

Peak Oil & Economic Growth

APPGOPO

2/23/2009

By Chris Martenson

The Three “E”s



**THE NEXT 20 YEARS ARE
GOING TO BE
COMPLETELY UNLIKE THE
LAST TWENTY YEARS**

How Economists See the World

$$(x + a)^n = \sum_{k=0}^n \binom{n}{k} x^k a^{n-k} \rightarrow \text{GROWTH}$$

MONEY



**All Money
is Loaned
into
Existence**

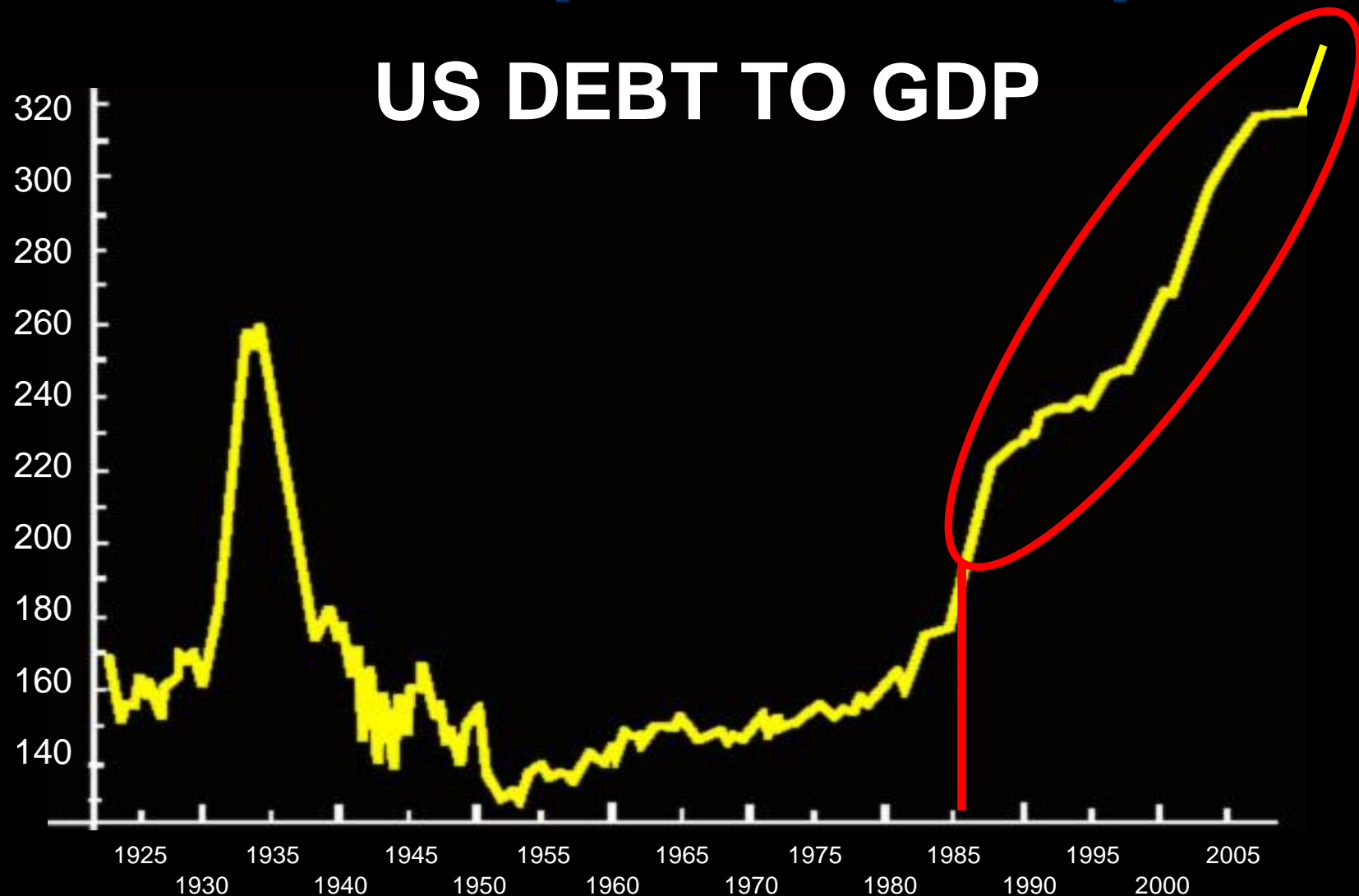
Key Concept

All money is loaned
into existence.

Key Concept

Perpetual growth is a
requirement
of modern banking.

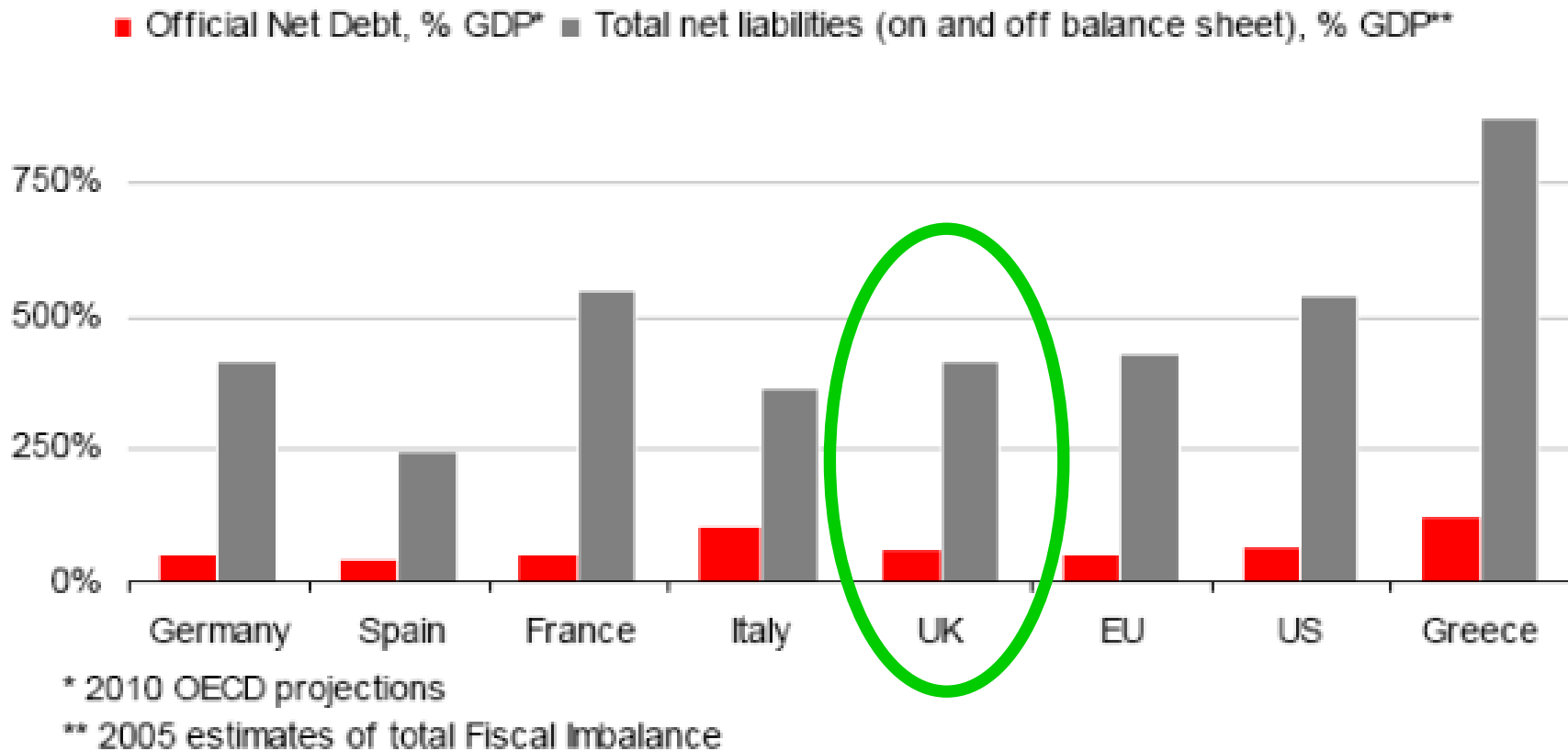
What's the implicit assumption?



