



**Think Globally,  
~~Act Locally.~~  
personally!**

Llandeilo, March 2007

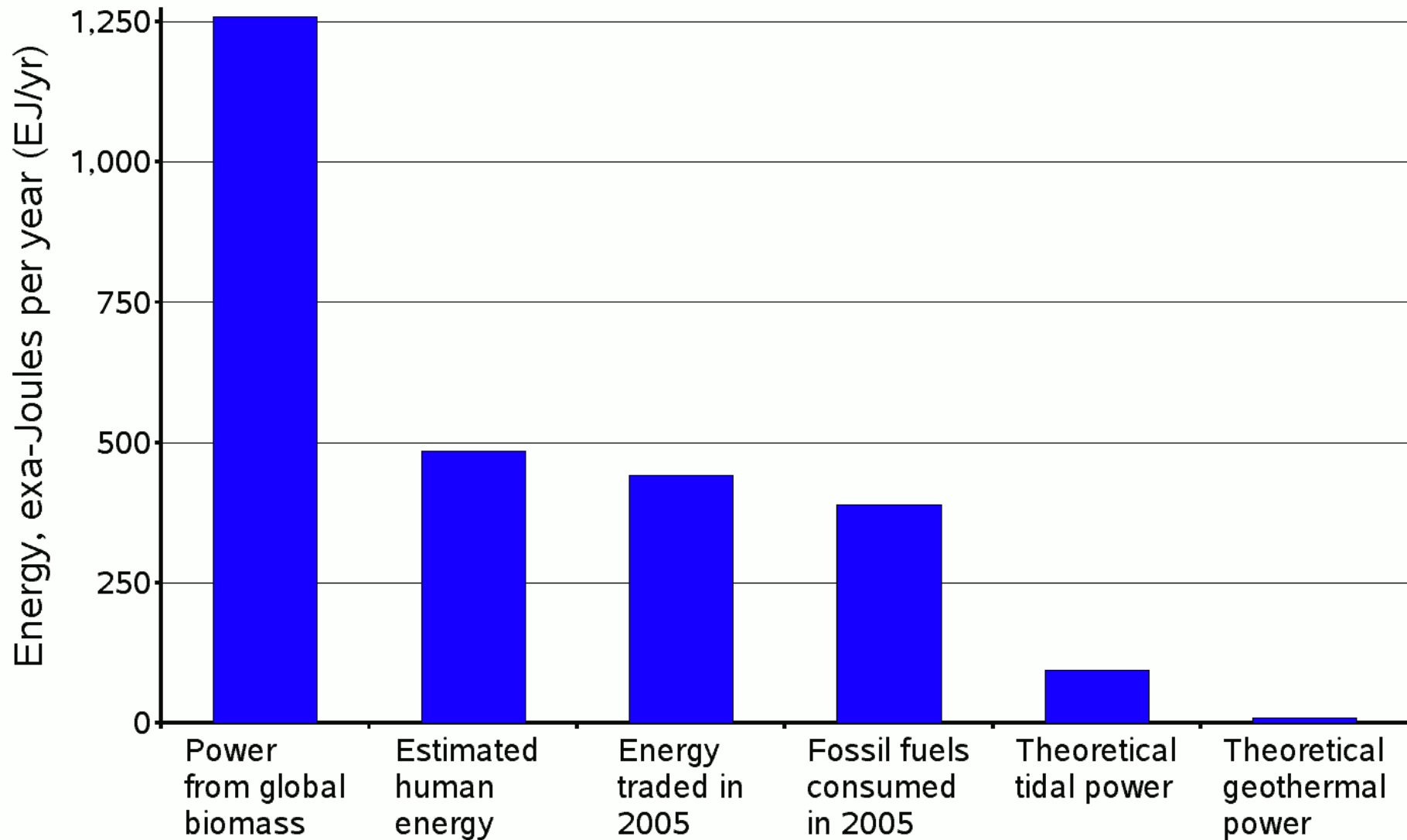
**We all make waves**



**We all make waves**

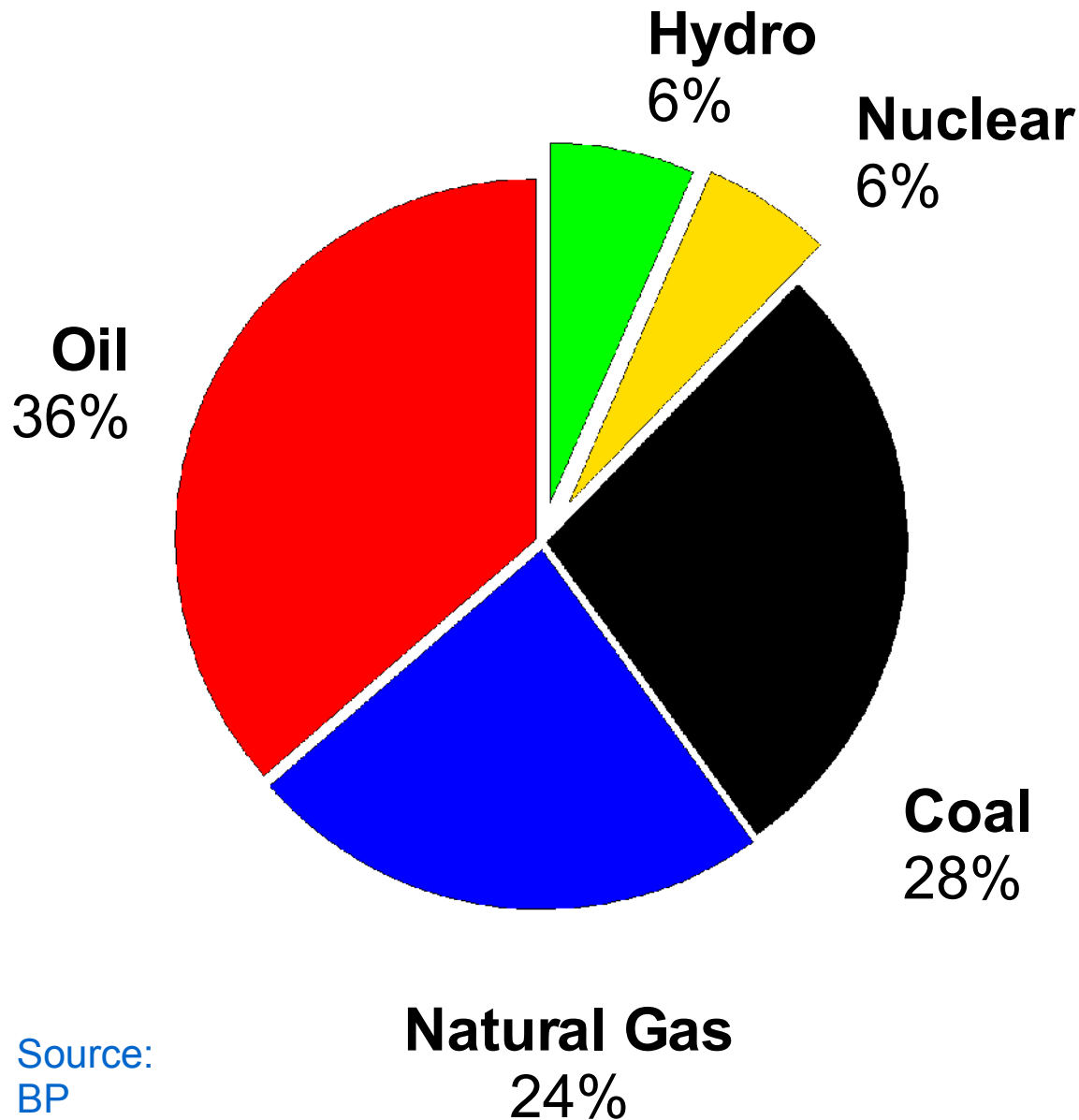
**...but don't blame the water**

# The Scale of Human Energy Use



Source:  
BP/Open University

# Globally Traded Energy, 2005

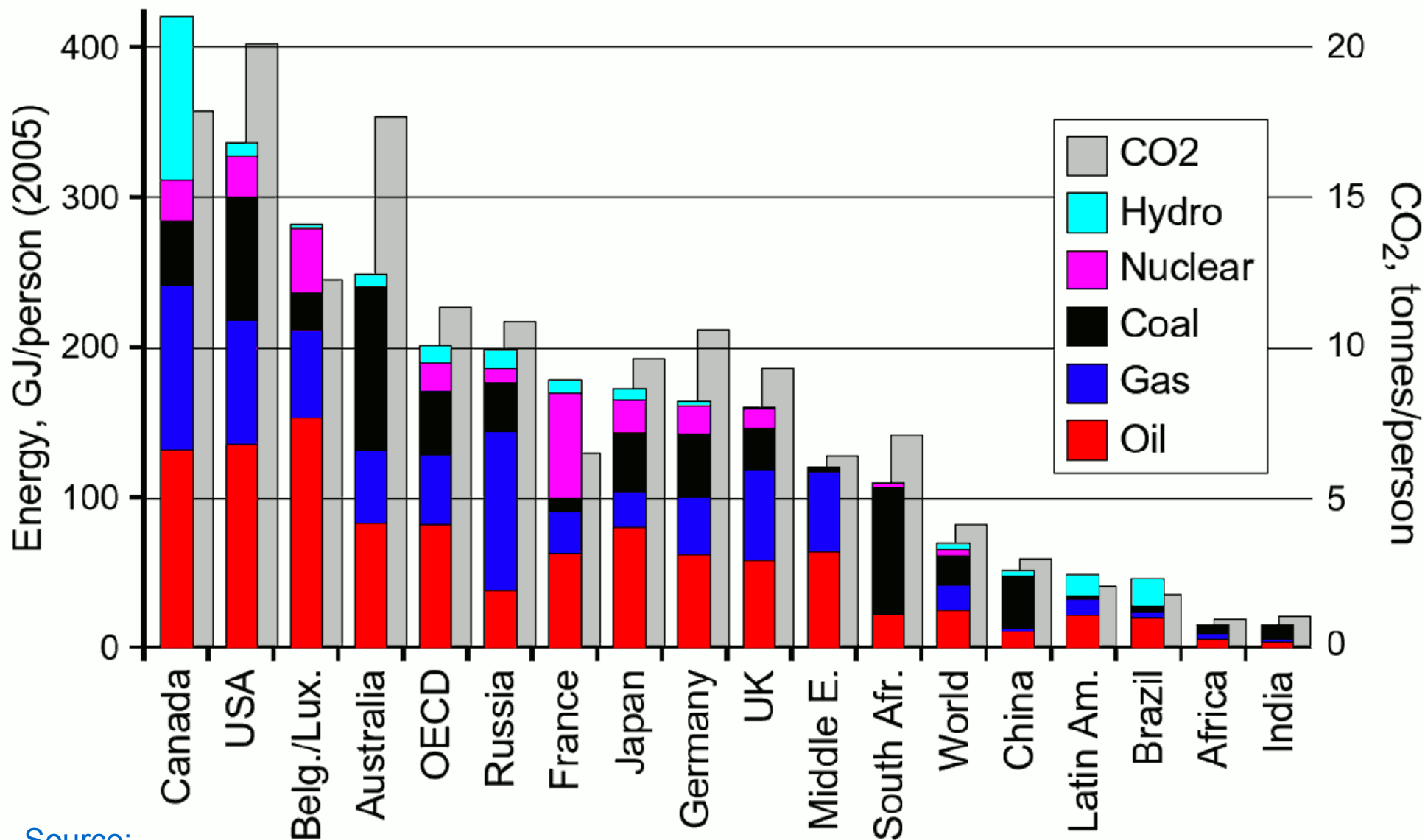


<u>Consumption:</u>	EJ
Oil	161
Natural Gas	104
Coal	123
Nuclear	26
Hydro	28
<b>Total</b>	<b>442</b>

