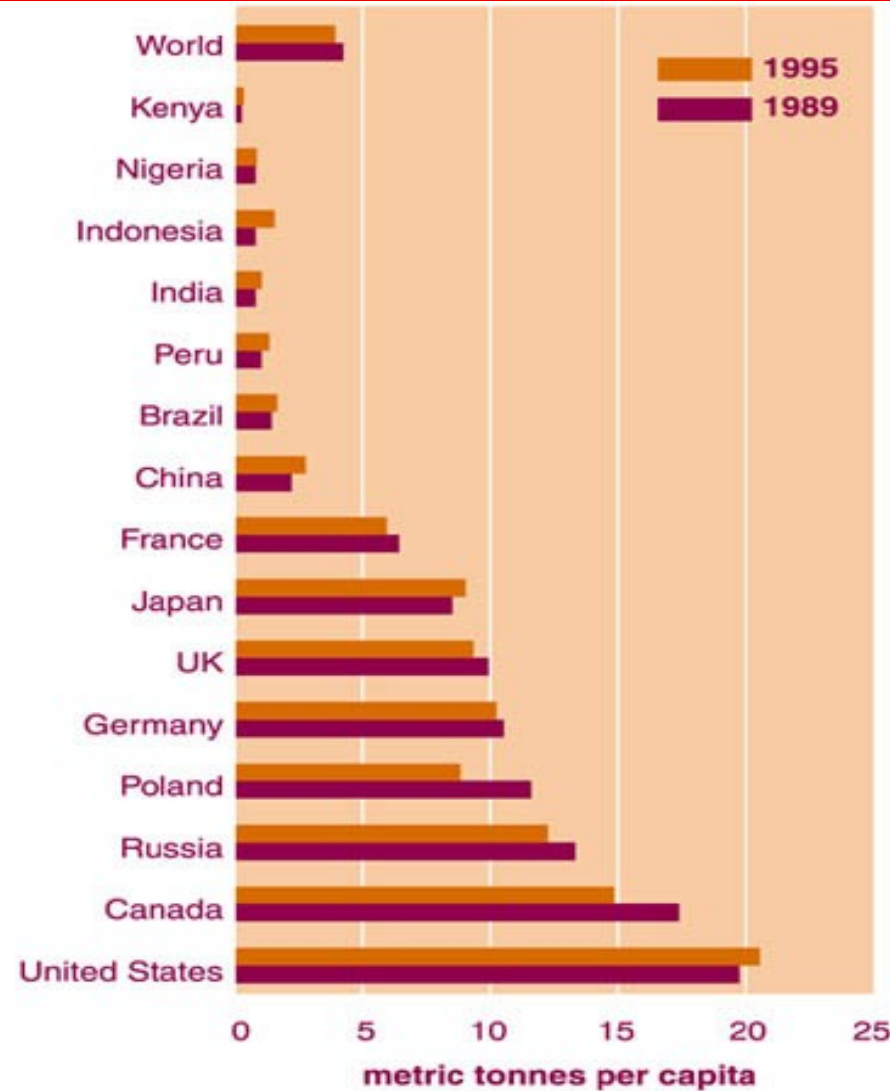


# Global Equity

- The world's **360** wealthiest people have combined income of the poorest **45%** of the world's population (2.3 billion people).
- Britain's GDP = £17,200  
Tanzania's GDP = £420
- A Britain = 10 Tonnes CO<sub>2</sub>  
An Afghani = 0.01 Tonnes CO<sub>2</sub>
- Mounting international tension

