
Peak Oil

A Turning Point for Europe

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Two views of the Oil Age

Many people do not recognise that there is an Oil Age.
Those, who do, tend to fall into two camps

EITHER

It is but a step in a technological progression

- To be followed by new technological wonders
 - A solar reflector in space ?
 - A new nuclear age ?

OR

It is an anomalous chapter in history before people
revert to simple sustainable non-consumeristic life
styles

Either way : Peak Oil is a *Turning Point*

To Know or Not-to-know

The EU dilemma

Peak Oil is easy to grasp and determine

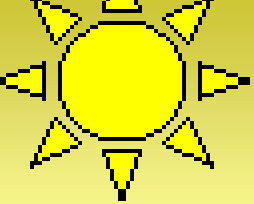
- But it carries huge implications that run in the face of classical flat-earth economics on which the EU is now based.

Intelligent analysts in the EU have long understood the serious impact of Peak Oil

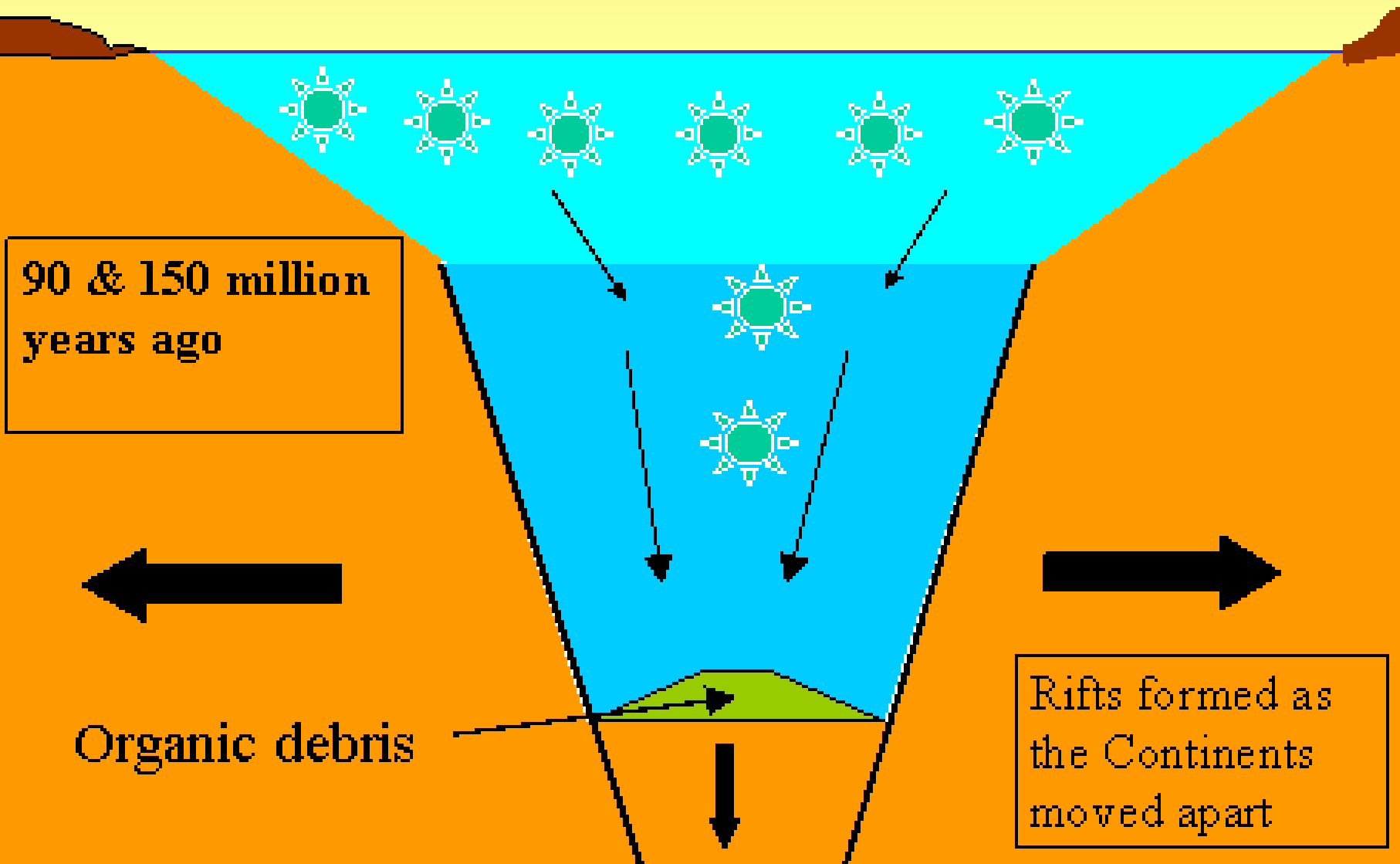
- This meeting suggests that their voice begins to be heard, whatever the political objections.
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Petroleum Geology
in
two minutes