Source: Ned Davis Research <http://www.safehaven.com/article-5995.htm>

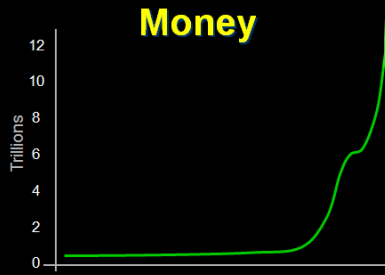
A Global Phenomenon...

Our governments are insolvent: what's off-balance sheet dwarfs what's on ...



Source: SG Cross Asset Research; Jagadeesh Gokhale (2009); OECD

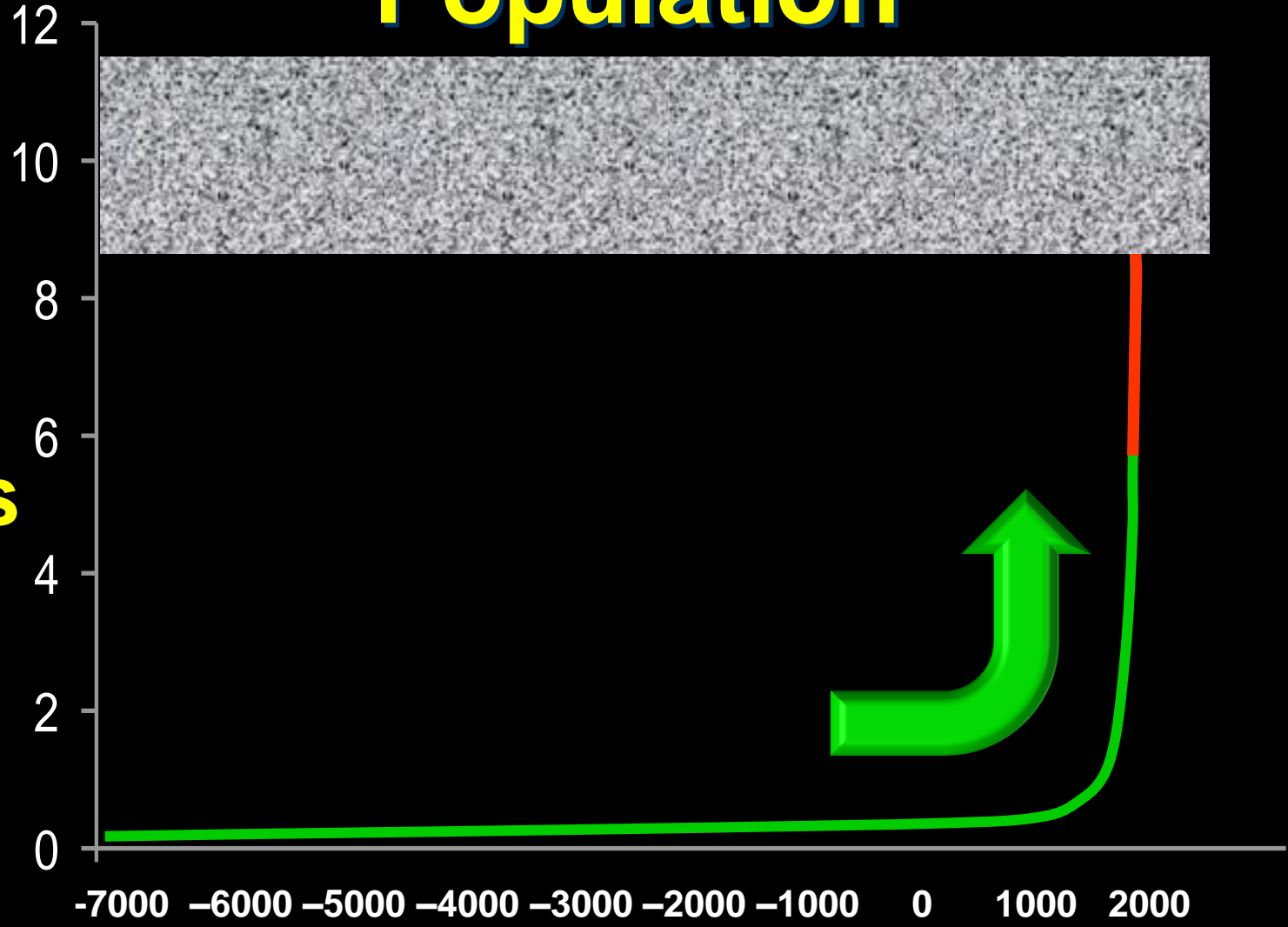
Must Grow



Exponential Growth

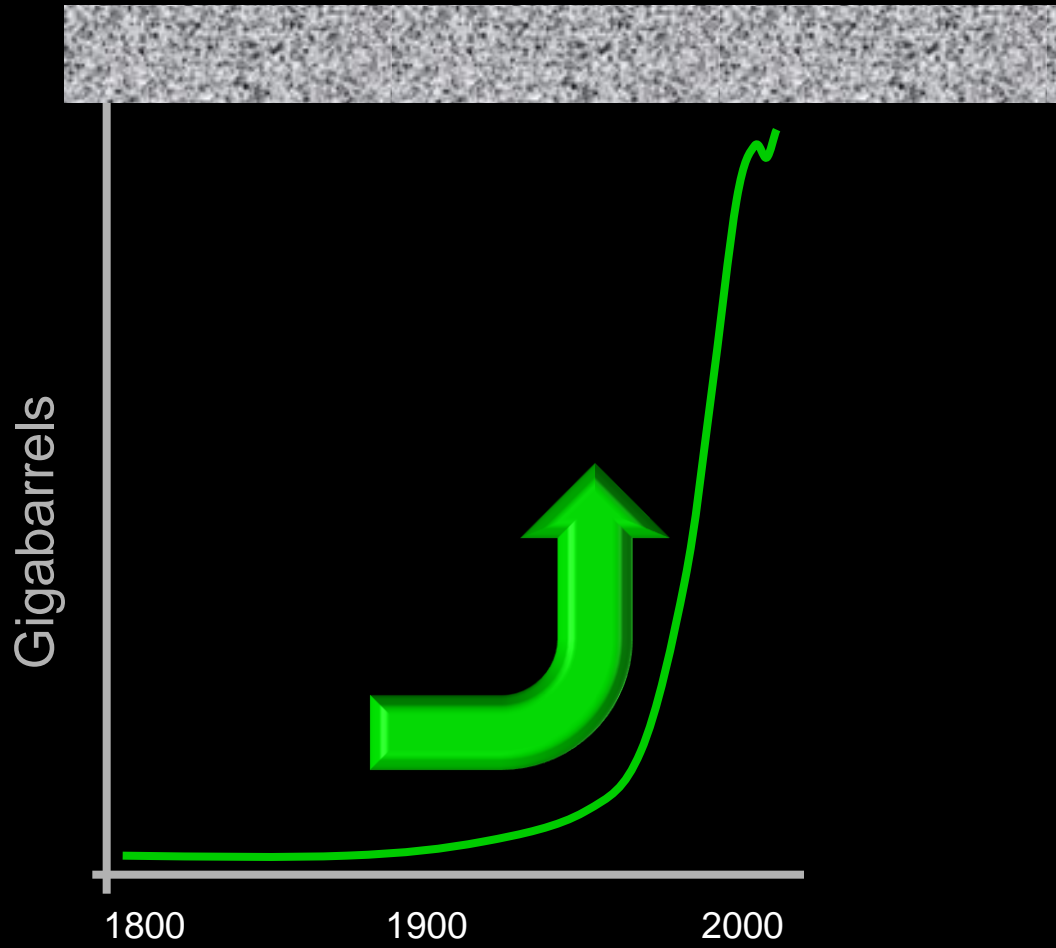
Population

Billions