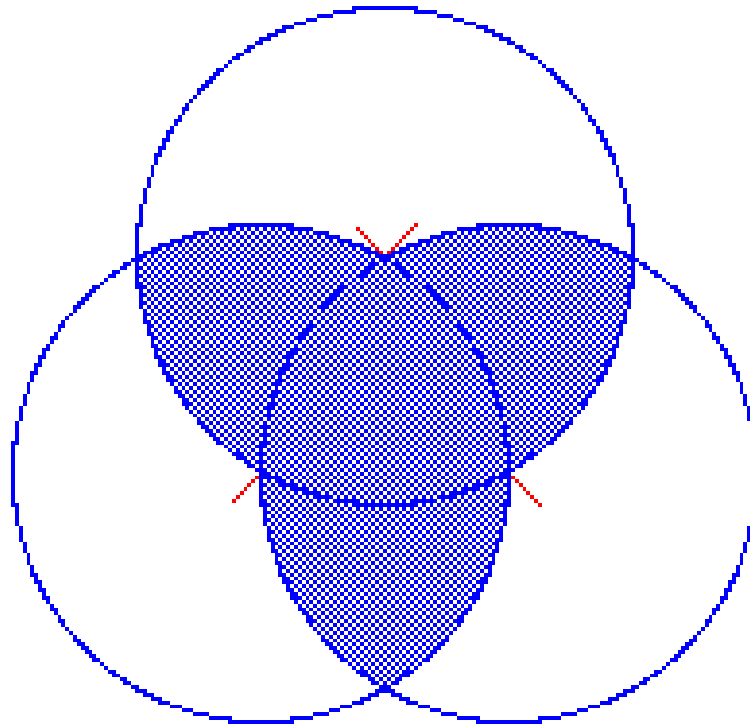


# Global Equity



Source: World Resources Institute, 1992 & 1999

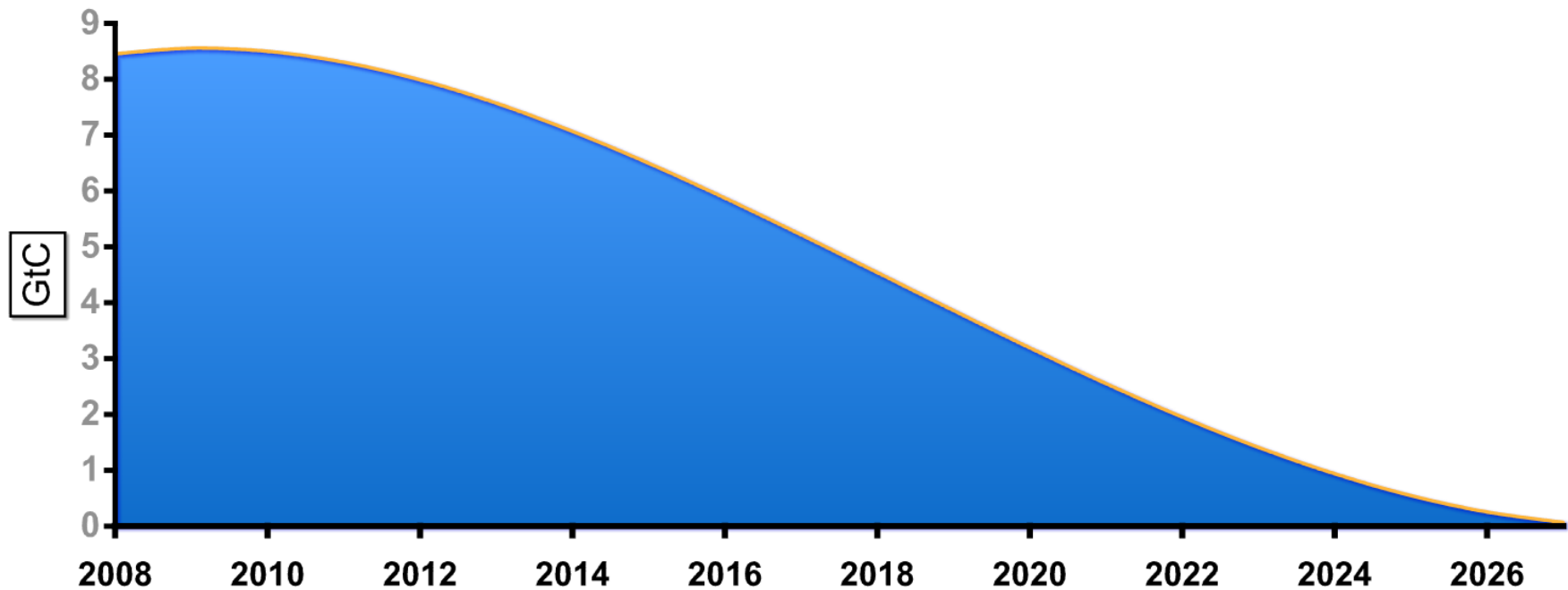