*Finding oil is not so difficult if you look in the
right place*



Extreme Global Warming gave excessive Algal Growths



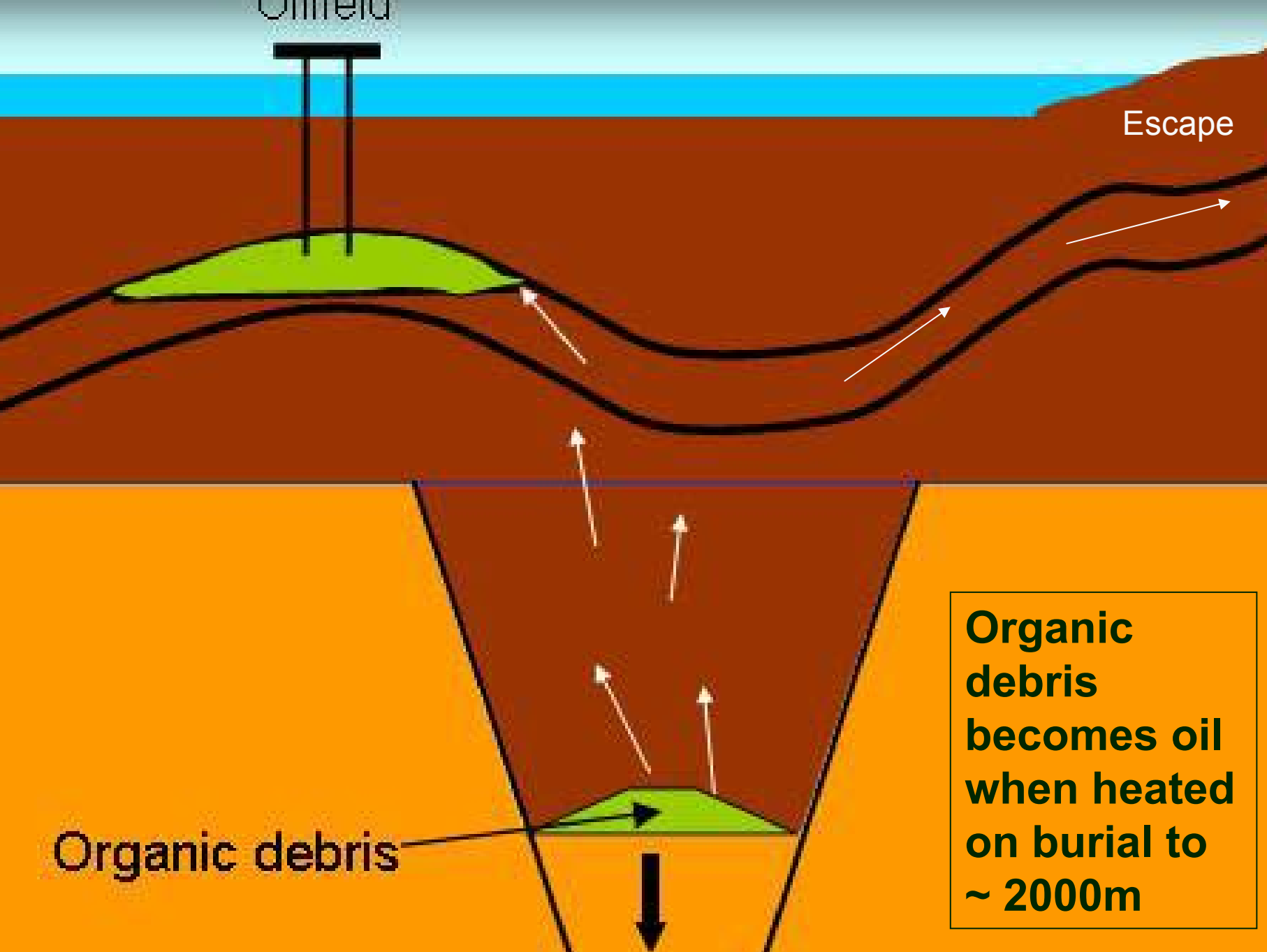
90 & 150 million years ago



Organic debris



Rifts formed as the Continents moved apart



Oilfield

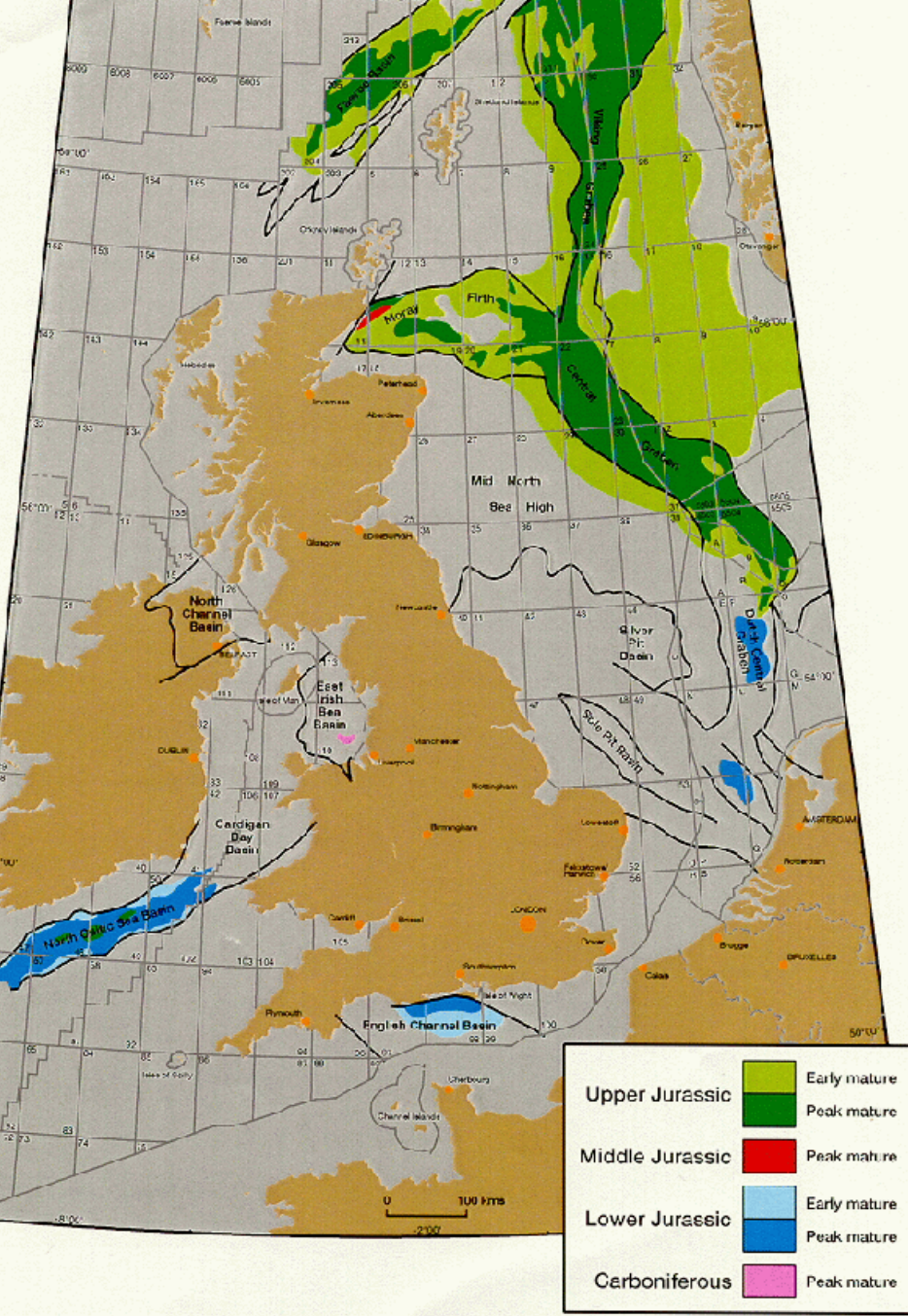