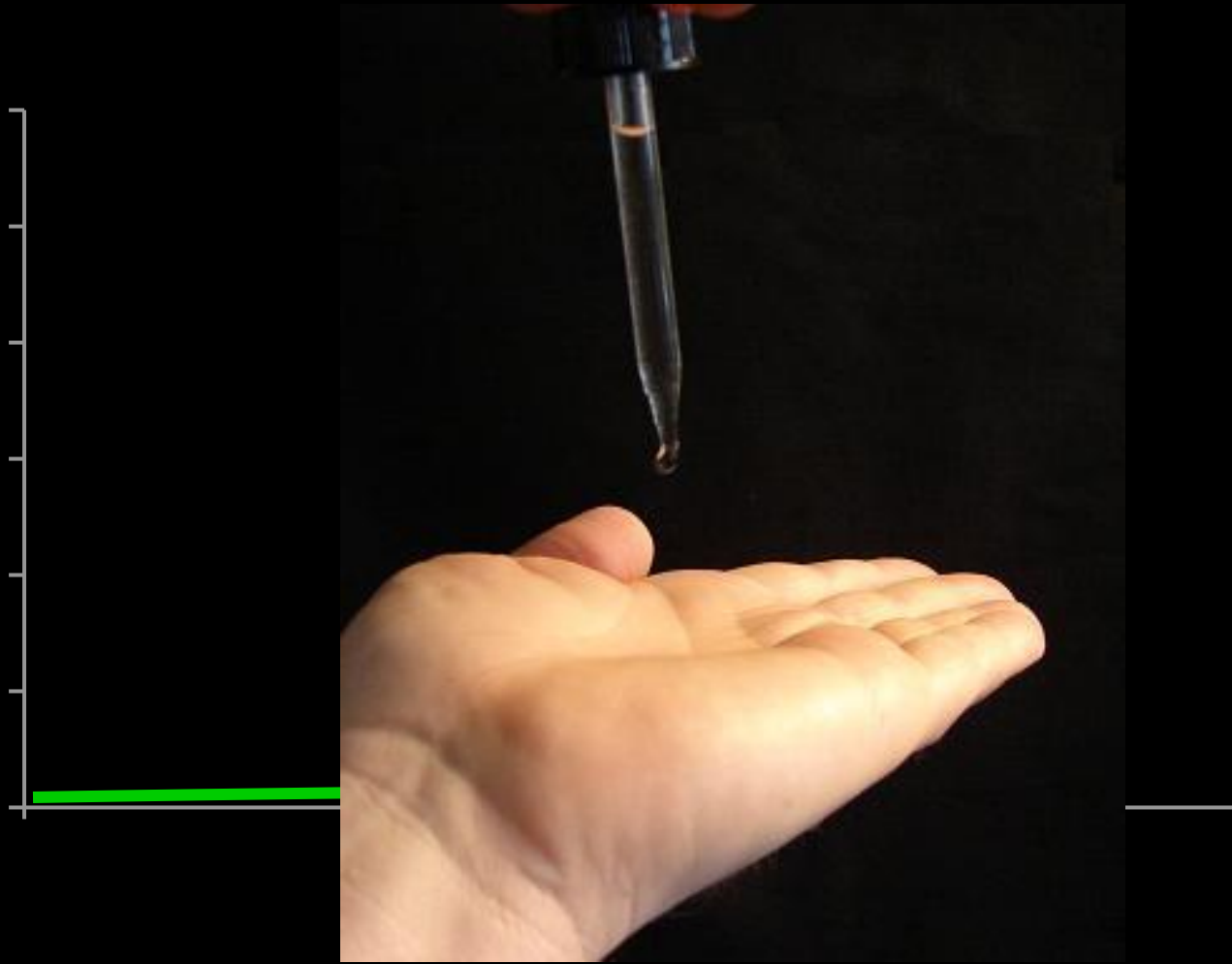
Years

Oil



Compounding

The Power of Compounding



Wembley Stadium



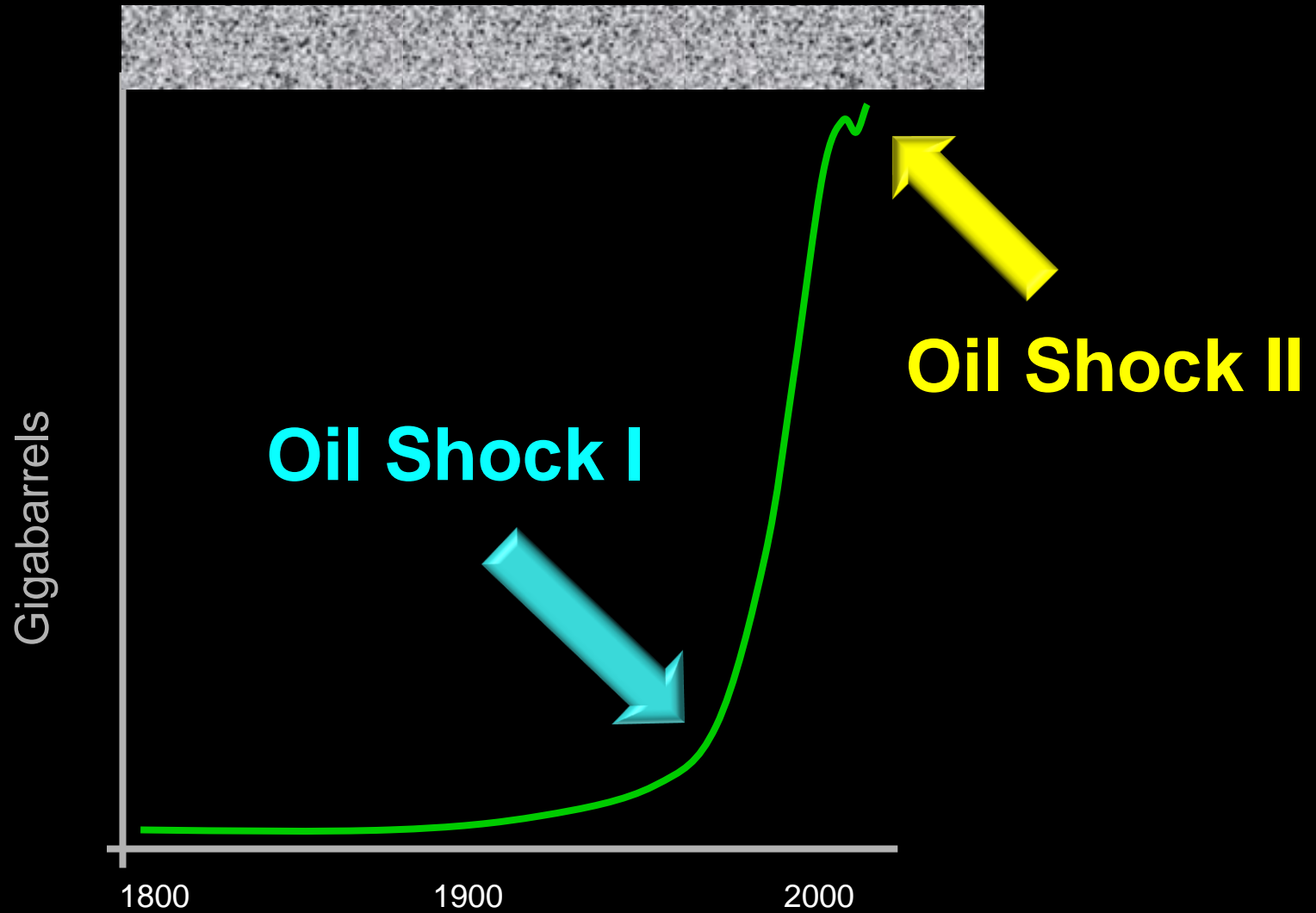
**If we began at 12:00, when would
Wembley Stadium be filled?**

12:50

**At what time would it still be
97% empty?**

12:45

Oil Consumption



Gigabarrels

Oil Shock I

Oil Shock II

1800

1900

2000

Key Concepts

**Exponential charts are
everywhere.**

Economy. Energy. Environment.

Speeding up!