# A common solution



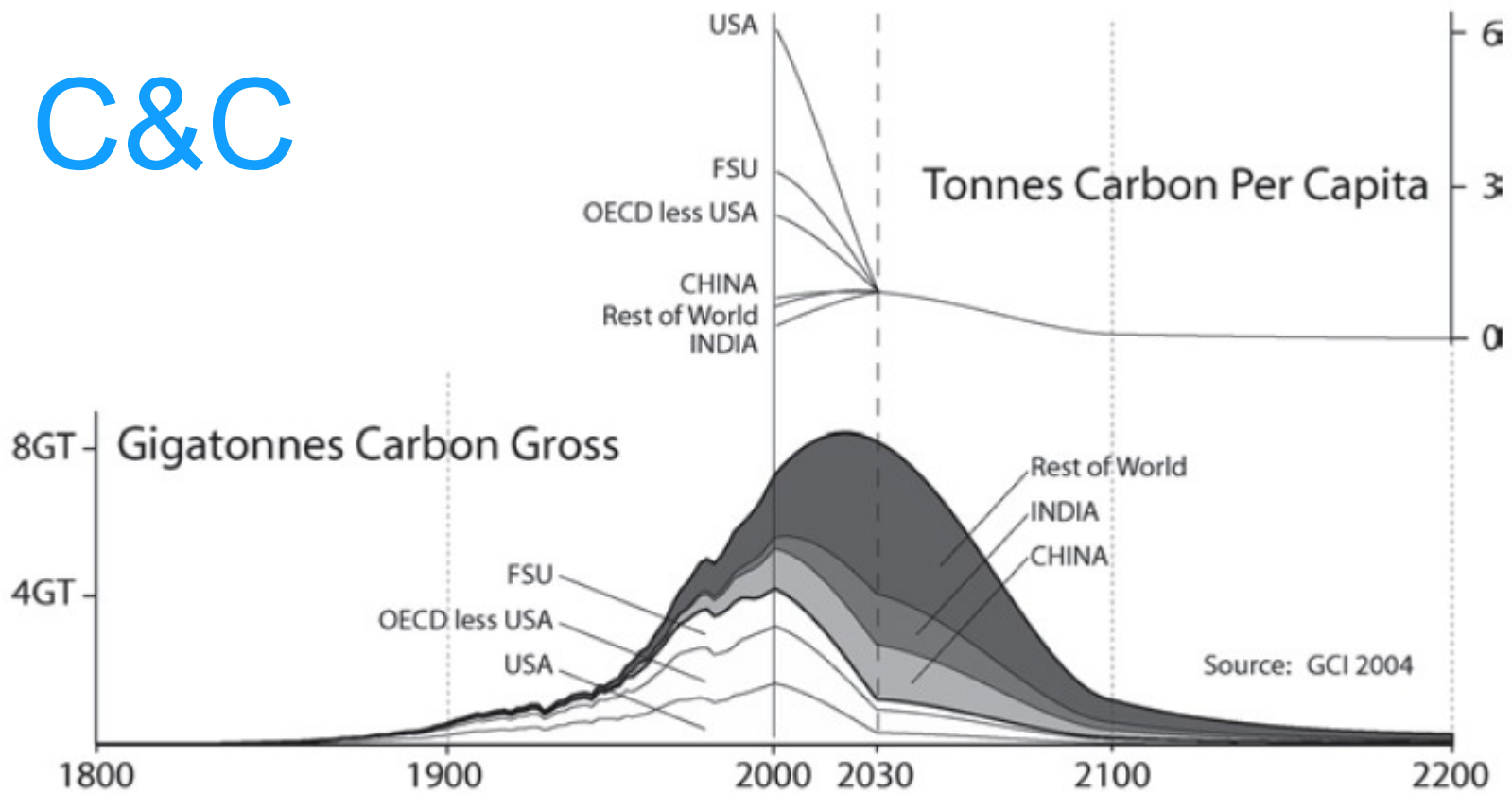
# framework▶

- **International**
  - **Contraction & Convergence**
- **National**
  - **Tradable Energy Quotas (TEQs)**