Escape

Organic debris

Organic debris becomes oil when heated on burial to ~ 2000m

N.W Europe Oil Generating Zones

*Where oil is
and
where it is not*



Little Doubt Remains

We are not about to run out of oil

- But we do come to the

End of the First Half of the Age of Oil

- This is now beyond serious dispute
 - although more work can improve the database and the depletion model.
 - ~ 50 countries have already passed their production peaks
 - Some long ago

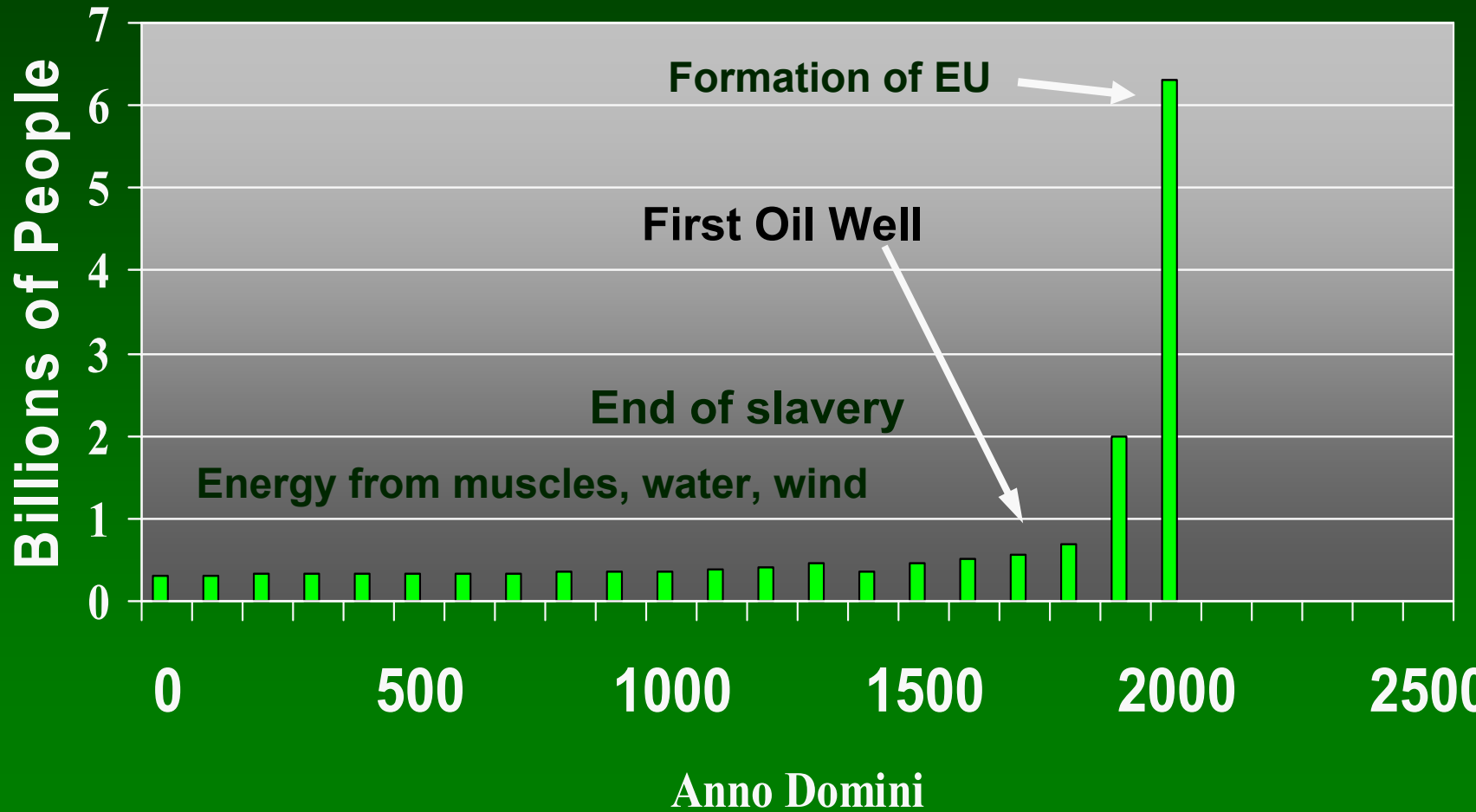
The transition to decline threatens to be a time of great international and economic tension.