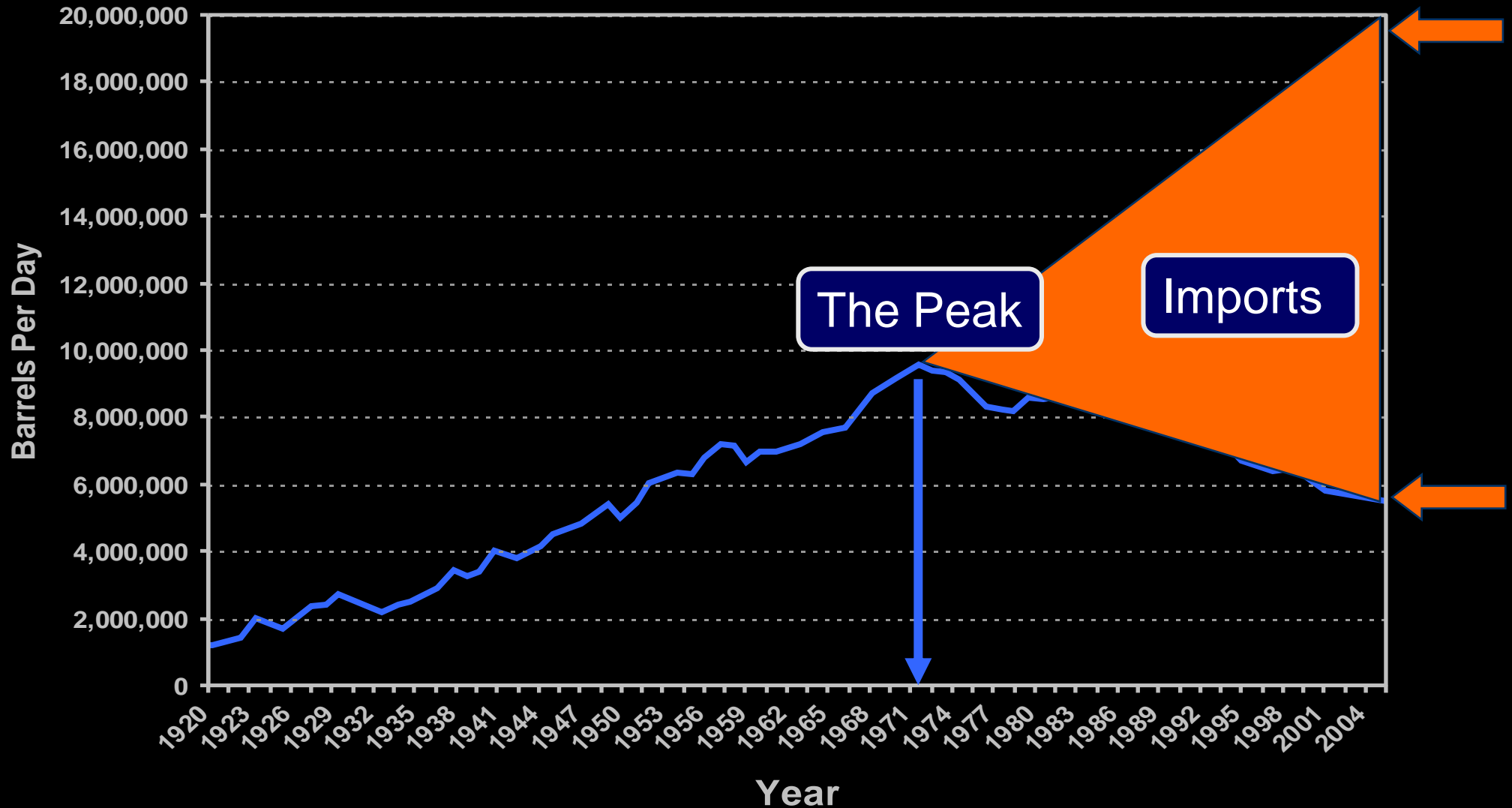
PROBLEMS
VS.
PREDICAMENTS



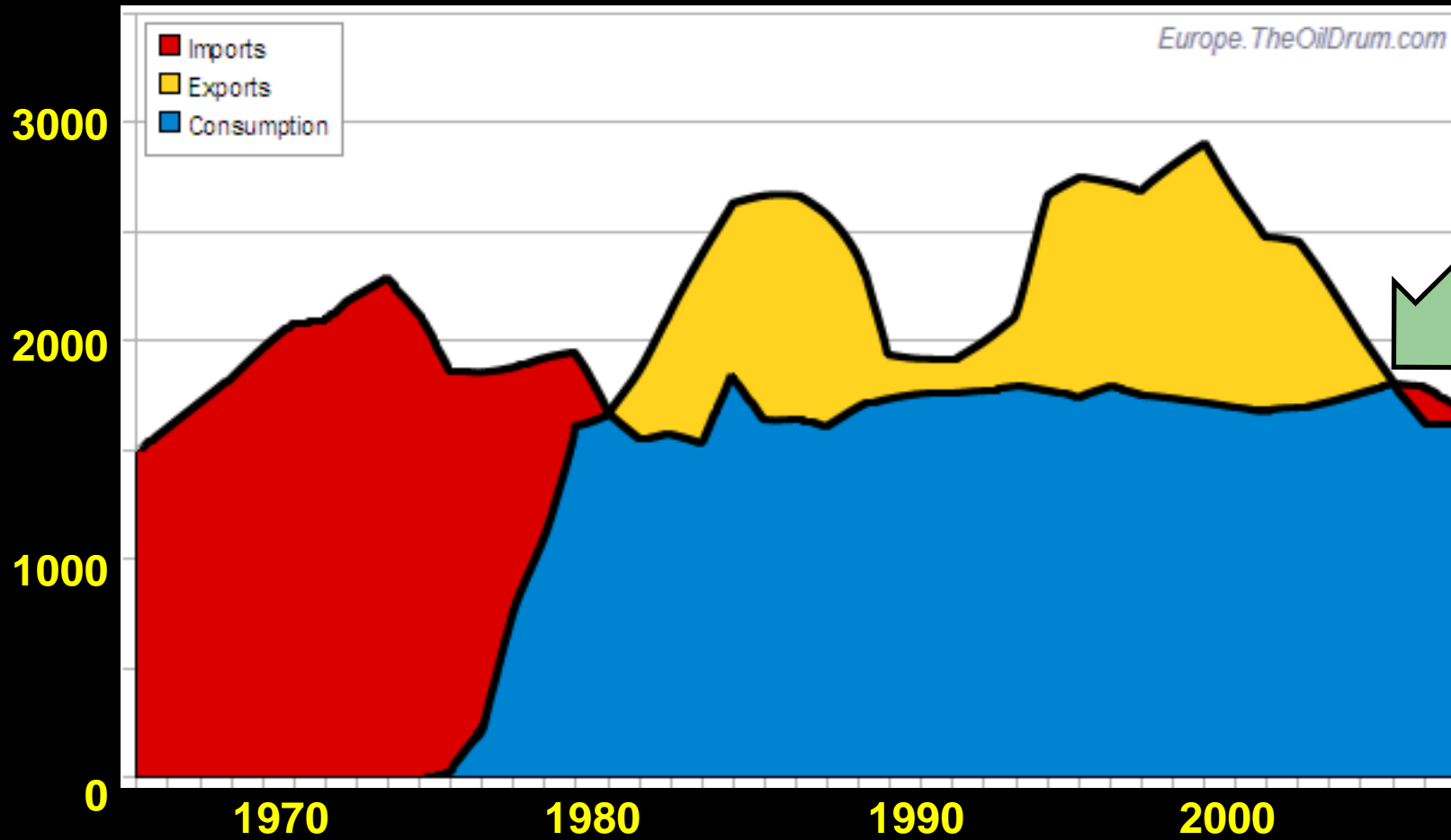
ENERGY