**88% fossil fuels!**

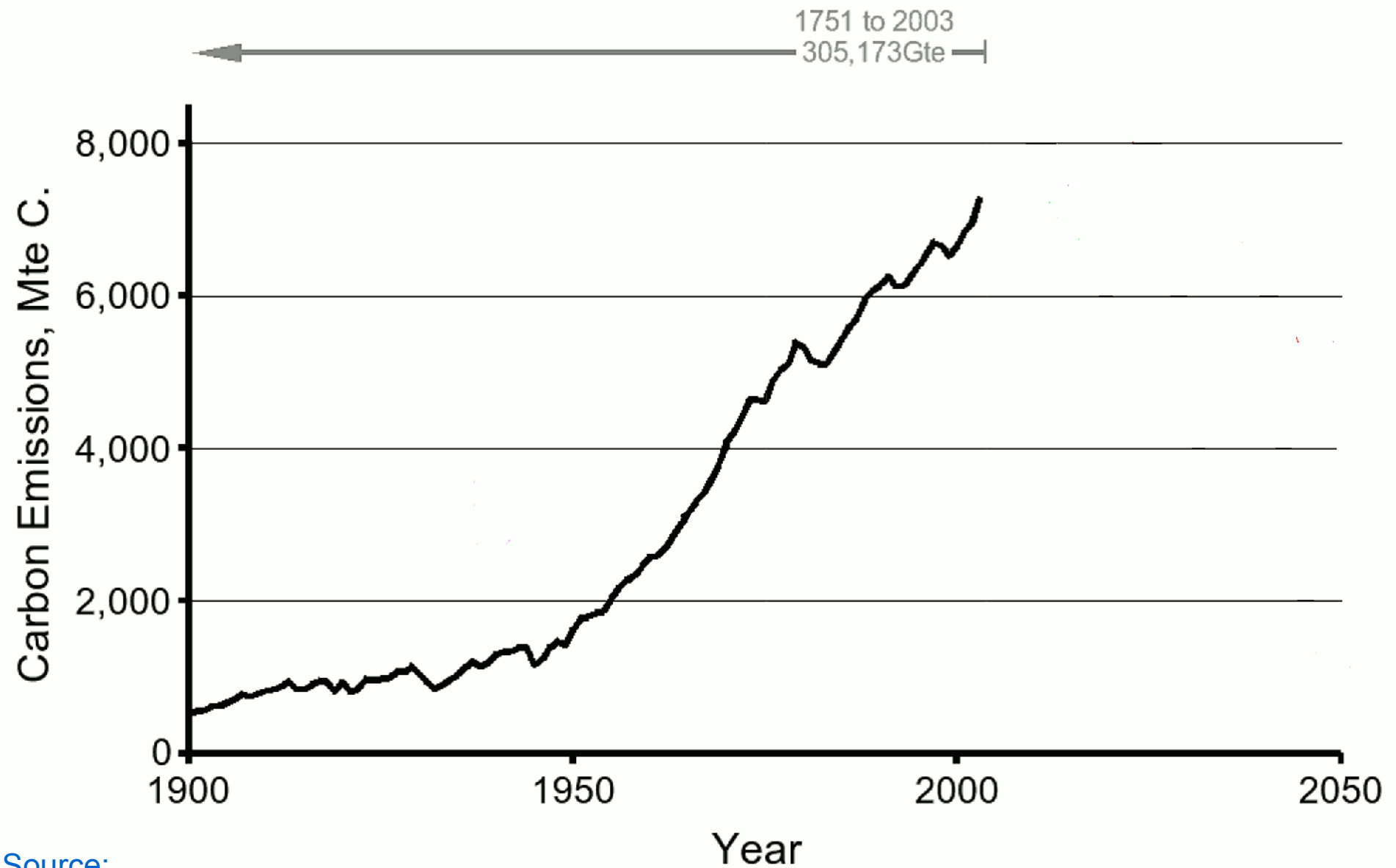
Source:  
BP

# Energy and Inequality



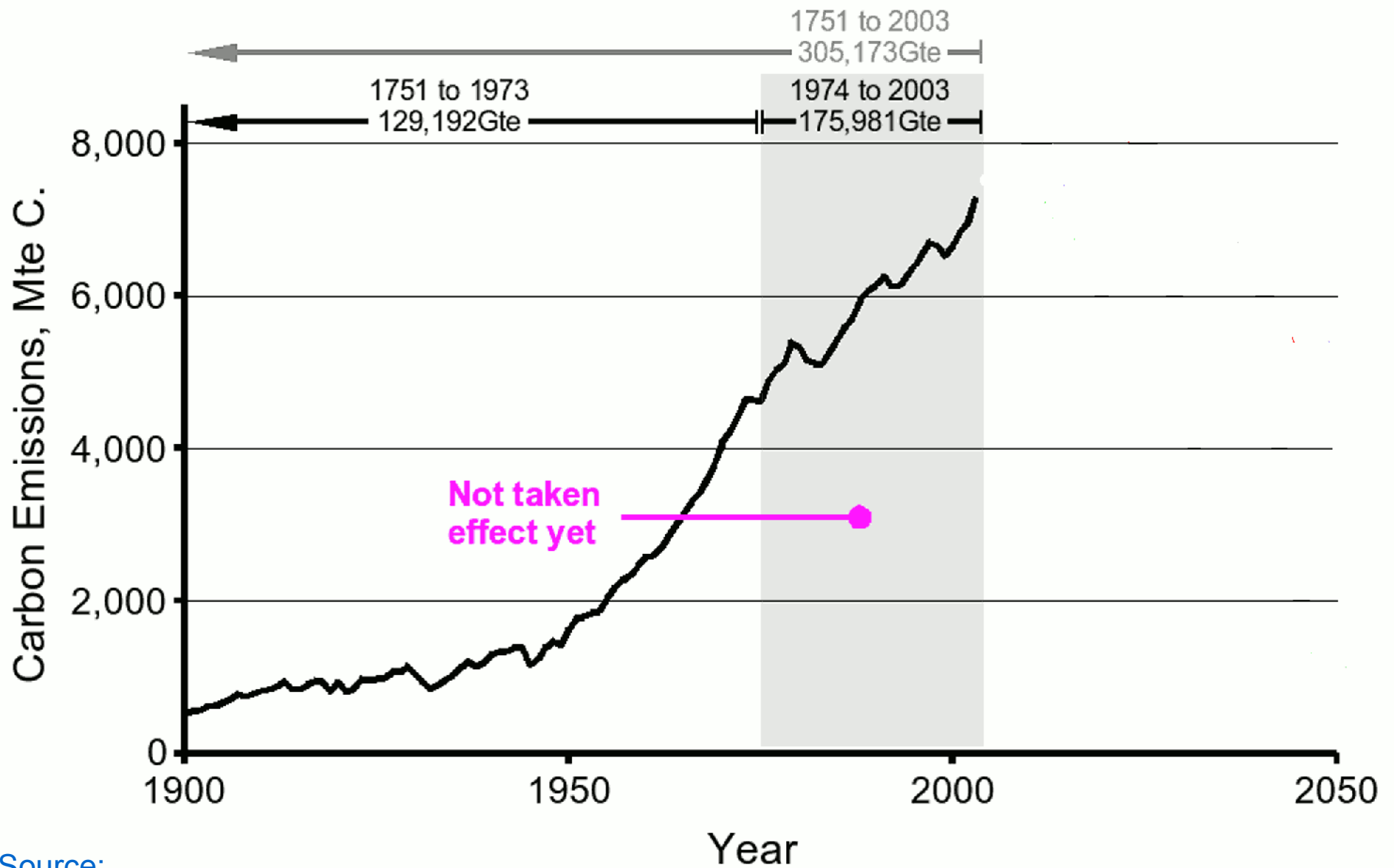
Source:  
BP/USEIA

# Carbon Emissions



Source:  
Oak Ridge National Laboratory

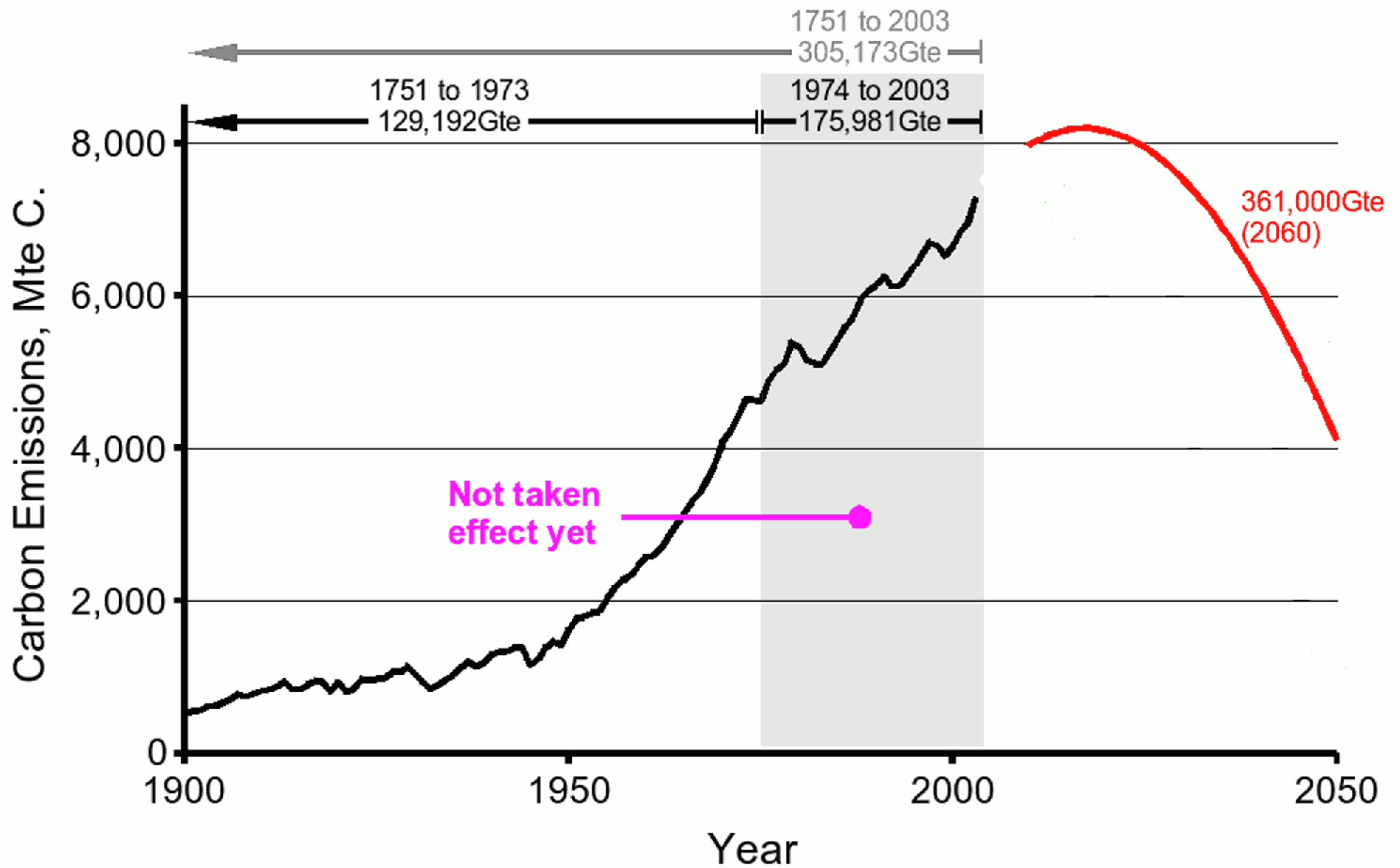
# Carbon Emissions



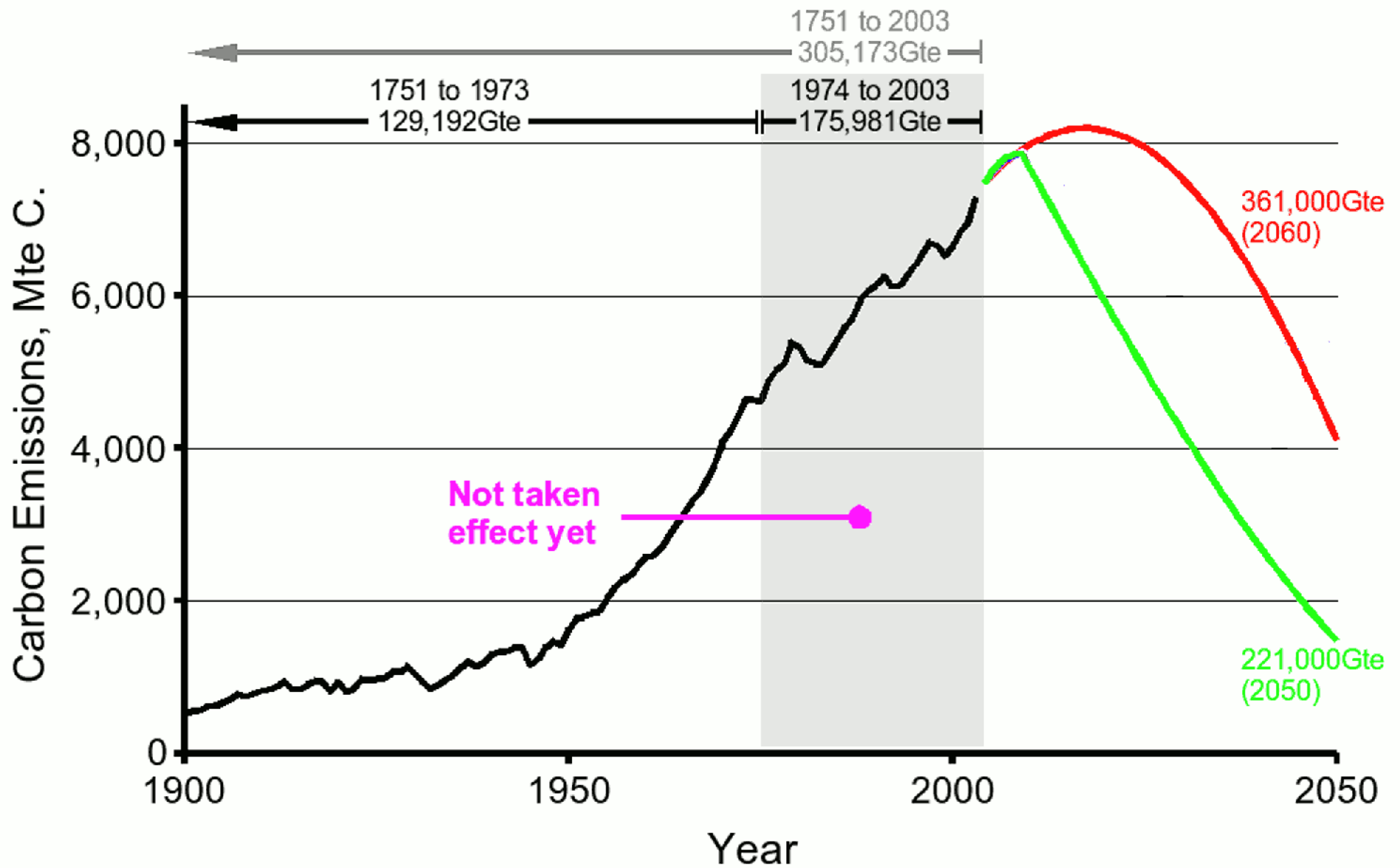
Source:  
Oak Ridge National Laboratory



# Carbon Emissions

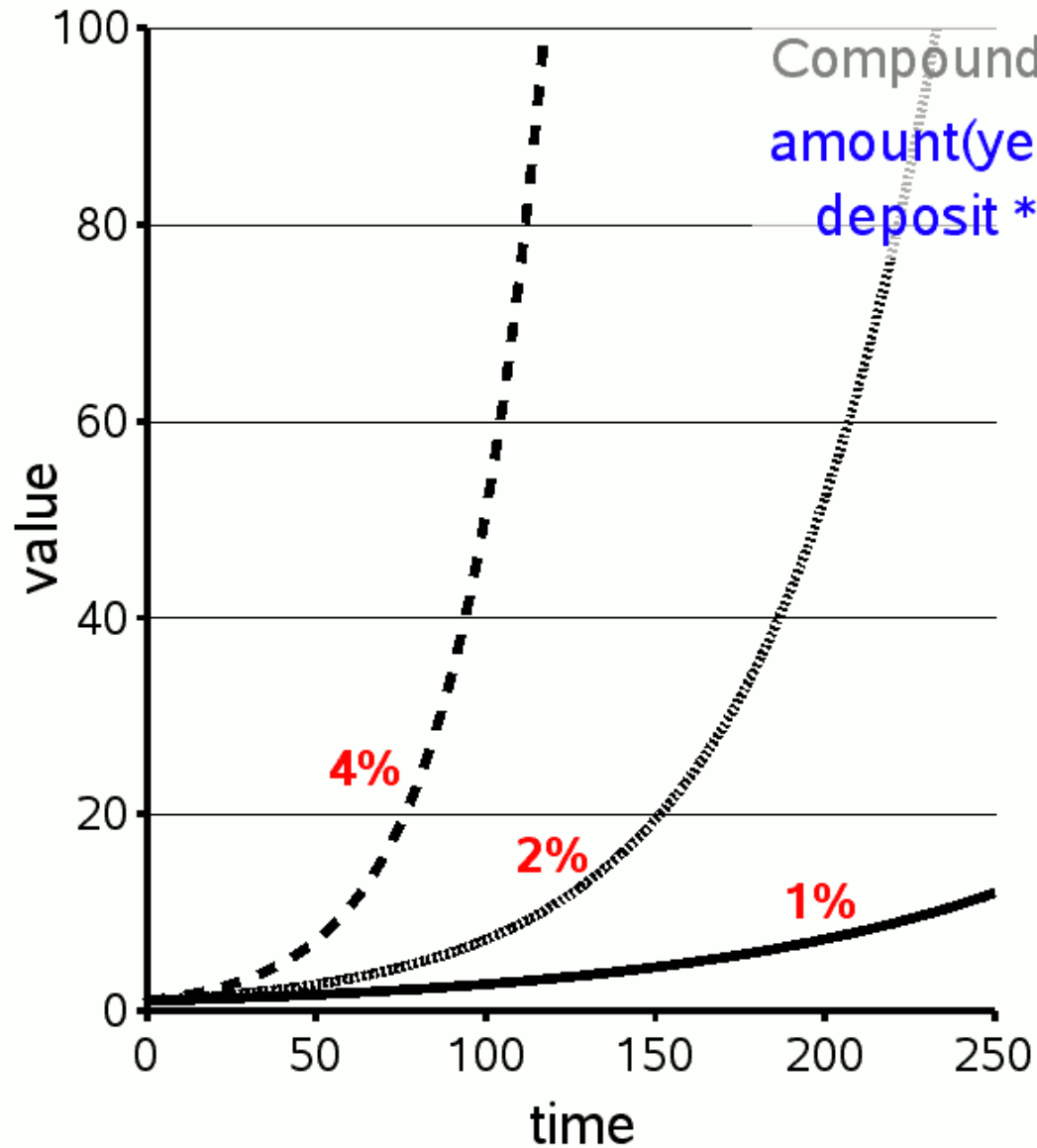


# Carbon Emissions



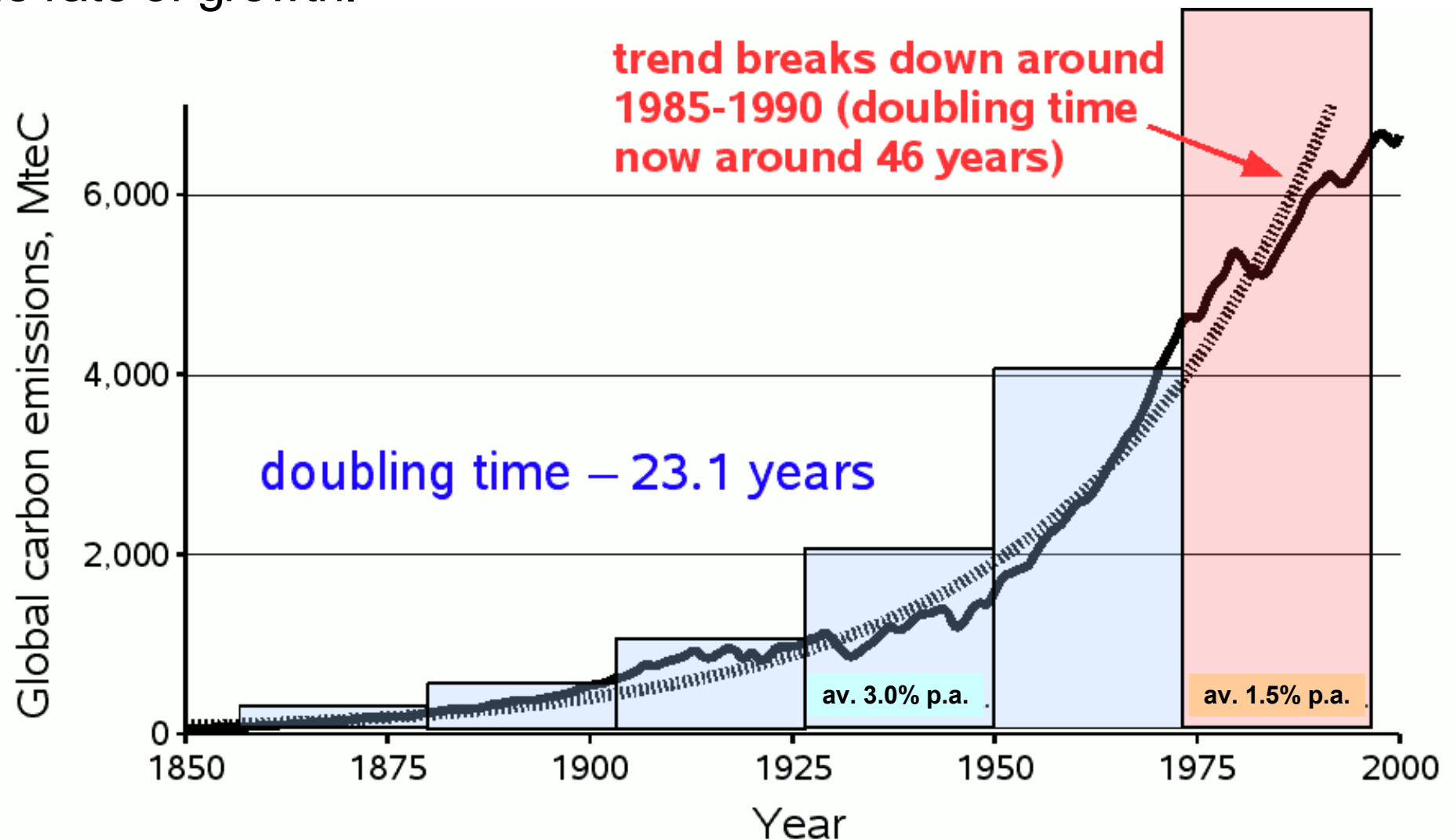
# Exponential Growth

Exponential (or geometric) growth occurs when the growth rate of a function is always proportional to the function's current size. An everyday example is compound interest.