- Which is why vested interests try to obscure it.
 - But it may herald a new benign age.
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The Oil Age in an Irish pub



The Population Exploded



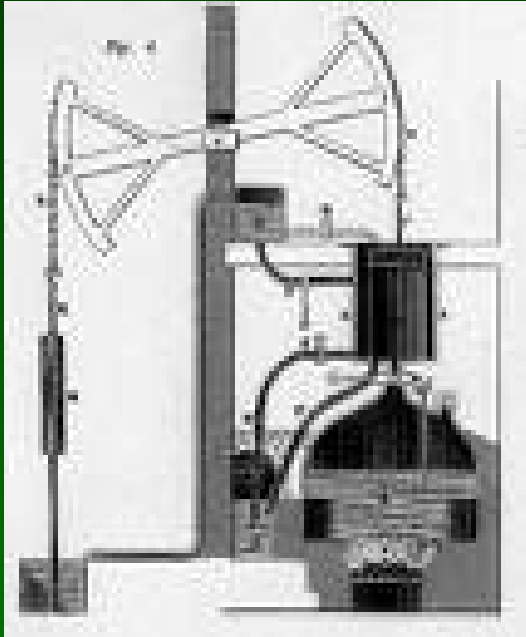
The First Half of the Oil Age

The World changed over the past Century.

- It was flooded with new energy from oil.
 - No need to dig mines : oil just flowed from the ground
- Cheap energy led to rapid growth of :
 - Industry
 - Transport
 - Trade
 - *Agriculture : a process that turns oil into food*
 - **Financial Capital**

Empires grew, based on Money and Trade.