# Carbon Budget: Global

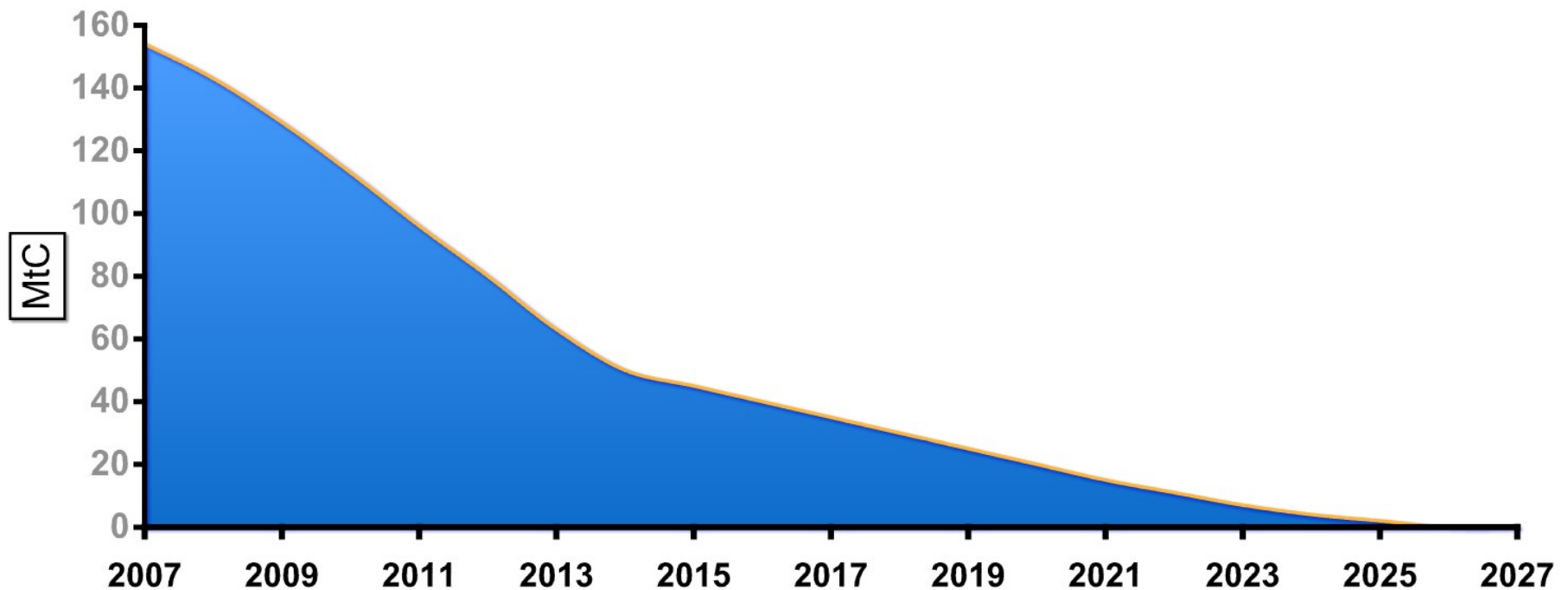


## C&amp;C



This example shows regionally negotiated rates of C&C.  
This example is for a 450ppmv Contraction Budget, Converging by 2030.

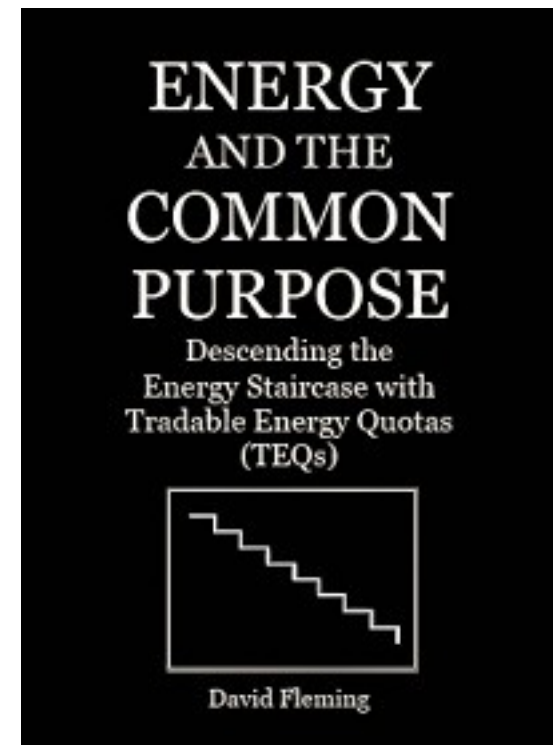
# Carbon Budget: Britain





# Tradable Energy Quotas (TEQs)

- Motivator for change across all sectors
- 40/60 split
  - 40% given free to individuals
  - 60% to auctioned to industry



# TEQs for Individuals

- Only for fuel
- Receive a year's worth at the start
- Topped up weekly
- Tradable!
- Safety net

# TEQs for Business

- Market rules were set when the industrial world was awash with fossil fuels & before climate change was recognised
- The market is driven by the lowest cost option – it is carbon-blind
- So, in delivering our needs, it releases far more carbon than is actually necessary

# Carbon Blind Markets



# De-carbonisation options:

- Widespread re-nationalisation?
- A command & control economy?
- To be directed by Government?
- Carbon-conscious market reform?

# TEQs for Business

- Carbon-conscious market reform
- Initially a year's worth put up for tender
- Weekly tender follows - 1 year in advance of use
- Budget looks ahead, provides certainty
- Purchased through banks
- Other taxation reduced

# Carbon conscious markets

- Use the power of the market
- Make carbon visible
- Lowest carbon = most economic
- A 'market-driven' race out of carbon
- Driving technology innovation

# ‘Island Britain’ Scenario

power**down**  


power**up**  




# powerdown

- Sector by Sector
  - Household
  - Industry
  - Transport
  - Agriculture & Services
- 50% overall reduction



# Household

- Mass retro-fit of existing stock
- Zero-carbon standards for all new-build
- Replace worst performing dwellings
- Intelligent appliances
- Behaviour change

# Transport

- Transition to electric vehicles will result in huge savings
- Freight to rail
- Modal switches - “Earthports”
- V2G systems