# Doubling Time

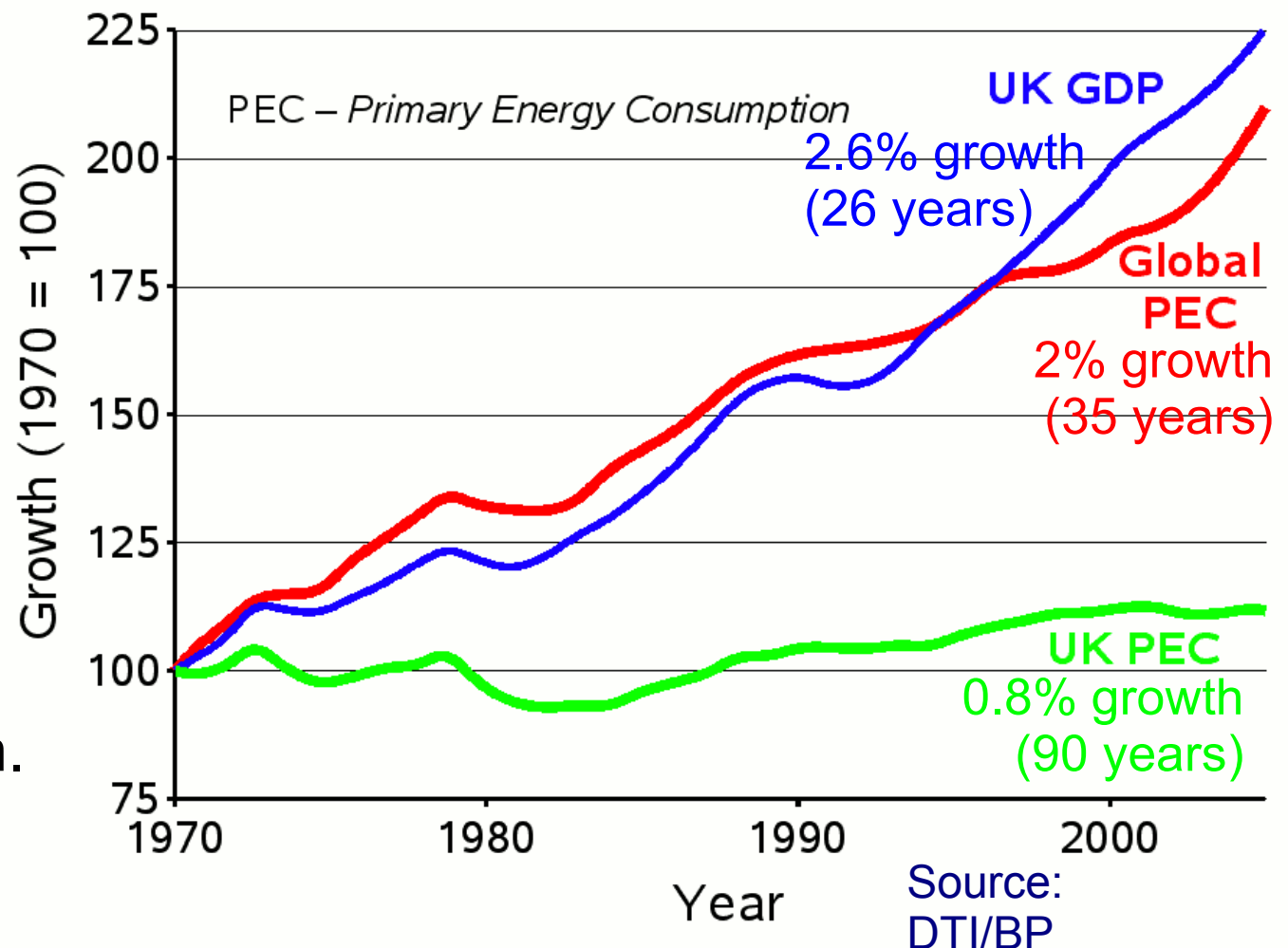
Where growth is exponential, the value will double over a fixed period of time – the “doubling time”. This can be estimated by dividing 70 by the rate of growth.



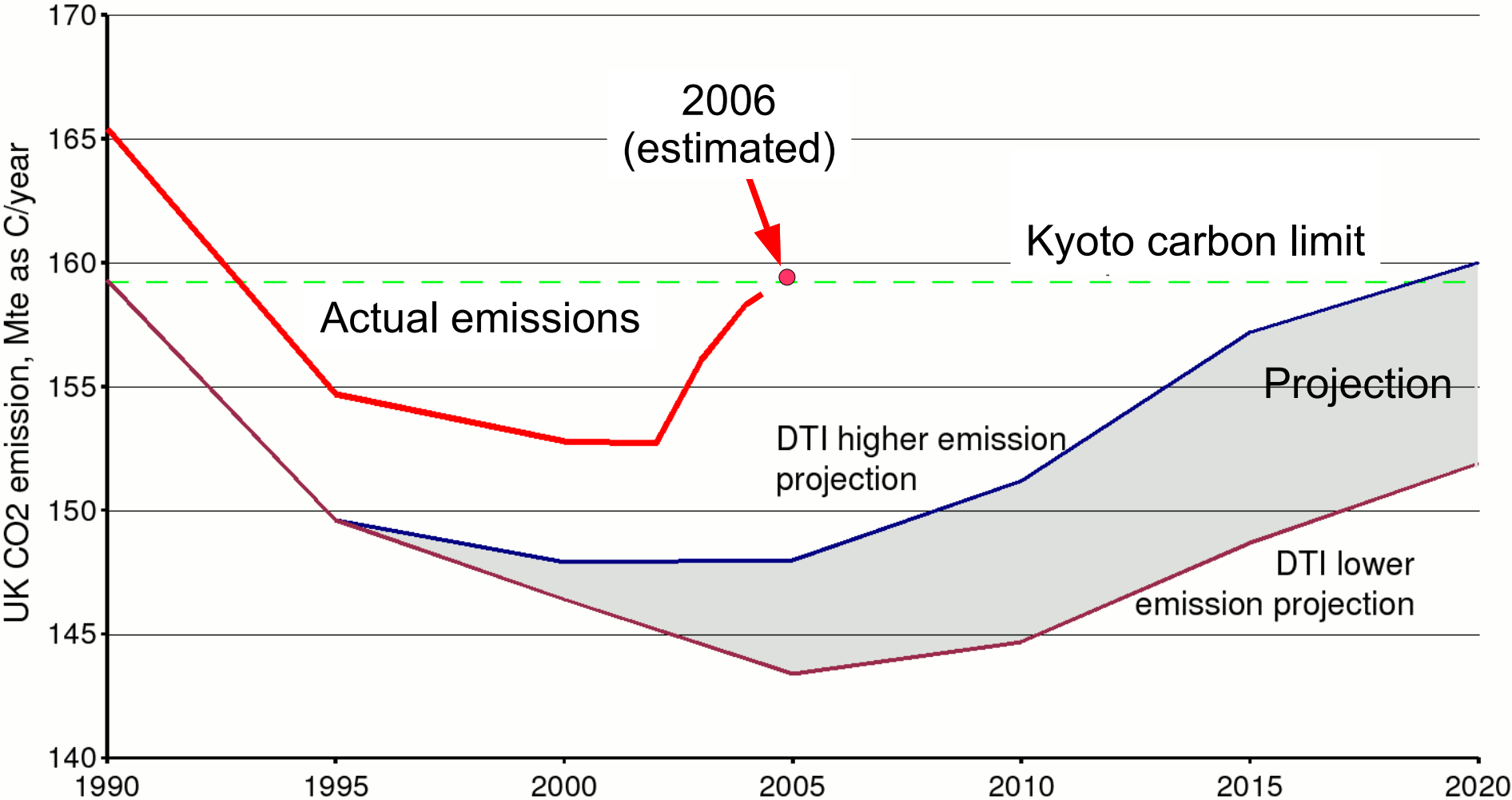
# Gross Domestic Product

GDP is used by modern economists and politicians as a measure of economic well-being, but as it values “well-being” in purely economic terms its use is questionable.

GDP and energy consumption are closely coupled. But in the UK and some other states this link has been broken, primarily by the greater use of (more efficient) natural gas, or by the “off-shoring” of economic production.