ENERGY

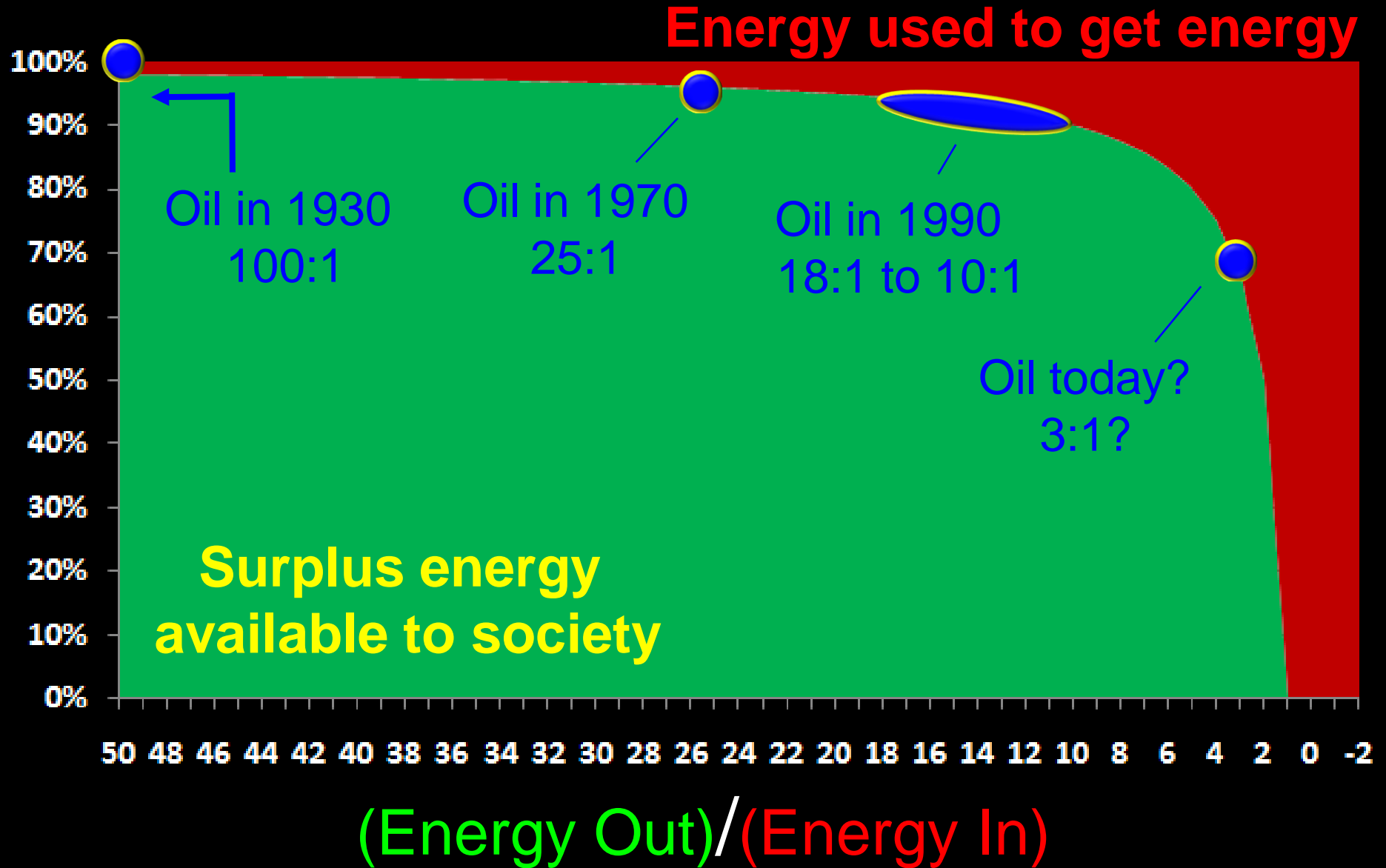
US Oil Production & Dependency



UK Turned Import-Dependent in 2005