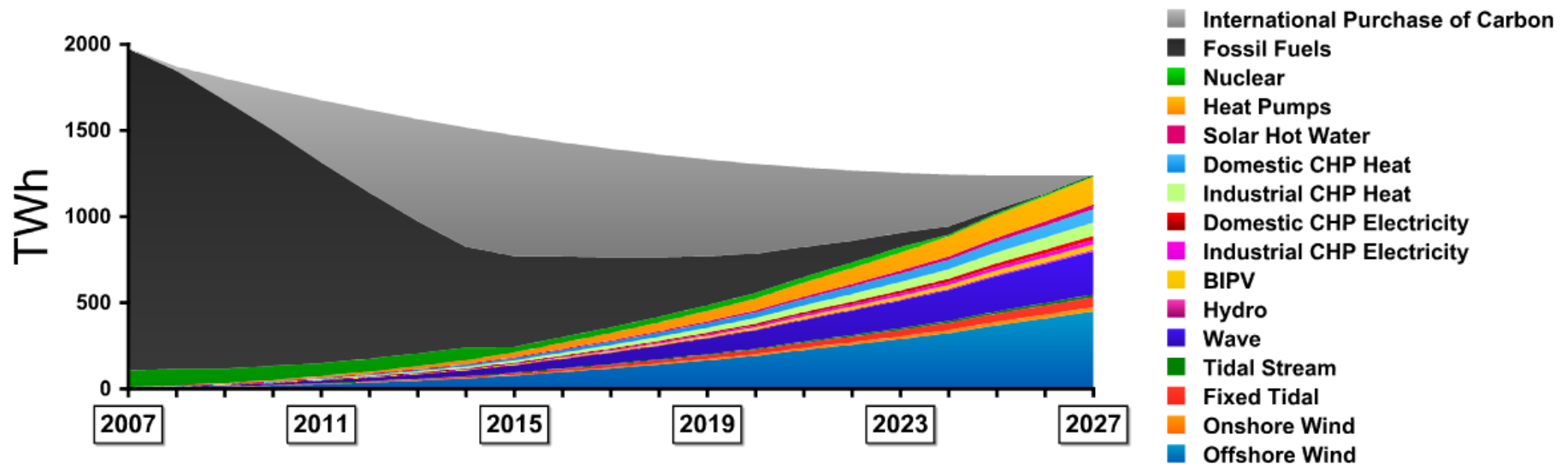
# Agriculture

- Re-localisation
- Reduction in livestock
- Switch to “organic”
- On-farm biofuels for farm machinery only
- Significant land-use changes



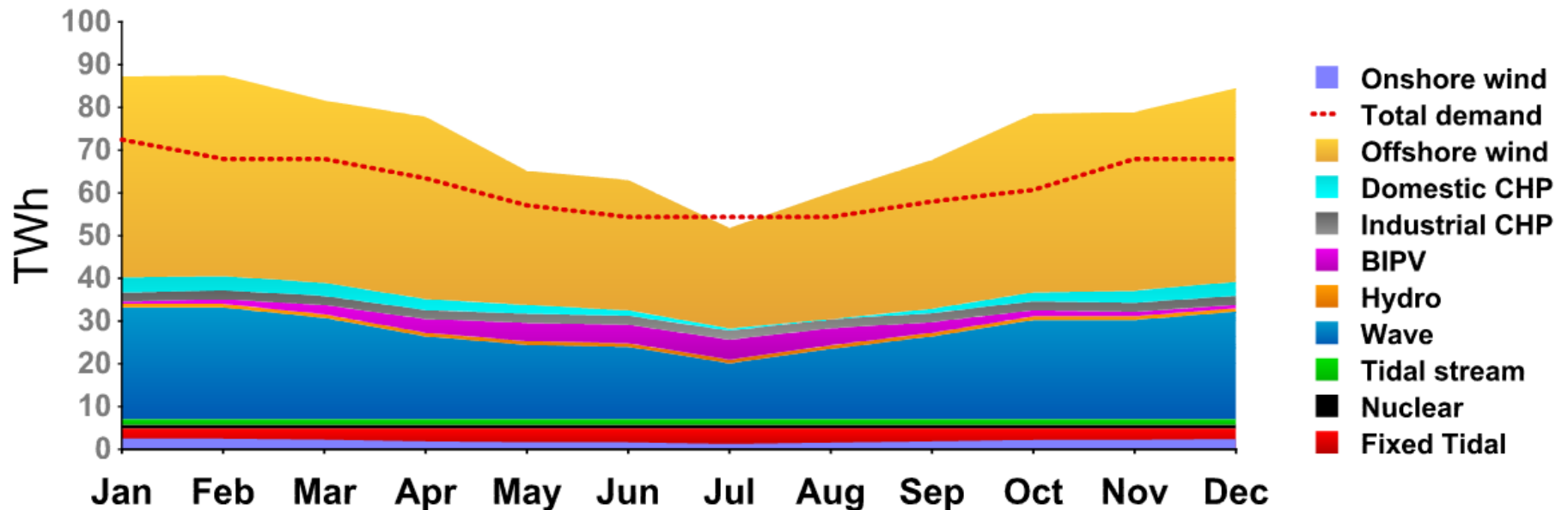
- 100% Renewable!
- Electric Britain
- Diverse mix