The Pump that changed the World

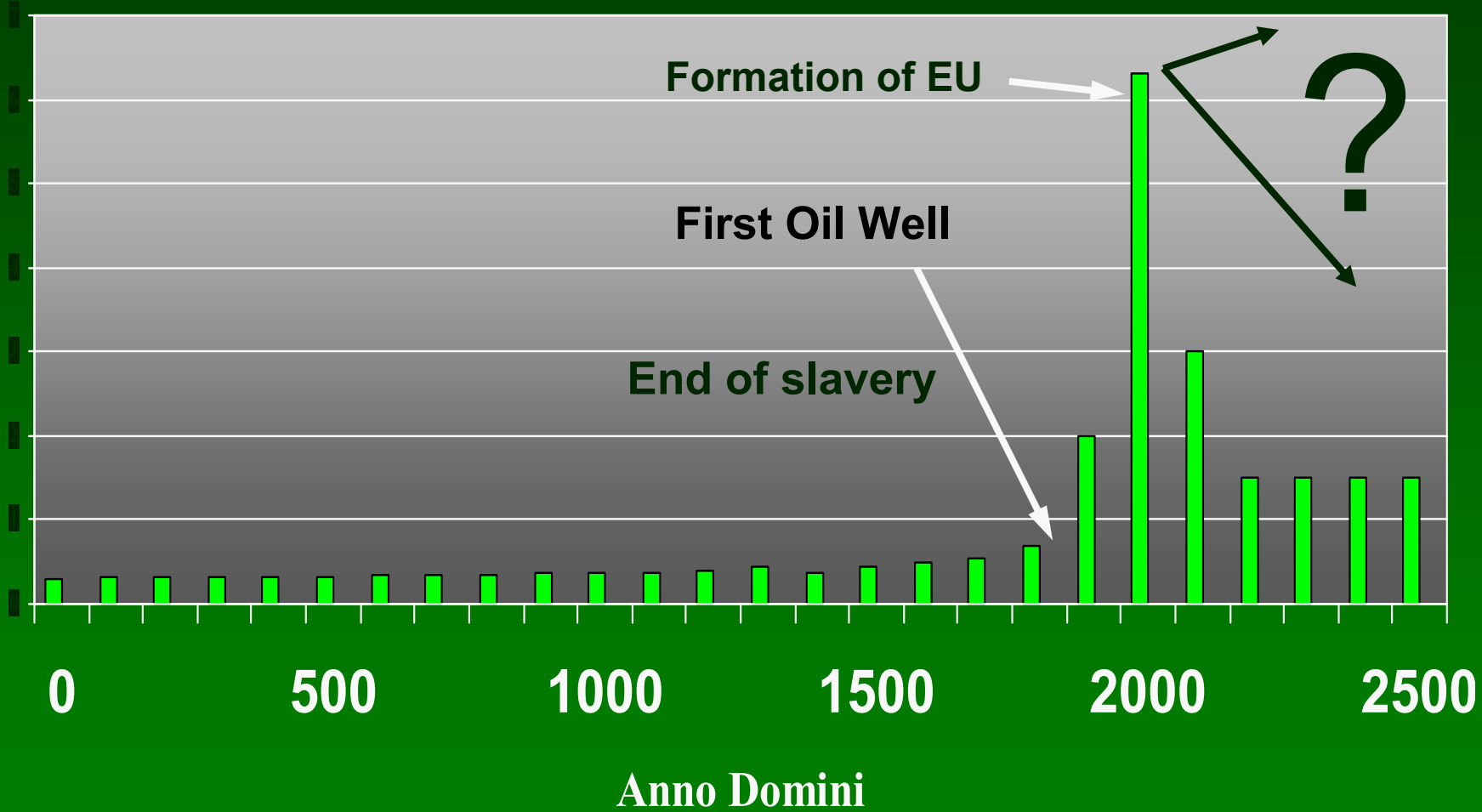


From Pump to Steam Pump to
Steam Engine to Automobile

Coal gave way to Oil



Energy Supply Exploded



Oil differs from coal & minerals

A coal deposit covers a large area being mined only where the seams are thick.

- More becomes viable if costs fall or prices rise.
 - Under normal economic principles.
- It is an issue of concentration

But there is a polarity about *conventional* oil.

- It is either there in profitable abundance
- Or not there at all.
 - The big fields are found first, being too big to miss

An environment of ***ALL or NOTHING***

- But tarsands (degraded oil) behave like coal
-

The Ironies of Depletion

- The better the technology, the faster the depletion.
 - The invasion of Iraq has failed to lift production but it has left more oil in the ground for the future
-

Classical Flat-Earth Economics

Industrial Age saw the development of *Classical Economics* to manage money.

Perceiving a ***Planet of Limitless Resource***.

Two principal precepts :

- ***Supply must match demand in an open market***
- ***One resource seamlessly replaces another as the need arises***

Nothing Money cannot buy.

- Yet the Catholic Church once did treat usury as a sin.
 - But new economic principles are being developed.
-



The Turning Point



Second Half of the Oil Age dawns

Exact date of peak is irrelevant

- **What matters is the vision of the long decline that follows.**

Depletion is at no more than 2-3% a year

- Imposed by 40 years of falling discovery and the immutable physics of the reservoirs.