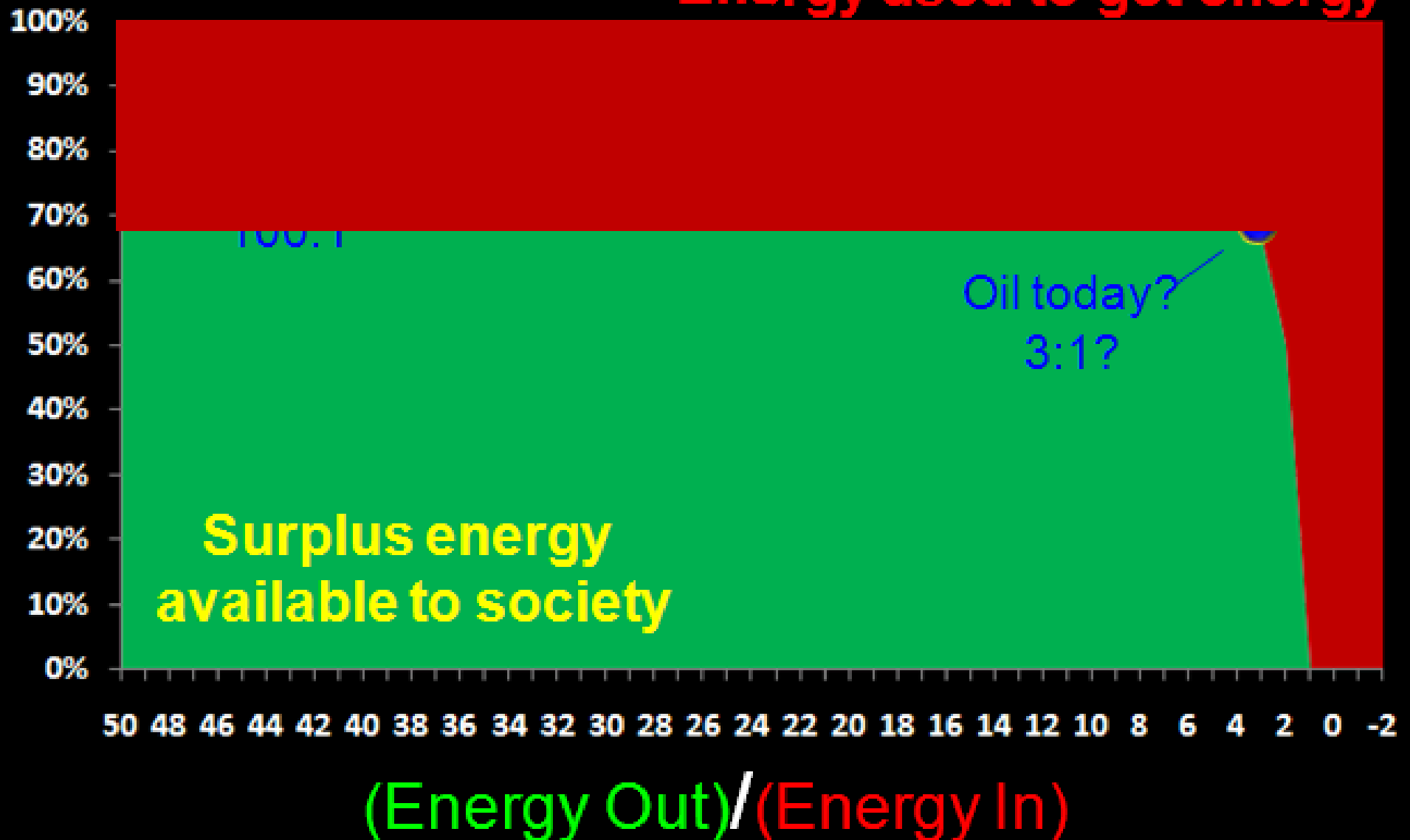


The Energy Cliff - Oil

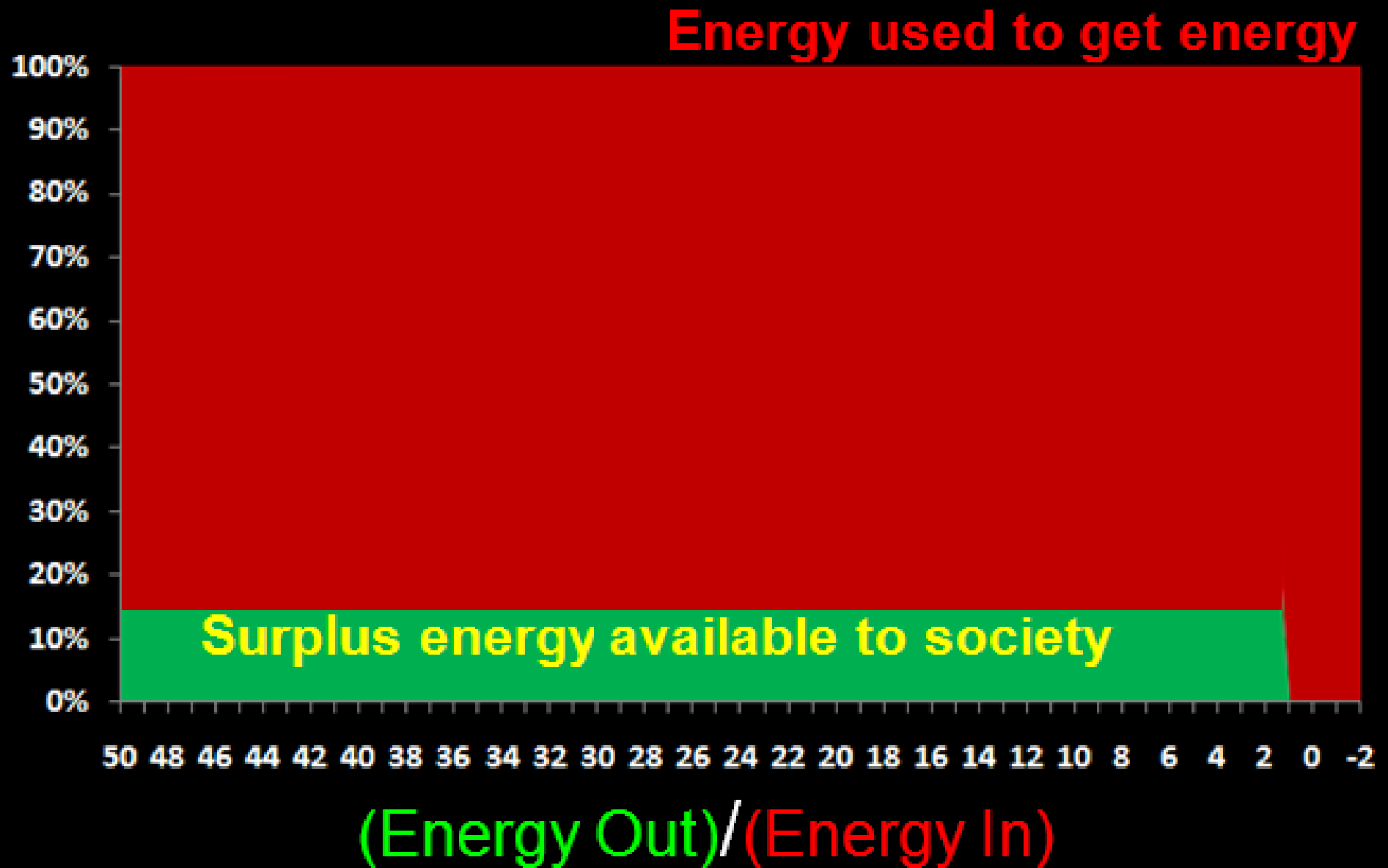


The Reality...