# The resources are out there



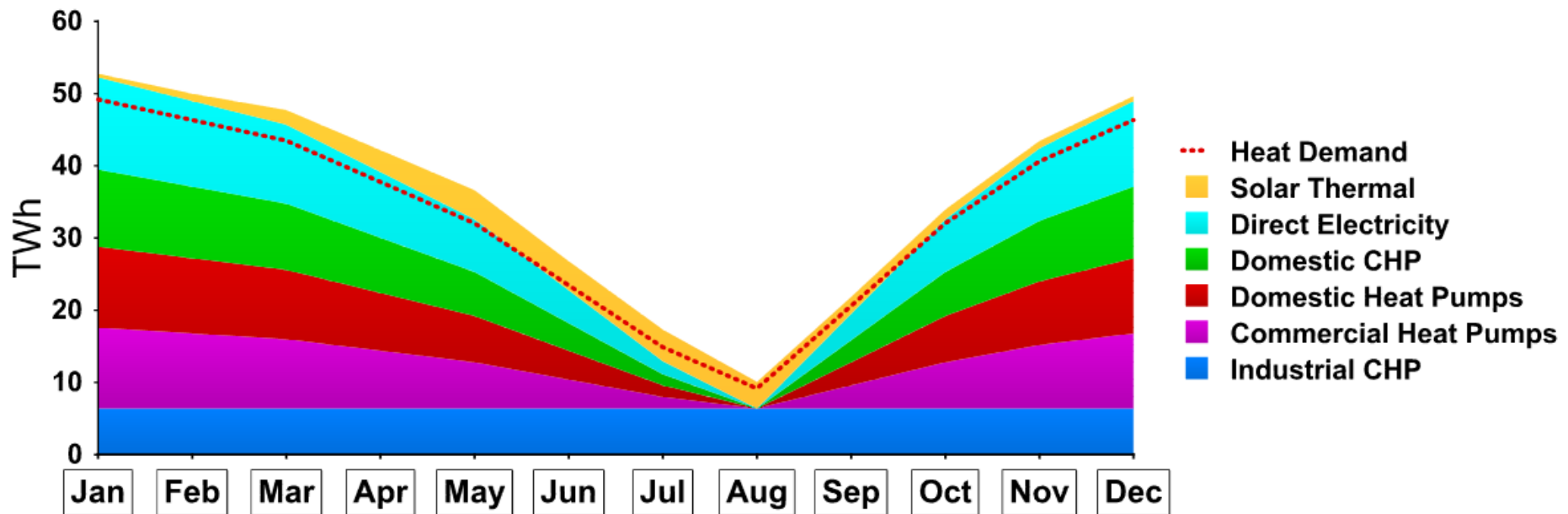
# The Saudi Arabia of **wind** power

# Electricity supply & demand