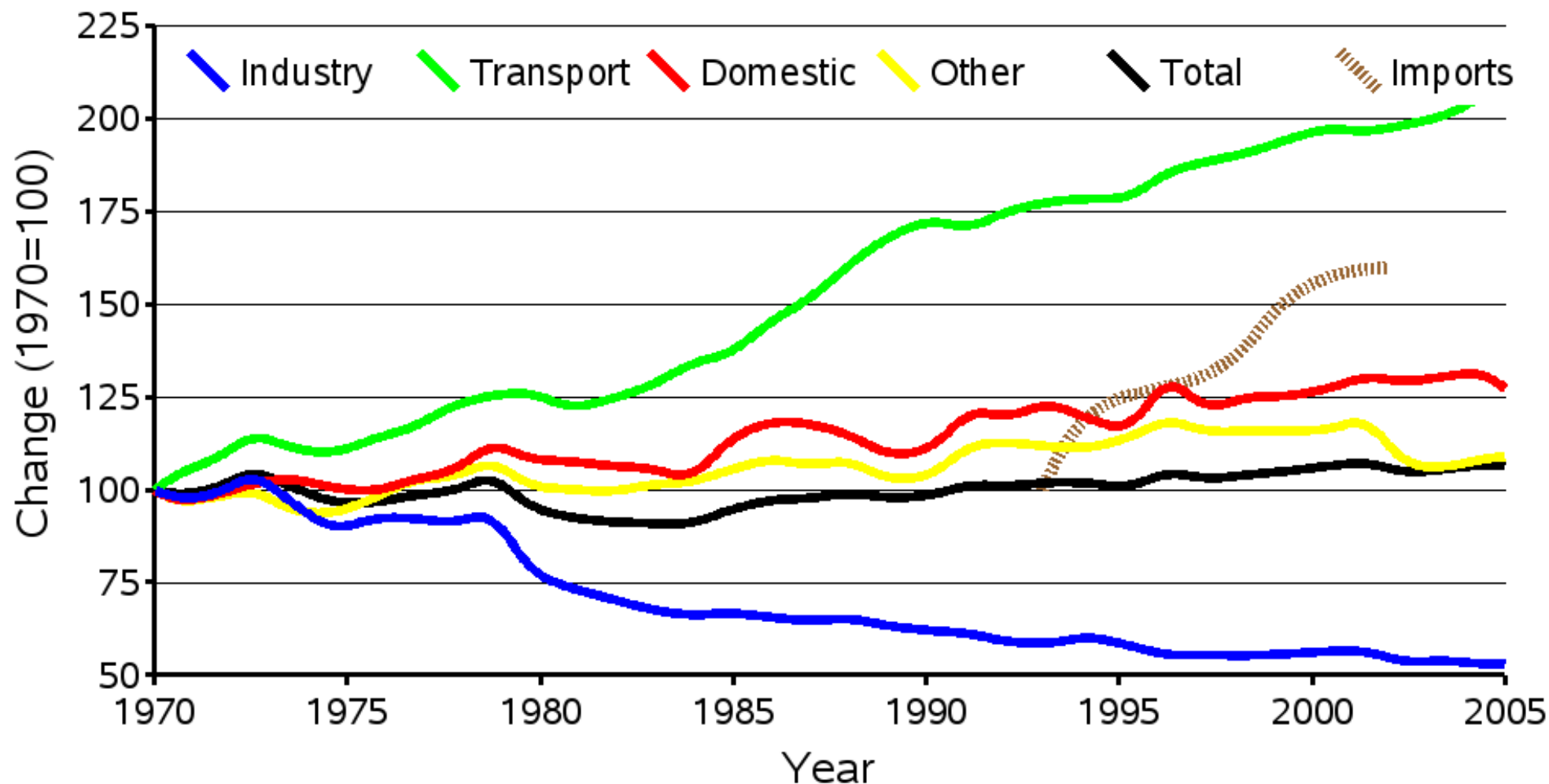


# UK Carbon Emissions



Source:  
DEFRA/DTI

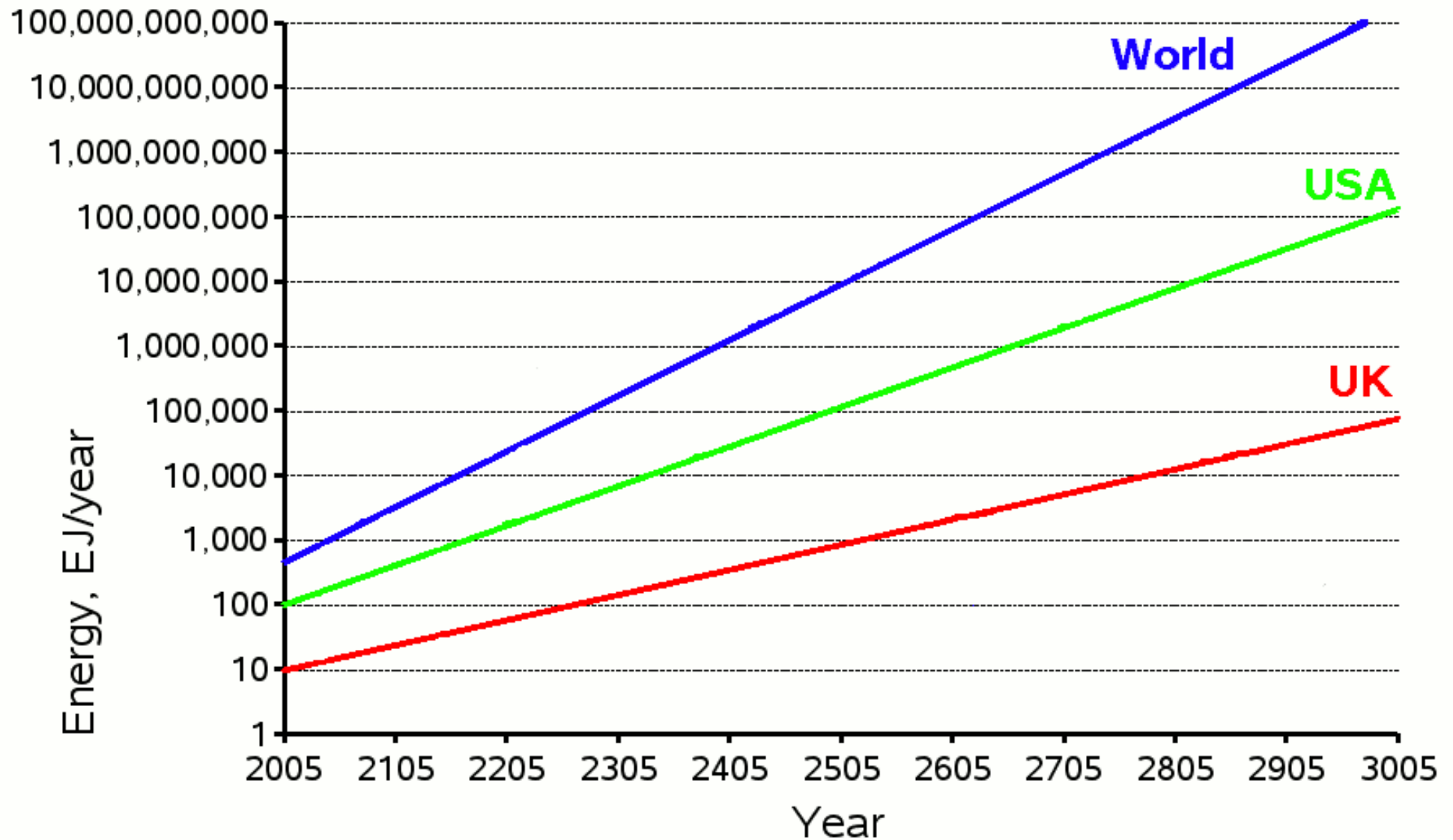
# Change in UK Energy Consumption



Source:

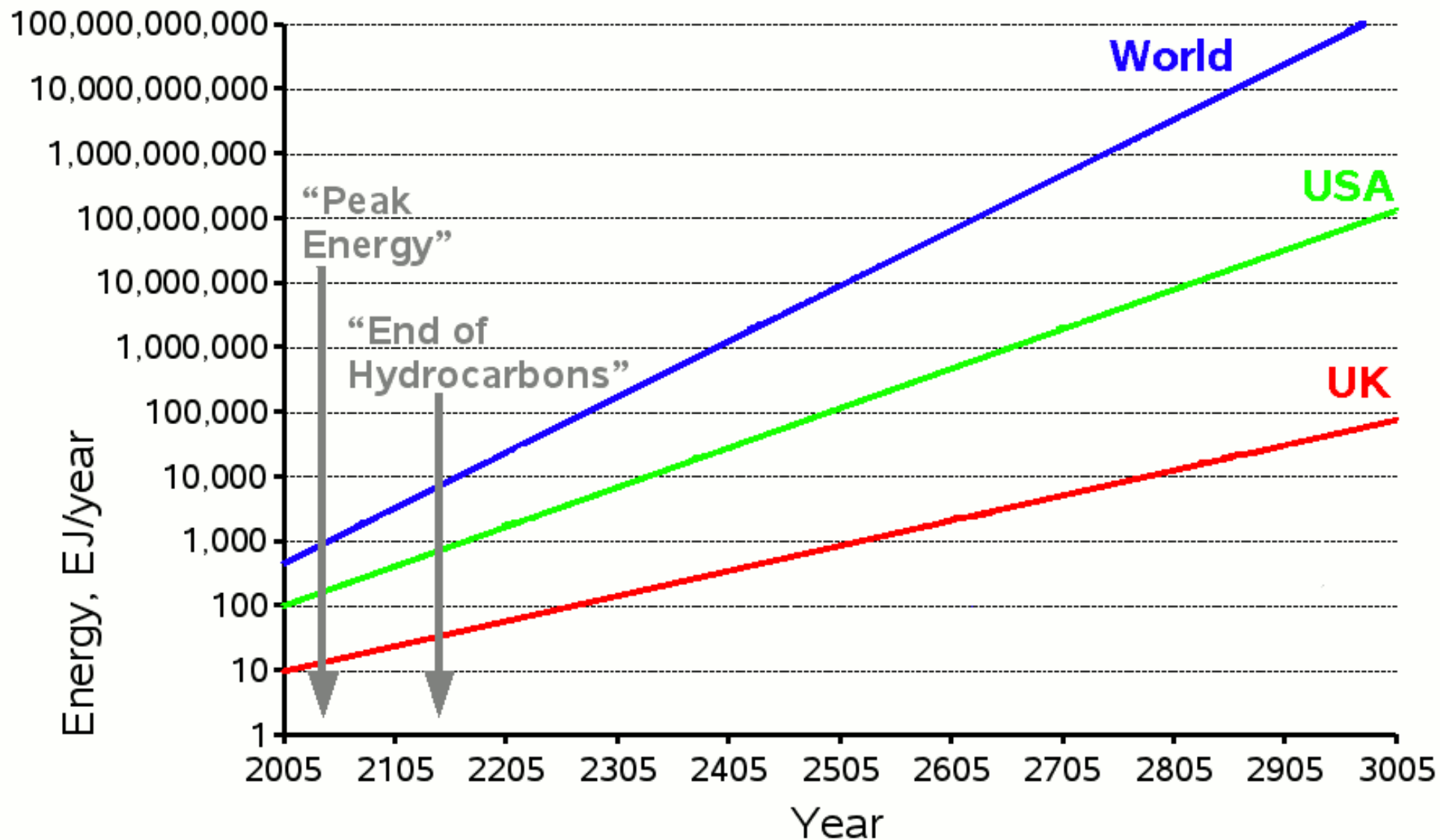
Digest of UK Energy Statistics, 2006/National Statistical Office