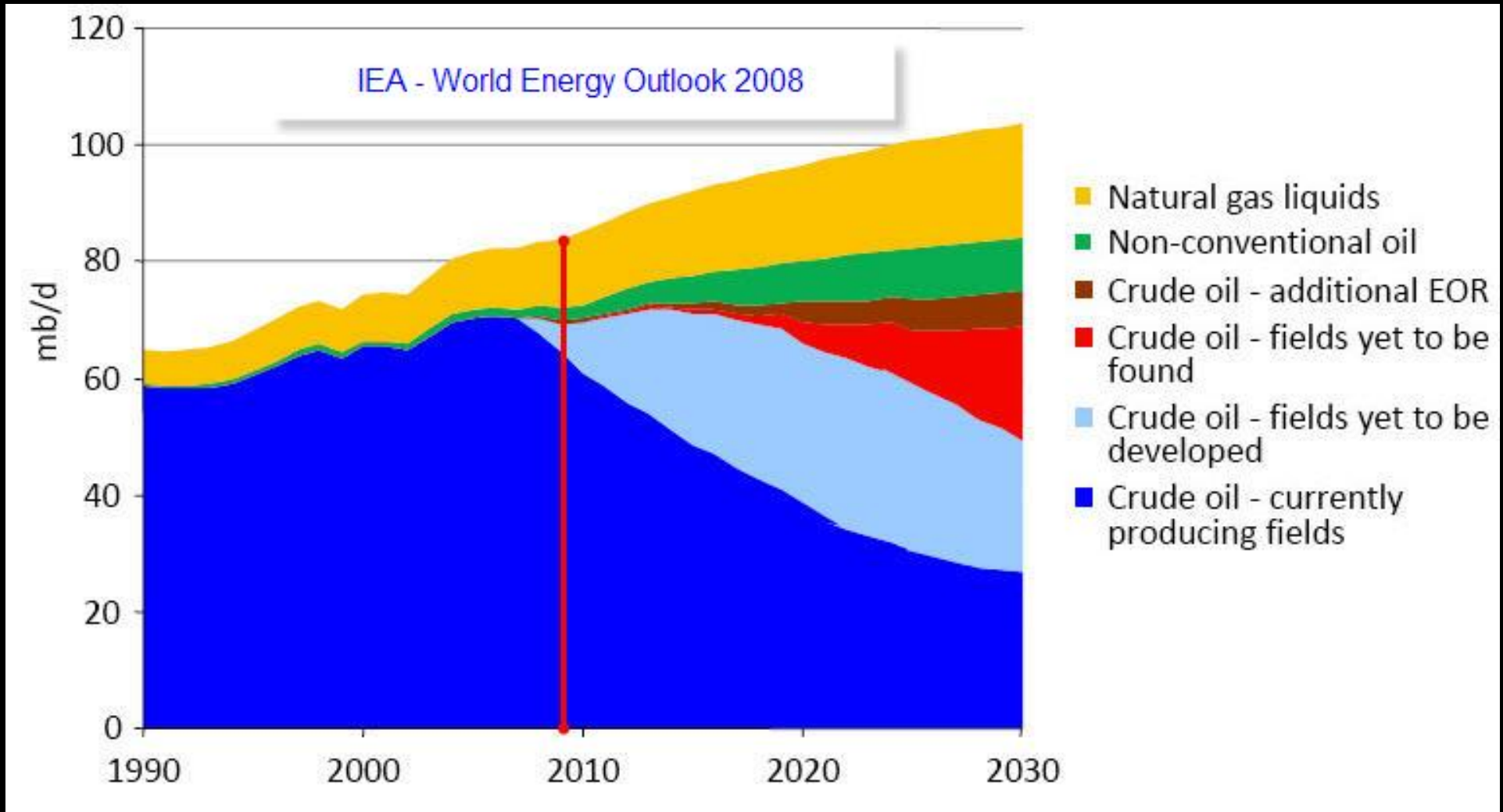
Energy used to get energy



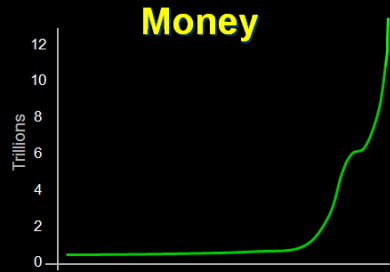
The Worry...



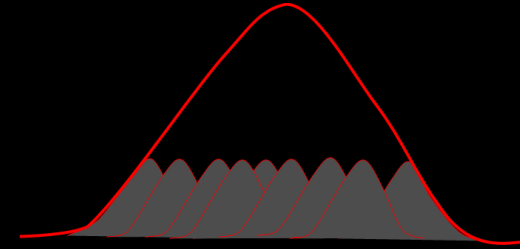
Oil – Past (conventional) Peak Already



Must Grow



Can't Grow



Quantity & Quality;
equally important!