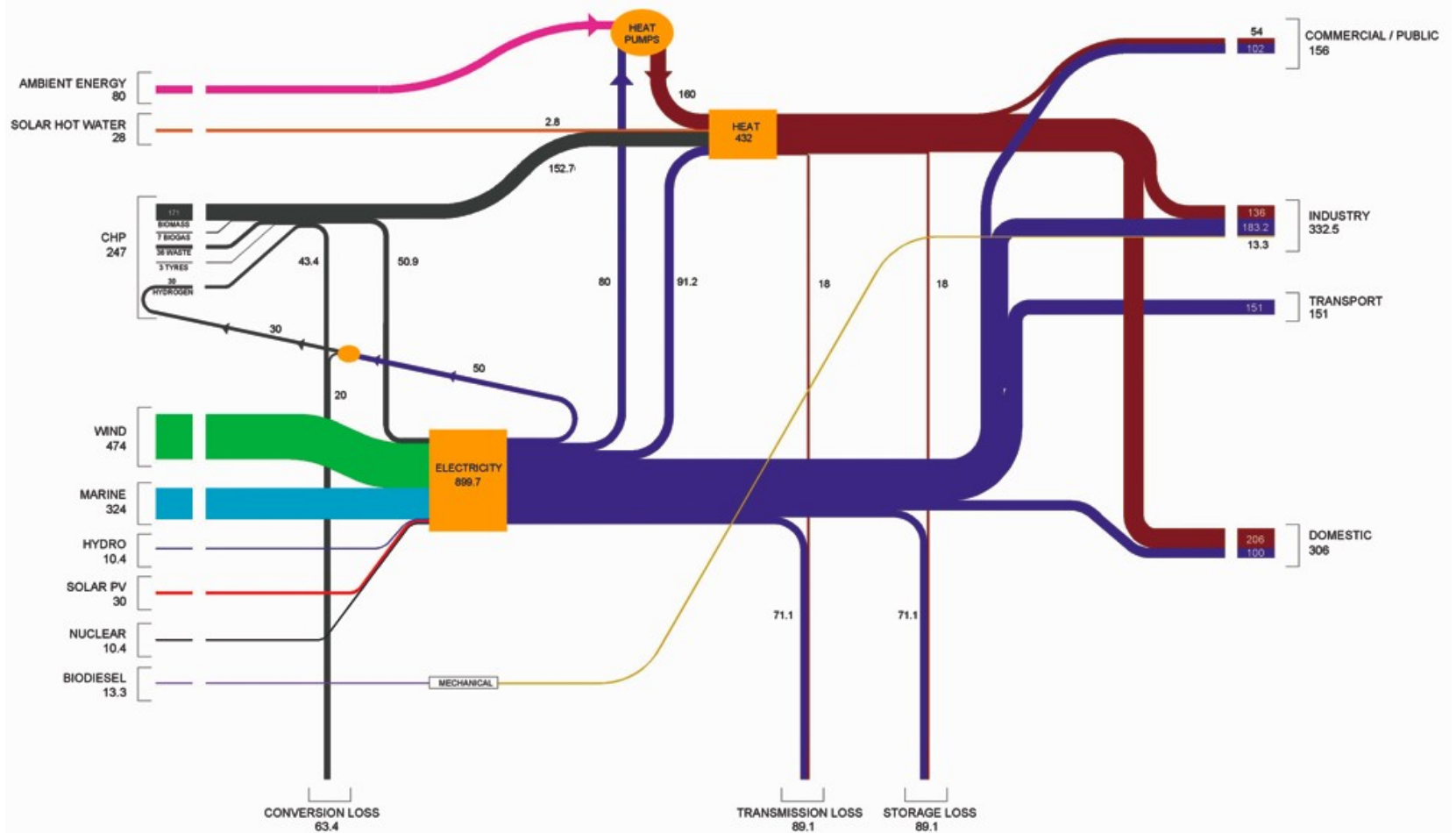




# Heat supply & demand



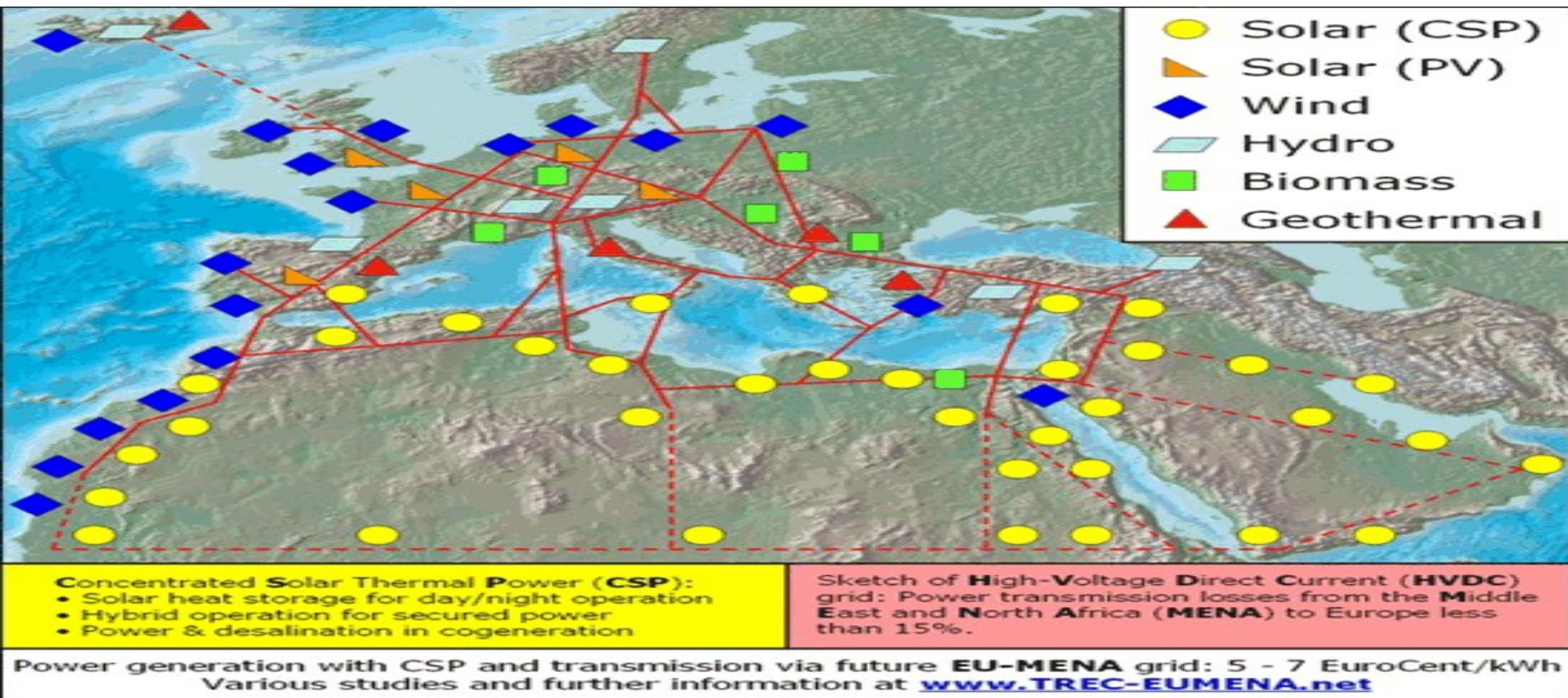
# UK **Potential** Energy Flows 2027 (terawatt hours)