# The “Logical” Conclusion of Growth

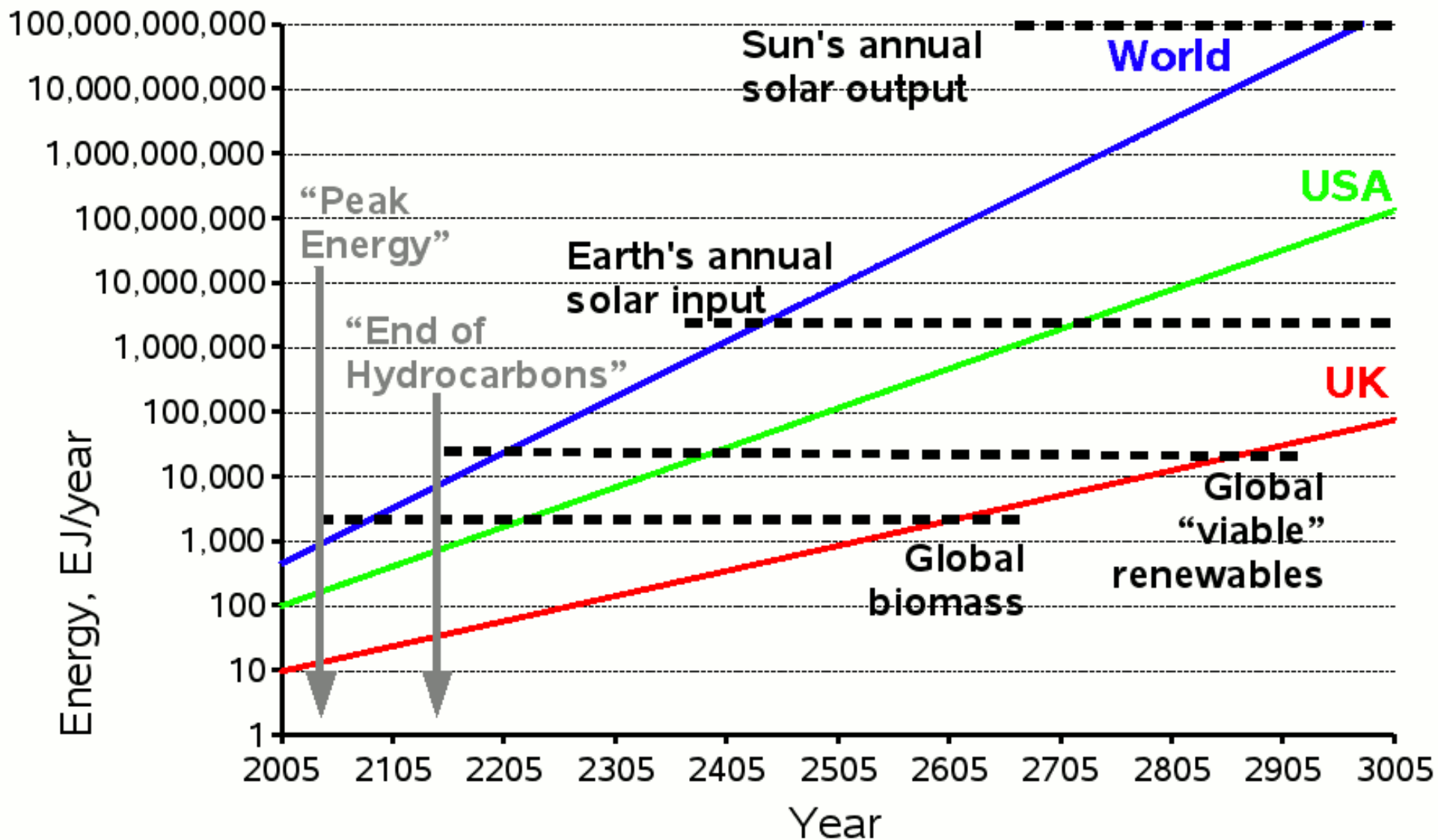




# The “Logical” Conclusion of Growth

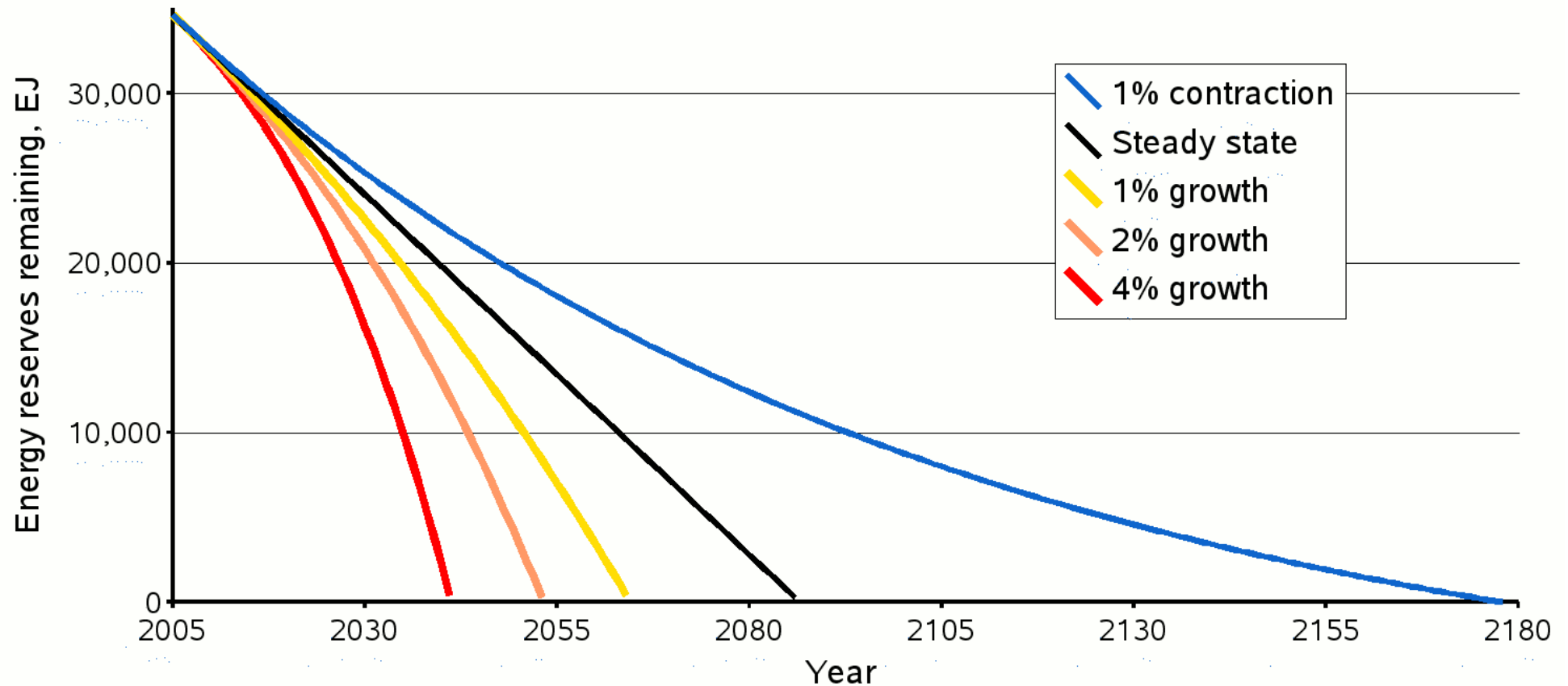


# The “Logical” Conclusion of Growth

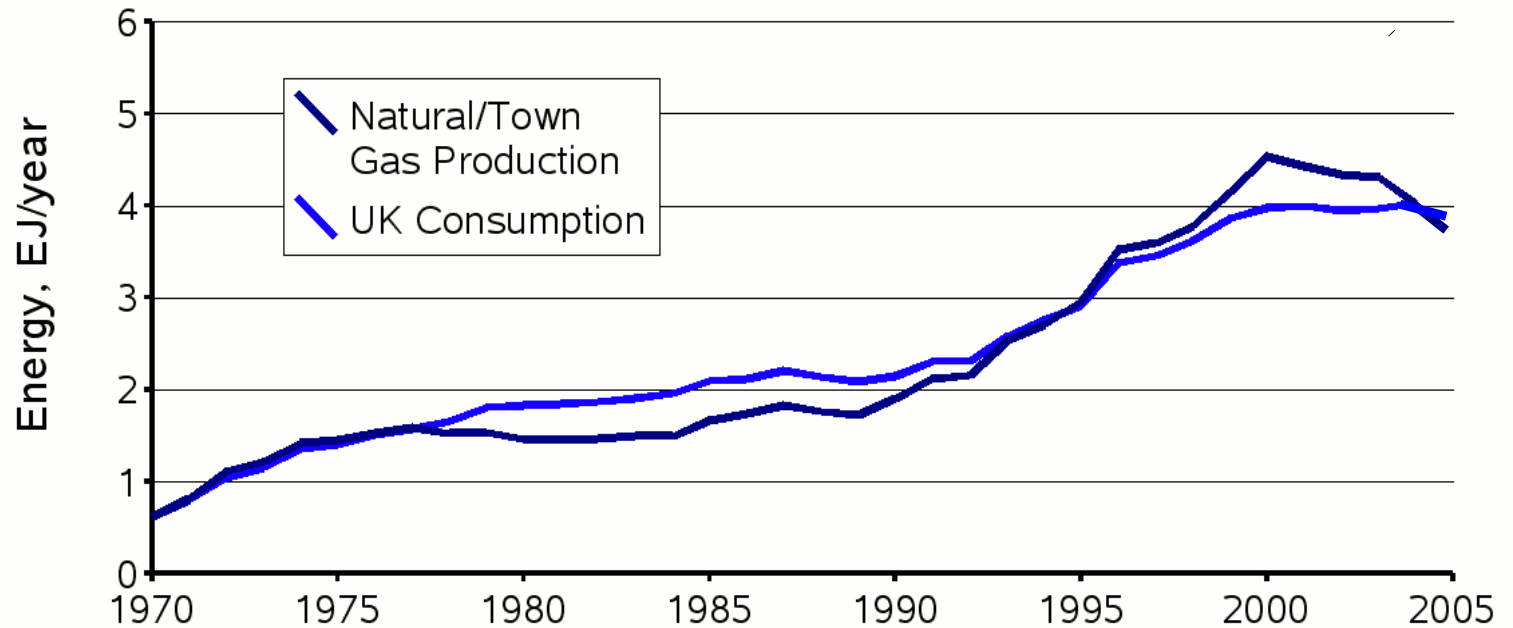
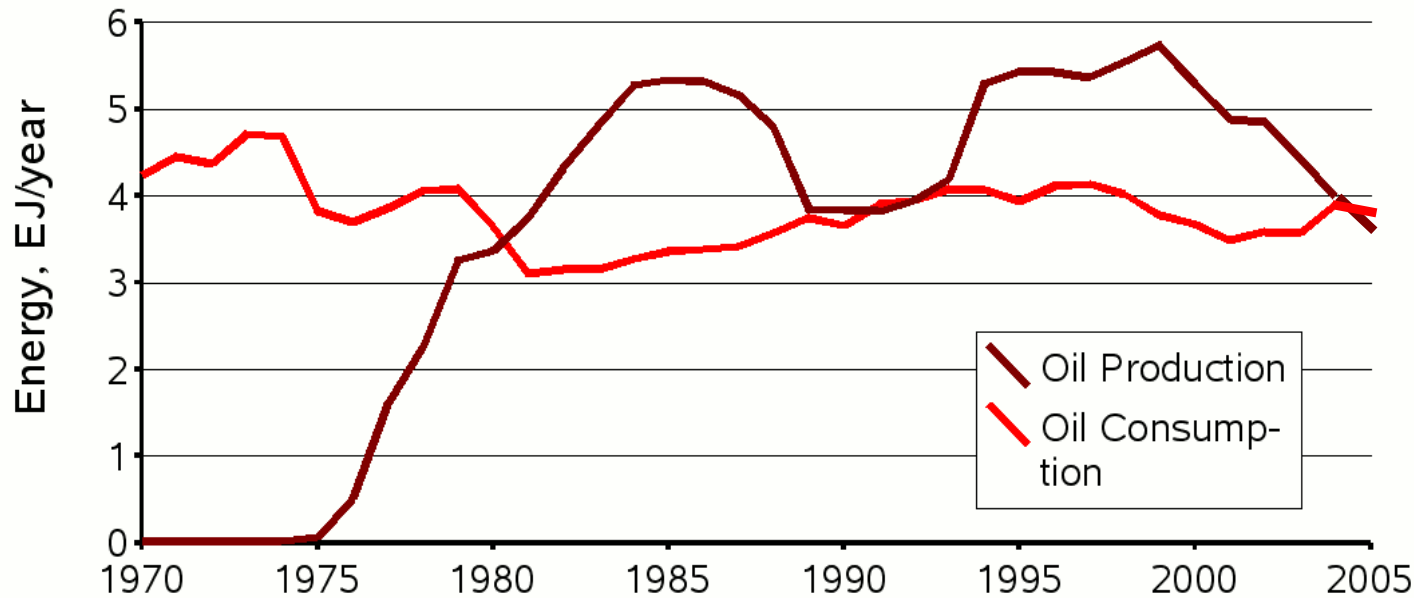


# How Long Will it All Last?

Resource	“Proven/ probable” resource	Annual consumption	Equivalent value of resource	Consumption EJ/year (2005)	R/P ratio, years
Oil (conventional)	1,201	30 billion barrels	6,856	172	40
Natural gas	179,850	2,750 billion cu. m.	6,777	104	65
Coal	909,100	5,853 million tonnes	19,370	123	158
Nuclear (uranium)	4,000	64 kilo-tonnes	1,632	26	63
Total (all resources)			34,634	424	82