ENVIRONMENT



Copper Ore – 10%

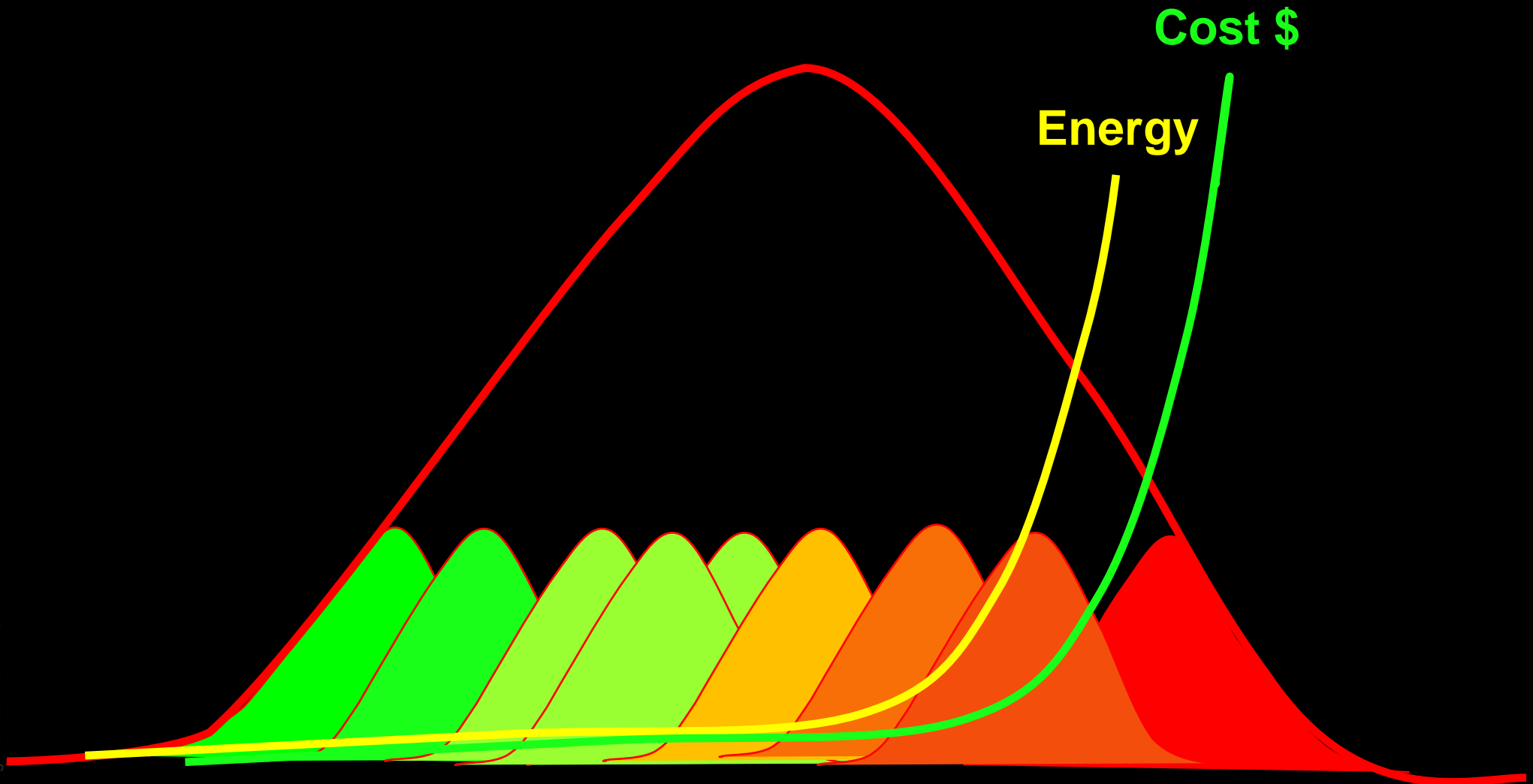


Copper Nugget

Copper Mining - Bingham Canyon Mine, Utah

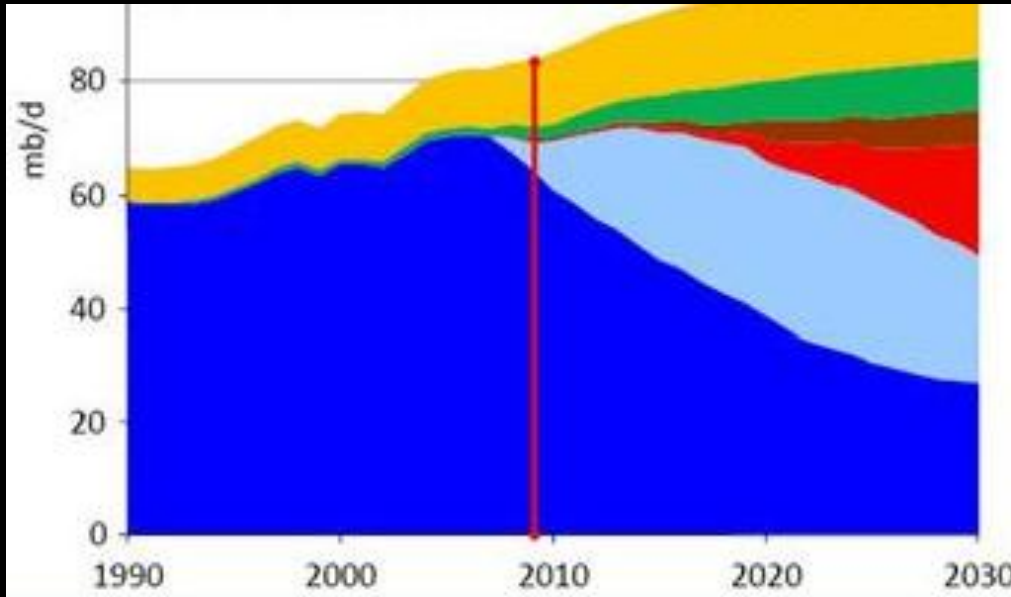


Resource Extraction Profile



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Peak Oil Equals Peak Resources

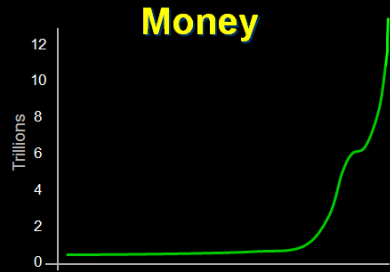


Renewables

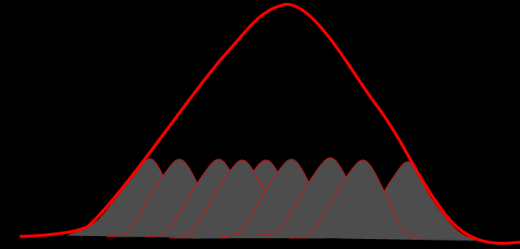


Will play a role, but NOT permit a smooth extension of the present into the future....

Must Grow

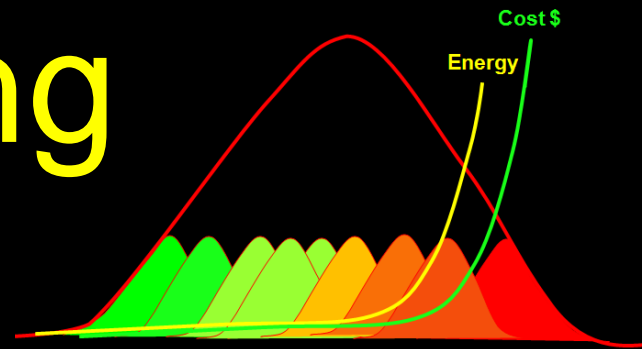


Can't Grow



**Quantity & Quality:
Equally important!**

Depleting



**PROBLEM
OR
PREDICAMENT?**

Getting The Story Right



Changing Paradigms

OLD

- More energy each year
- More resources each year
- Reliable economic growth each year

NEW

- Less energy each year
- Fewer resources
- Reliable economic shrinkage each year

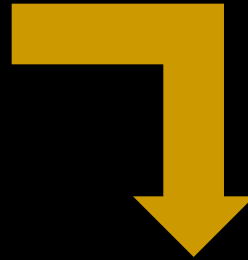
Implication: Non-status quo solutions needed

Painting the Vision

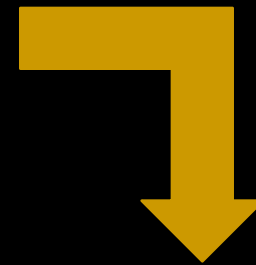


The Work

Awareness



Understanding



Solutions

A National EROEI Commission

(**E**nergy **R**eturned **O**n **E**nergy **I**nvested)

Insulate or build a new gas pipeline?

**Build a new rail line or
encourage smaller
vehicles?**

Fission or wind power?

Thank You

The Crash Course @

ChrisMartenson.com