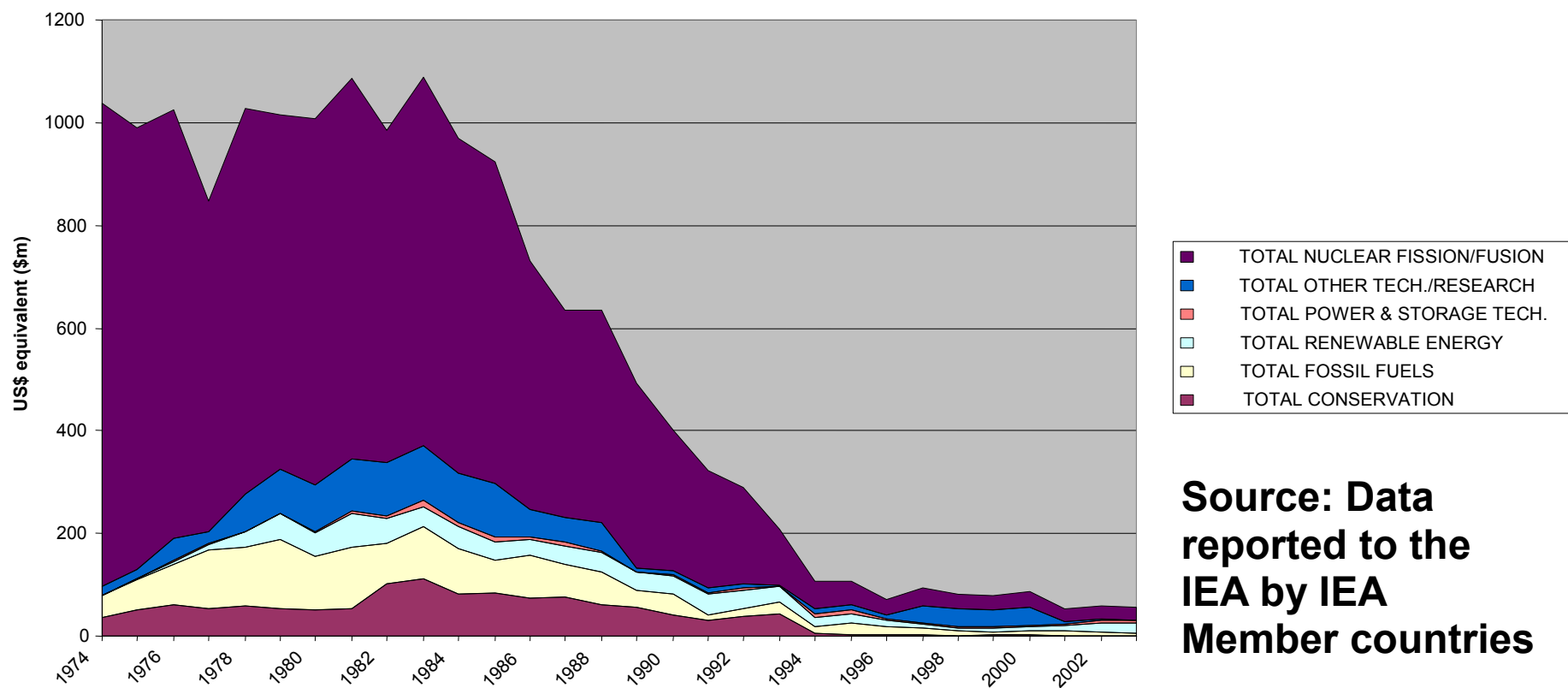
# Variability

- Demand
  - Reduced overall by 50%
  - Intelligent demand management
- Generation distributed by region & by technology
- Storage - V2G, flow batteries, pumped storage
- **European Integration in next scenario...**

# Integrated EU scenario



# Energy research 1974-2004



# Vital Catalysts

- Robust cross-party consensus
- Constantly up-dated climate research
- Pan EU awareness campaign
- Accelerated technology R&D
- Accredited training across EU



**WISE: work on-site began July 2007**





# WISE: a unique learning environment





# WISE: for CAT Graduate School of the Environment



**WISE: Opens end of 2008!**



# Conclusions

- Scientifically inescapable
- Economically unavoidable
- Technically achievable
- It must now become **socially & politically thinkable**
- A new optimism!



# Where next?

- Pan-EU 27 scenario
- Collaboration
- Annually up-dated report
- Presented at the COPs in Poznan (2008) & Copenhagen (2009)



Report available free from

**[www.zerocarbonbritain.com](http://www.zerocarbonbritain.com)**



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