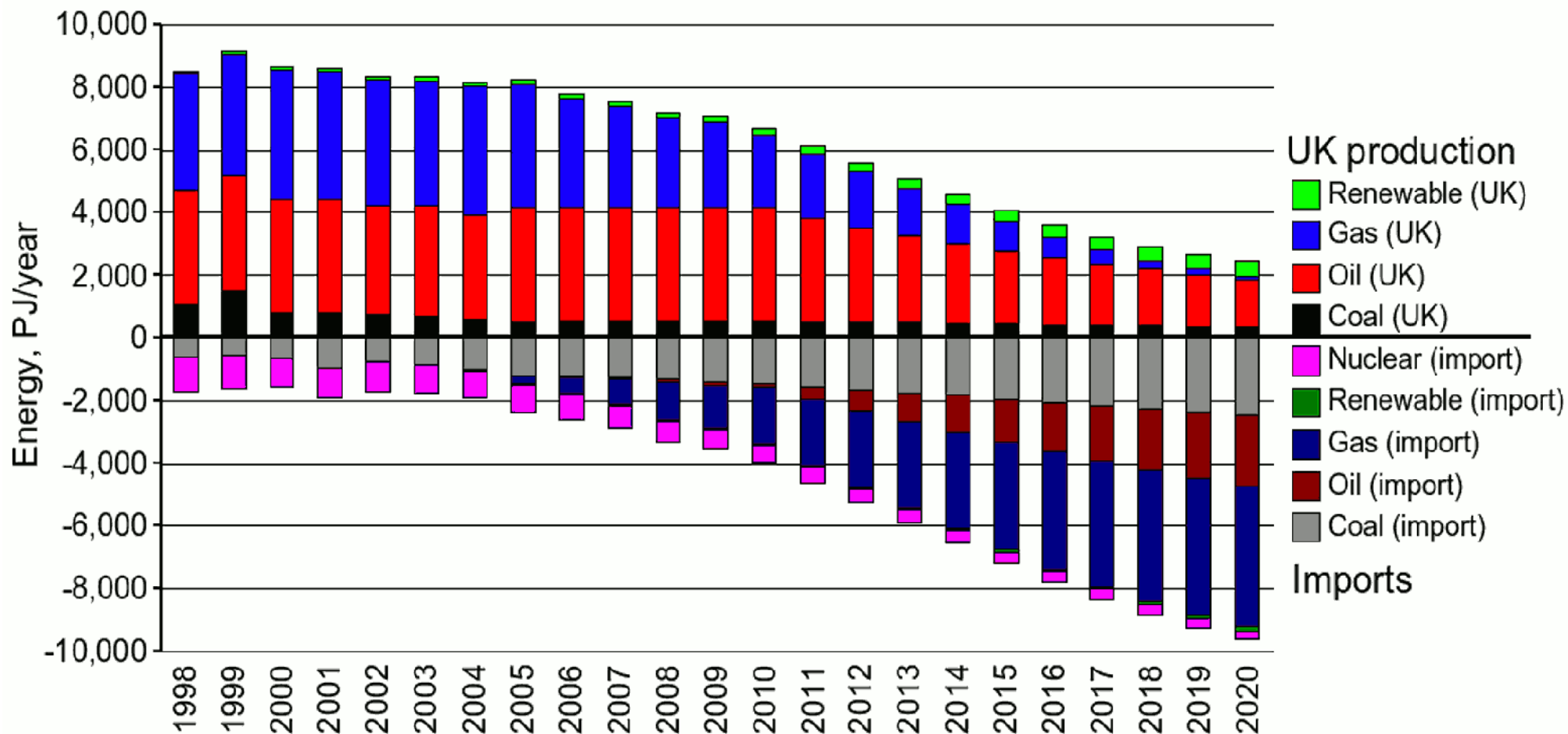


# UK Oil and Gas Production



Source:  
Digest of UK Energy  
Statistics 2005, DTI

# Change in Imports



Source:  
UK Joint Energy Security of Supply (JESS) Committee

# What's Renewable?

Wave



Wind



Hydro

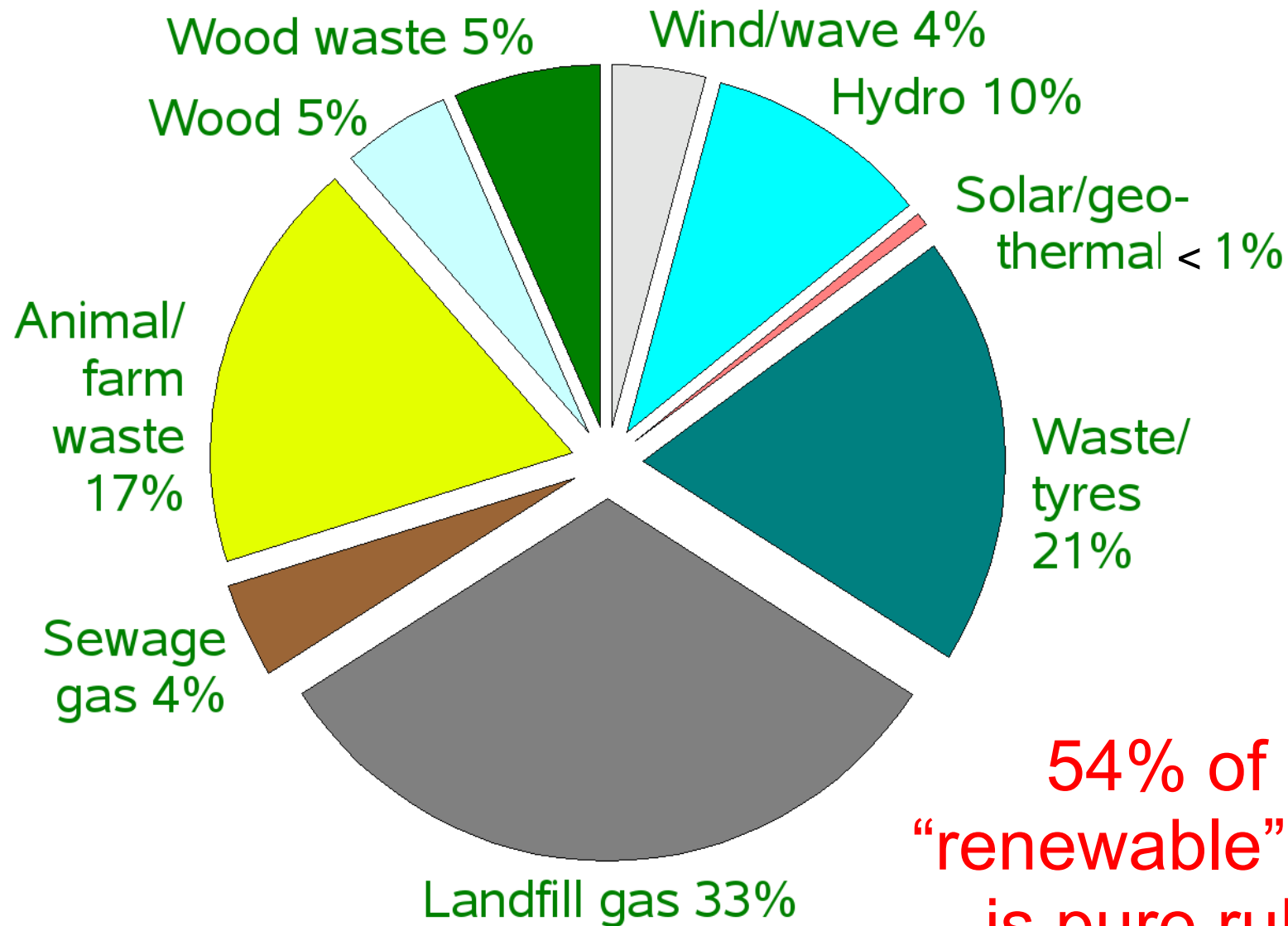


Solar PV



Thermal solar

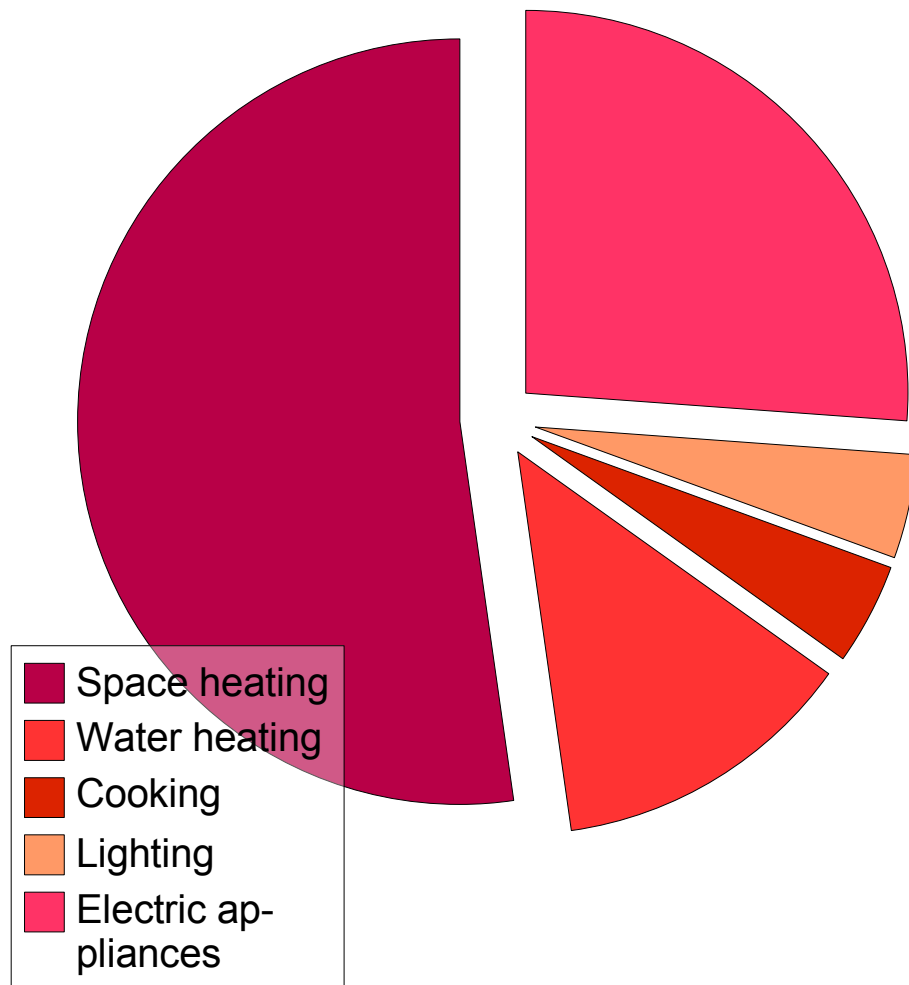
# UK “Renewable” Energy, 2005



**54% of our  
“renewable” energy  
is pure rubbish!**

Source:  
Digest of UK Energy Statistics 2006, DTI

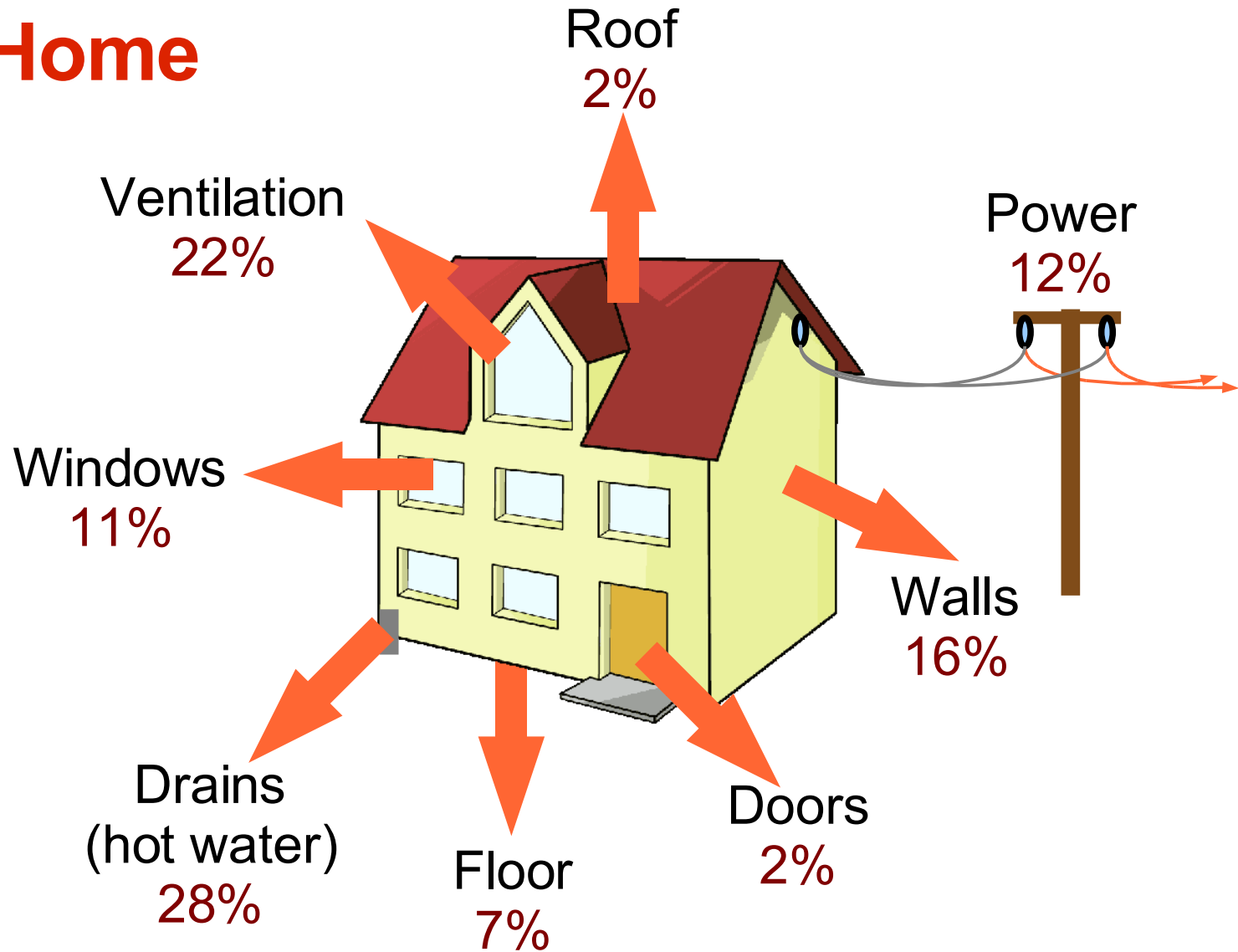
# Personal emissions: home



Total: 2.5 tonnes CO<sub>2</sub>/person/year



# Your Home

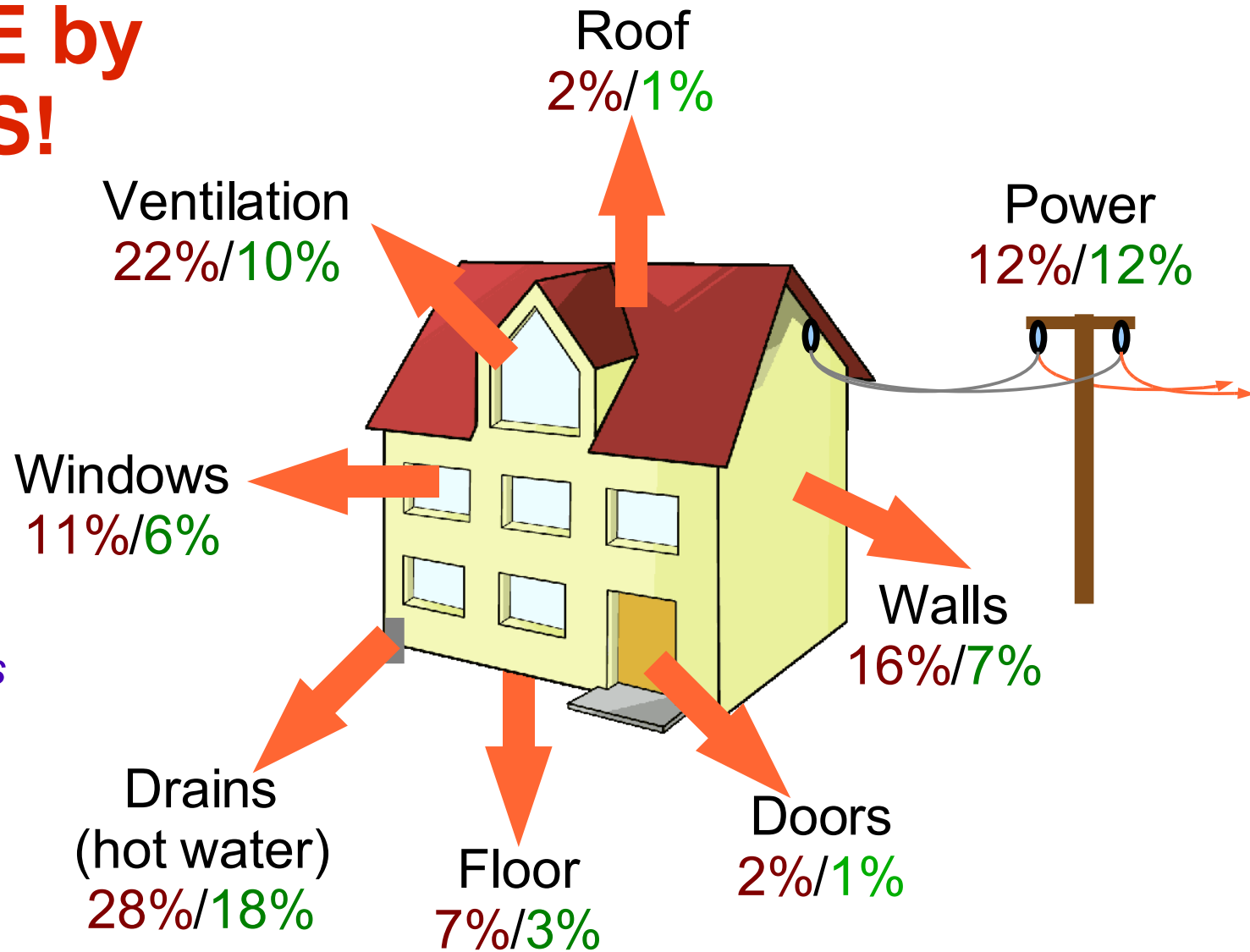


21°C av. air temp., 70°C av. water temp. – 125GJ/yr

# Save MORE by Using LESS!

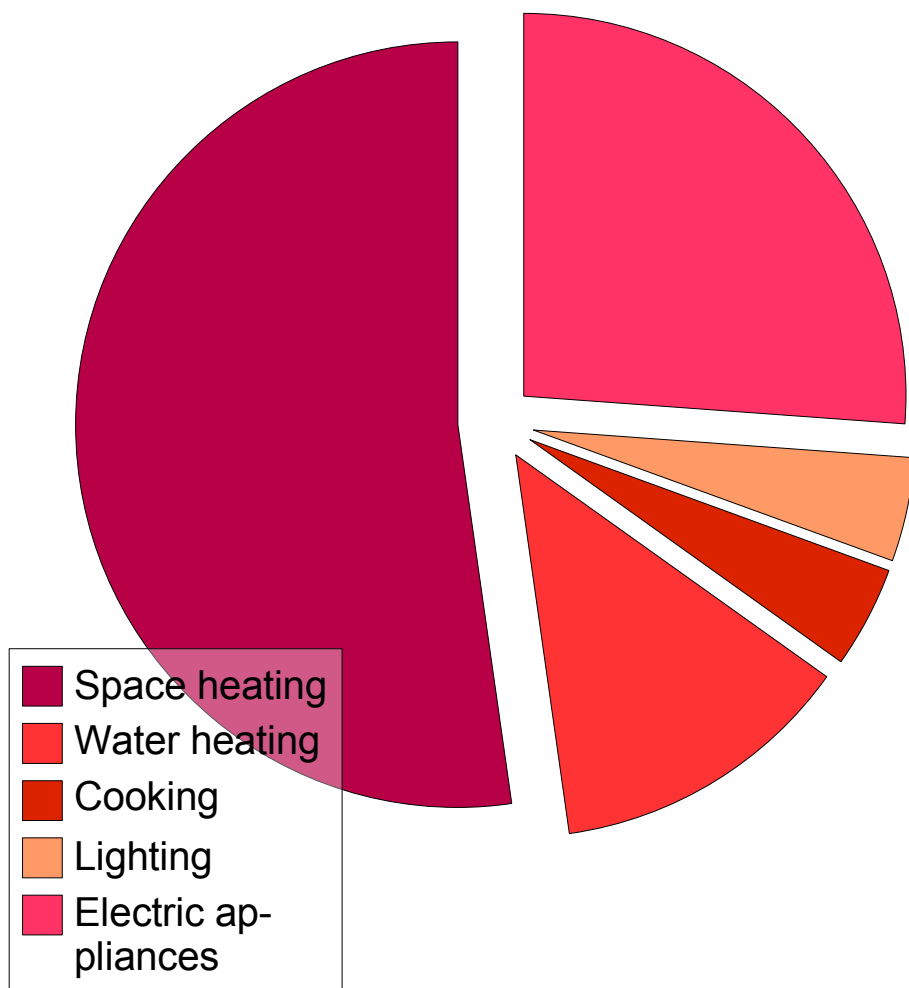
Reducing the average temp. by 1°C saves about 10% of the heating load per year!

*Note, in small houses the savings are proportionately less*



16°C av. air temp., 55°C av. water temp. – 76GJ/yr (40% less)  
[water <25%, heat <54%]

# Personal emissions: home



## Potential savings:

No standby devices, 0.07te/yr

Low energy lights, 0.09te/yr

Major insulation, 0.4te/yr

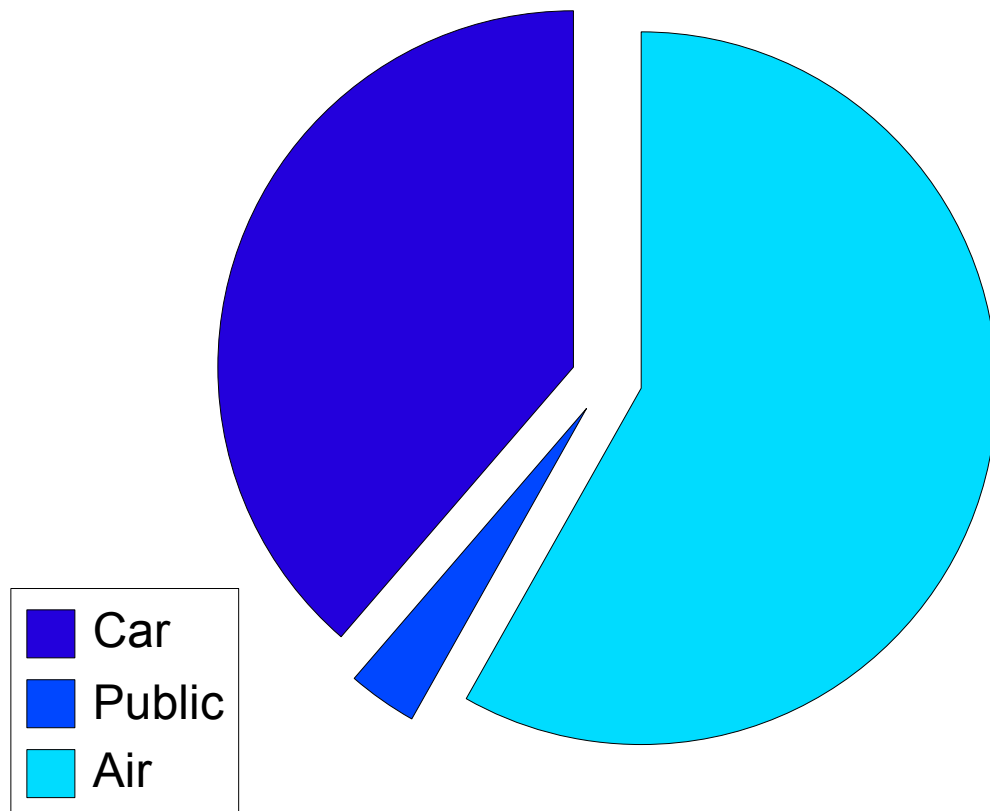
New CH boiler, 0.4te/yr

Boiler AND insulation, 0.4te/yr

Turn thermostat down, 0.7te/yr

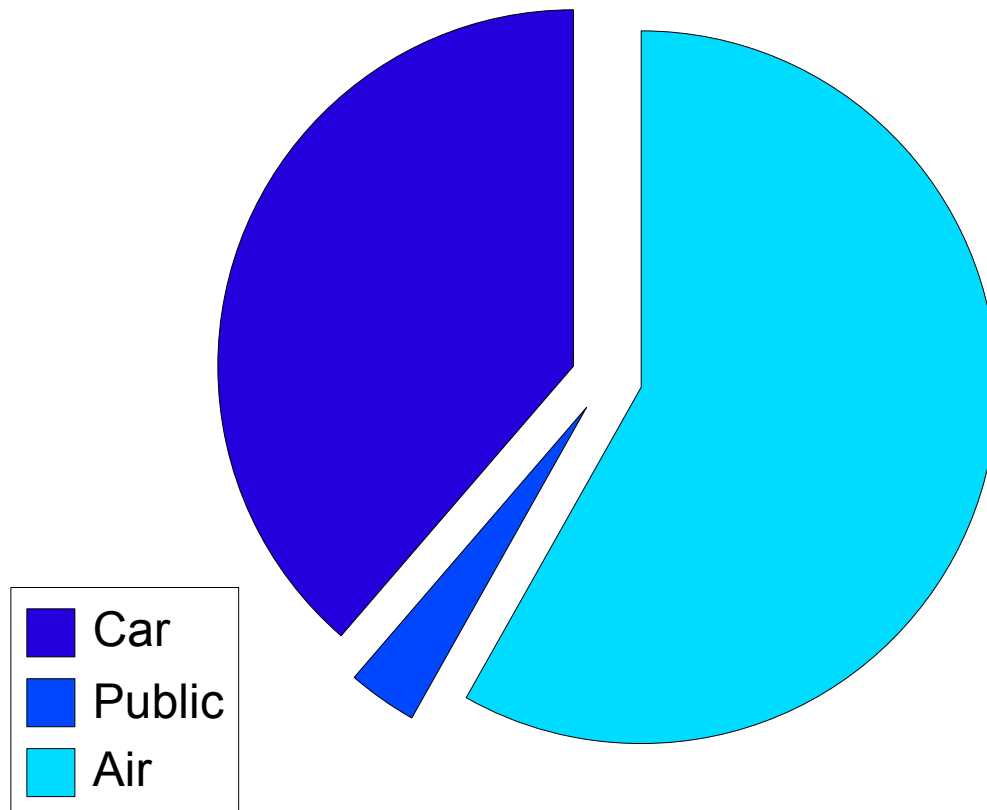
Total: 2.5 tonnes CO<sub>2</sub>/person/year

# Personal emissions: transport



Total: 3.4 tonnes CO<sub>2</sub>/person/year

# Personal emissions: transport



Potential savings:

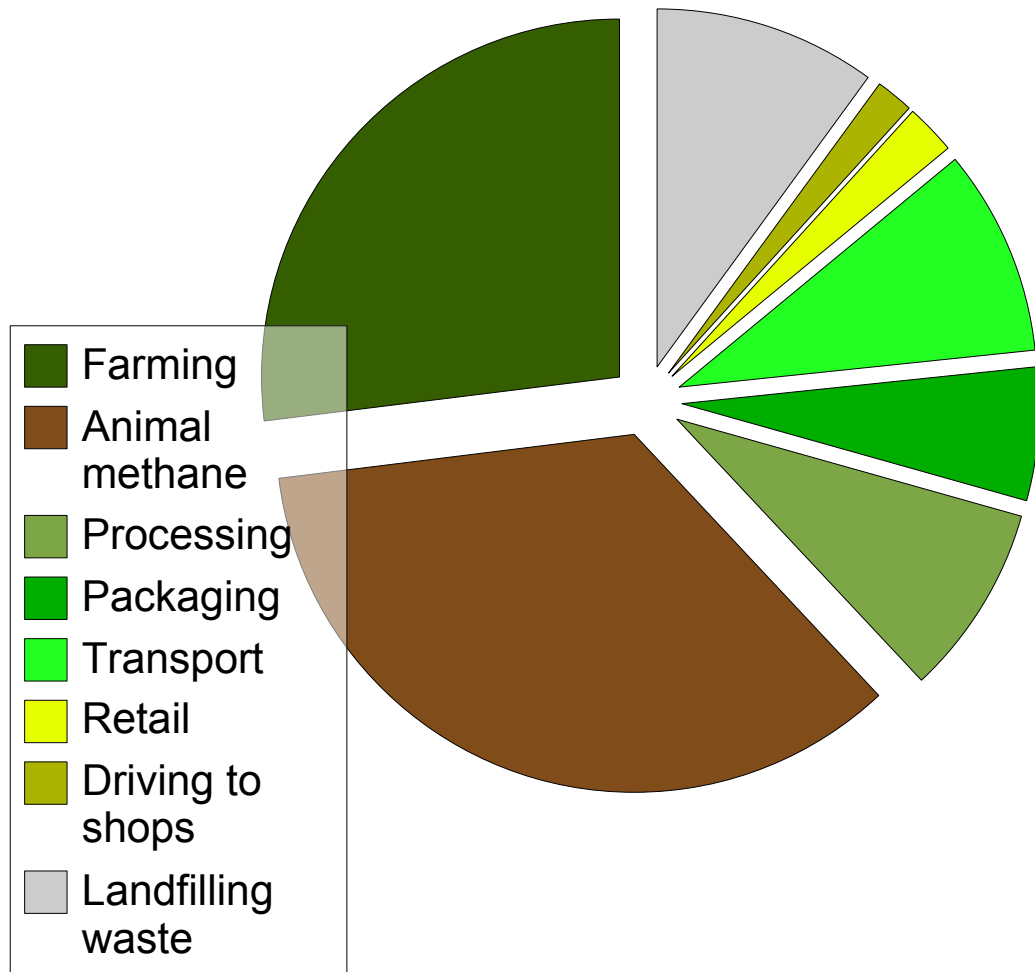
Drive a Hybrid, 0.5te/yr...  
however if everyone drove a hybrid, with current car growth emission would be back to the present level in 20 years.

Drive 60% less, 0.8te/yr....  
but if you travelled the same distance by public transport the next effect is about 0.3te/yr.

90% less air travel, 1.8te/yr

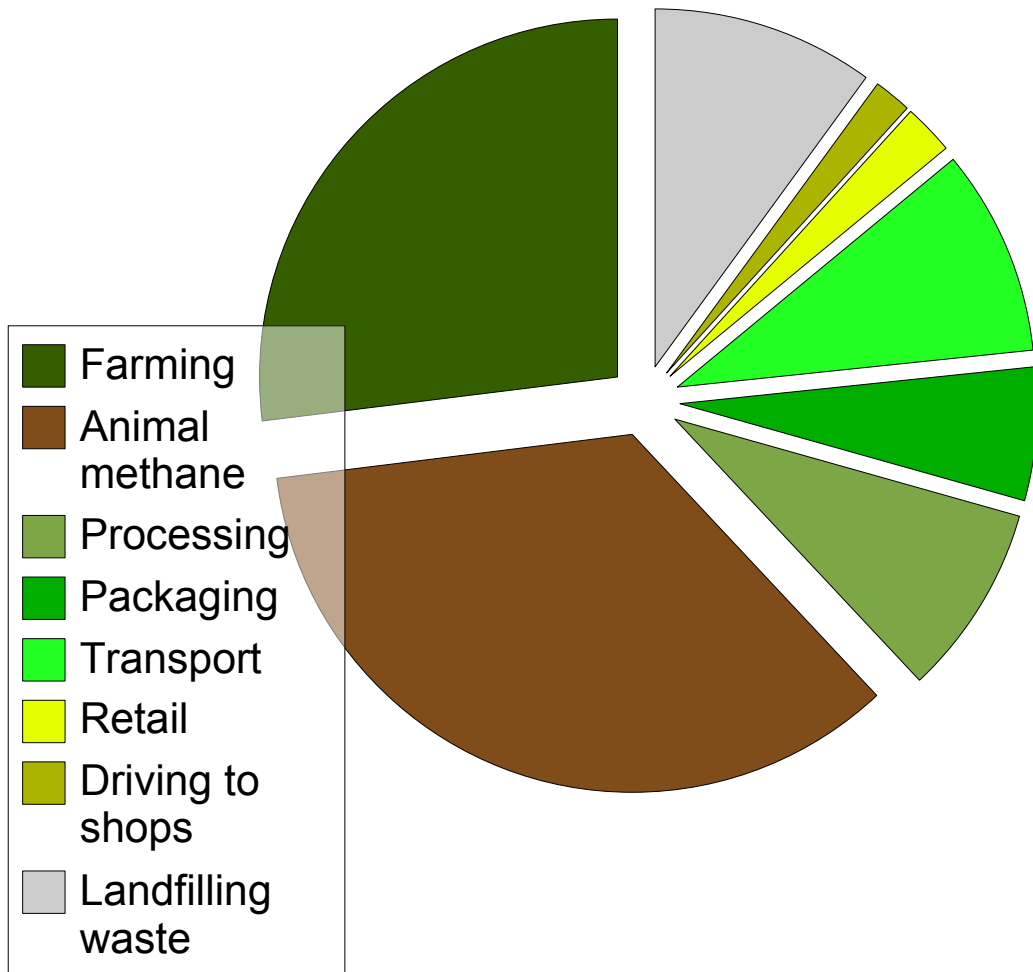
Total: 3.4 tonnes CO<sub>2</sub>/person/year

# Personal emissions: food



Total: 2.9 tonnes CO<sub>2</sub>/person/year

# Personal emissions: food



## Potential savings:

Drive 50% less to shop, 0.03te/yr

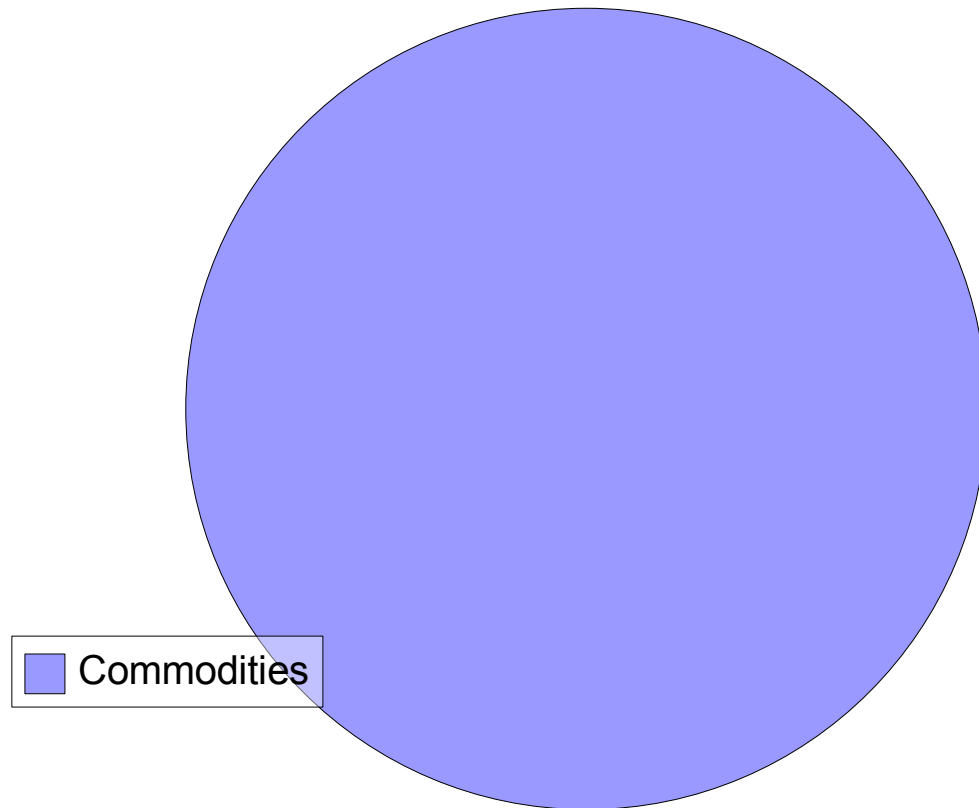
Improves farm practices, 0.12te/yr

Greater food chain localisation/  
eco-efficiency, 0.45te/yr

90% less meat eating, 0.9te/yr...  
but the net effect of additional  
food growing the net saving is  
0.6te/yr.

Total: 2.9 tonnes CO2/person/year

# Personal emissions: commodities



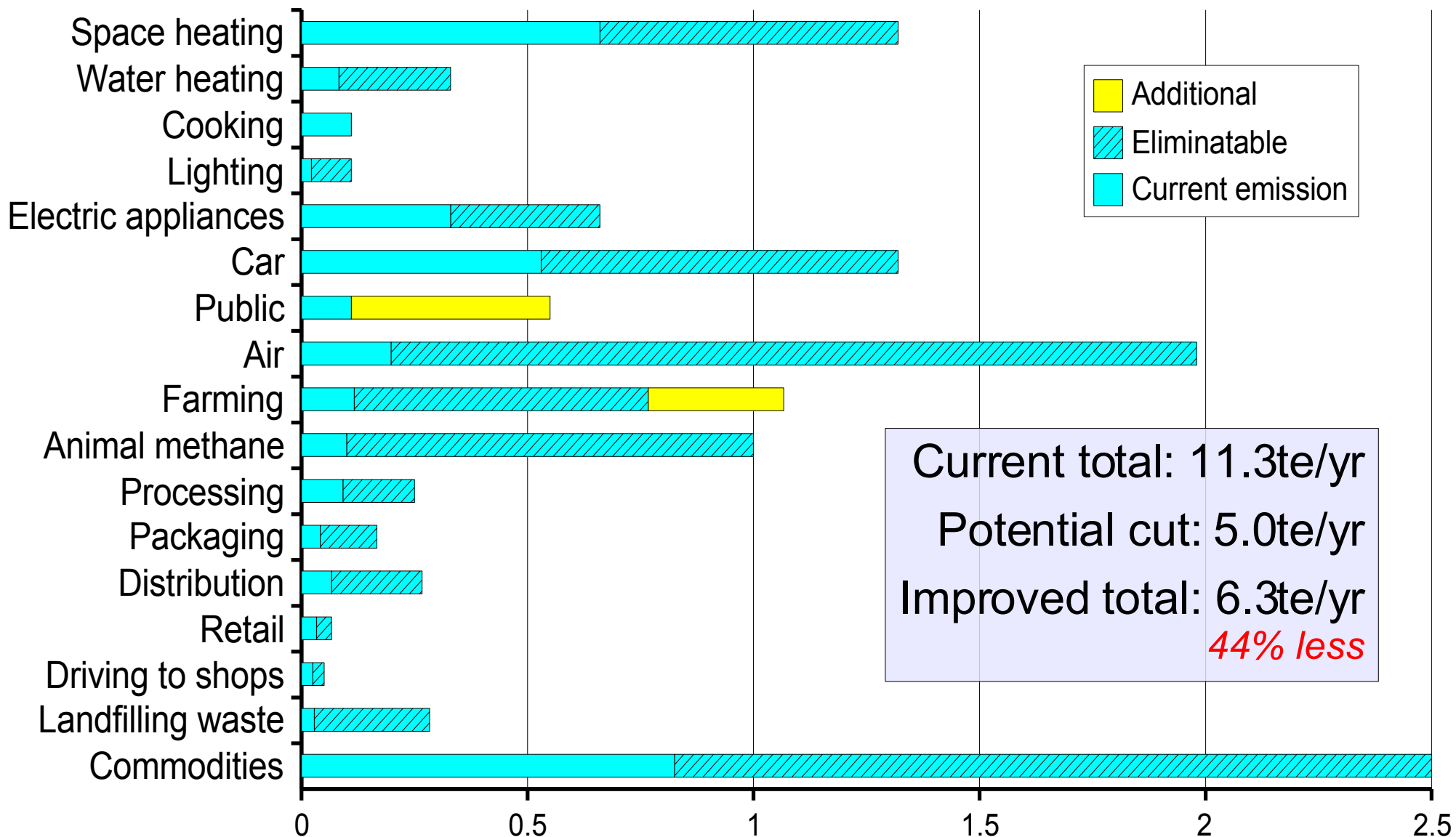
Potential savings:

Make your stuff last 3 times longer, save 1.7te/yr

Total: 2.5 tonnes CO2/person/year



# Putting it all together



# The immediate priority: POWERDOWN

## Network

You're going to need help! That begins by re-establishing social networks.



## Skills

Reducing external energy means that you must put more in yourself – this requires that you re-learn the skills we've lost to the consumer society.

## Consume less

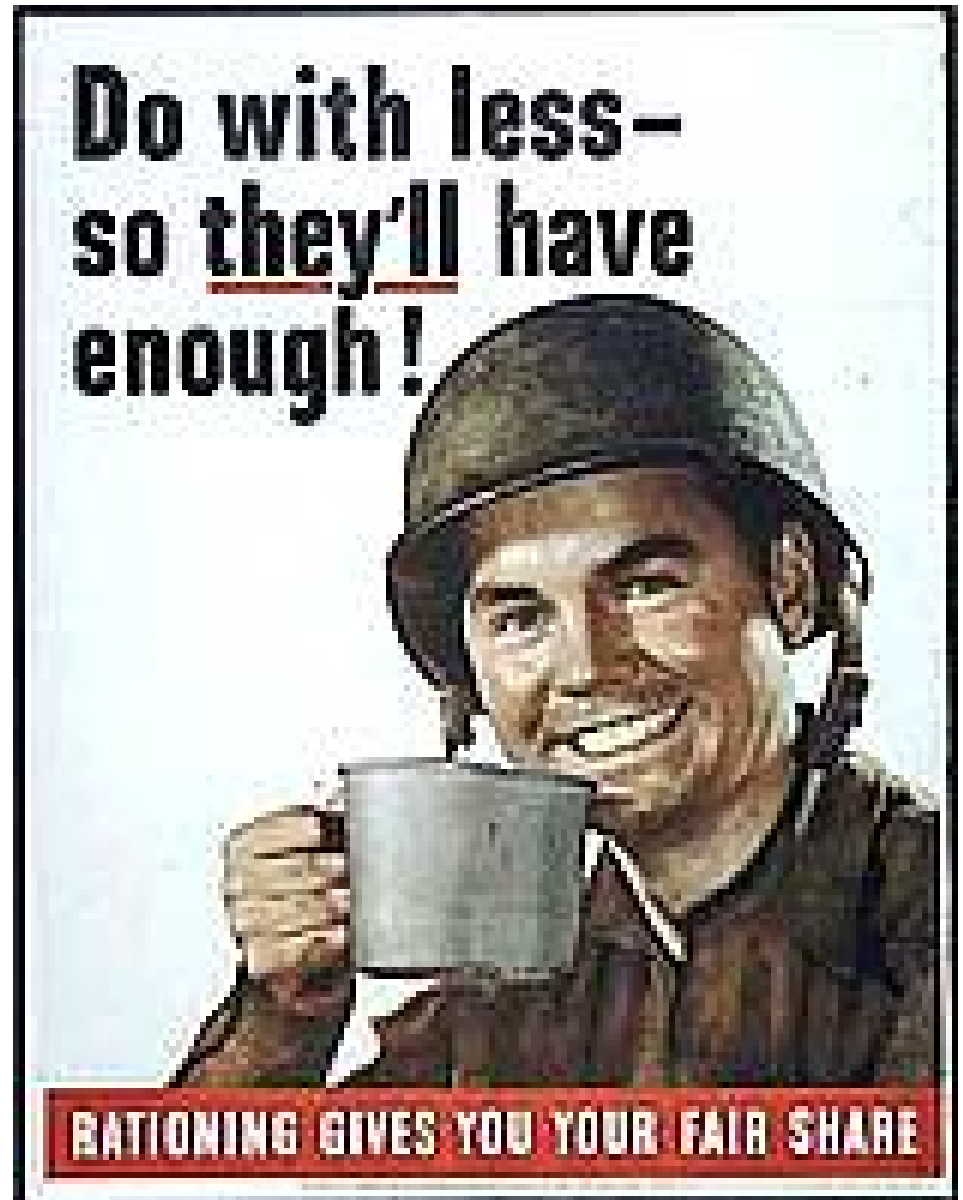
If you wait to Powerdown is unavoidable you're going to be a unhappy person – don't wait, start today.

## Acclimatise

Turn your thermostats down now and put your jumpers on! (seriously, doing more yourself will make you physically fitter, but it takes time)

**When is do carbon  
emissions reach  
crisis levels?**

**...when rationing starts!**



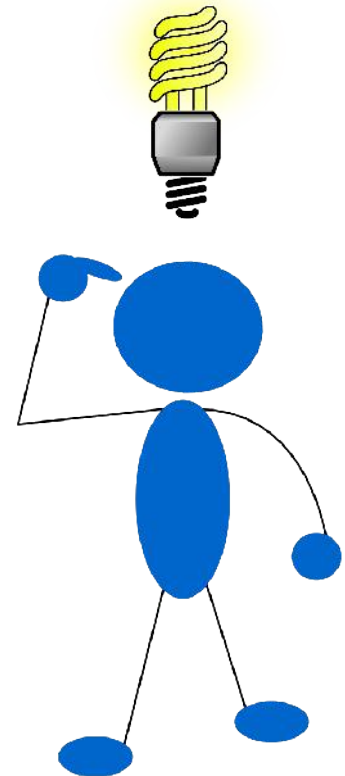
The Free Range  
“Energy Beyond Oil” Project

web: <http://www.fraw.org.uk/ebo/>

email: [ebo@fraw.org.uk](mailto:ebo@fraw.org.uk)



...but, if you can think of a better idea, we'd like to hear it!



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