Soaring oil prices reflect capacity limits

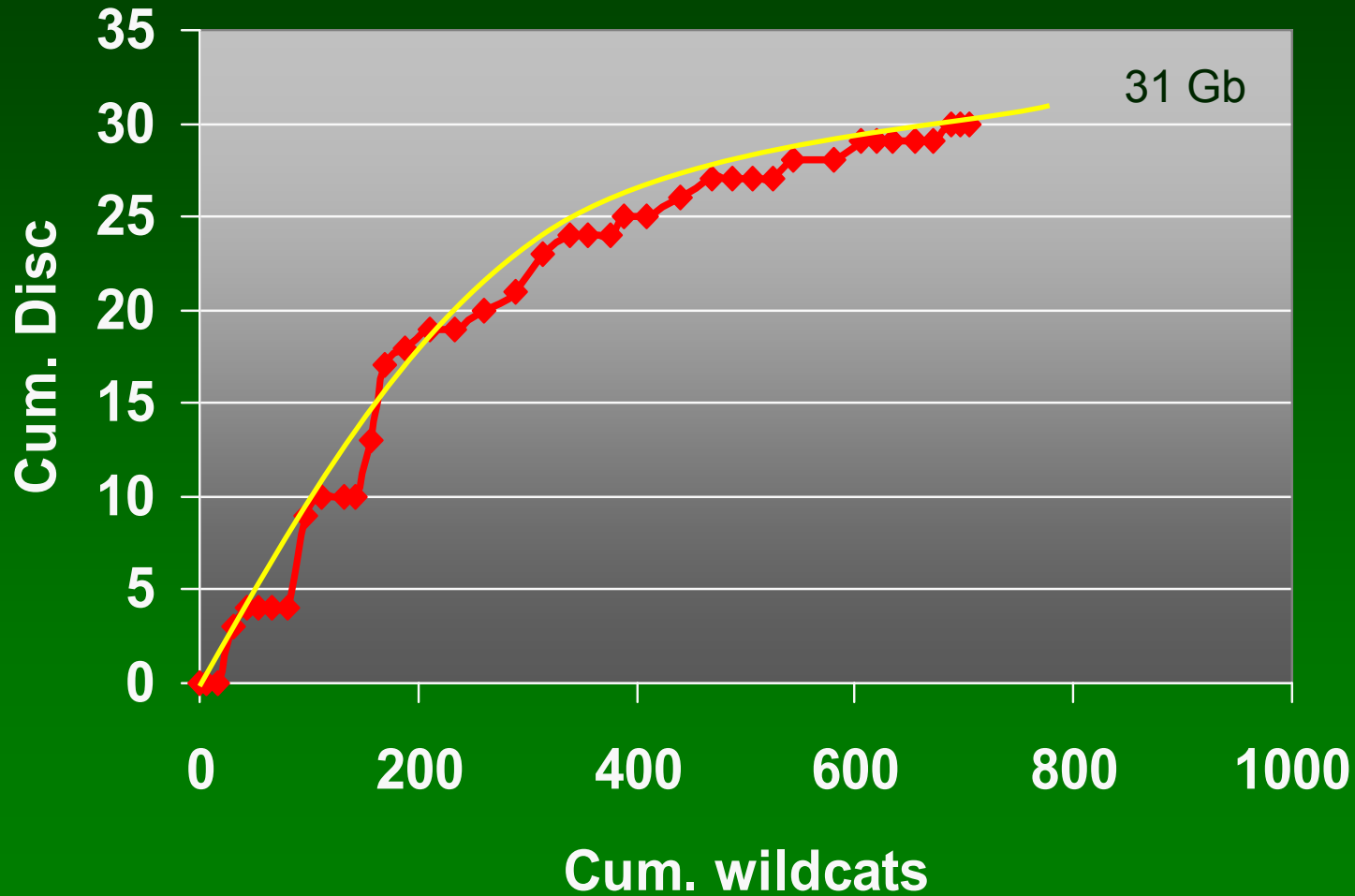
- Represent profiteering from shortage
 - Production costs are little changed
 - *Defies Classical Economics*
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Depletion : The Example of Norway

Norway is one of the few countries to publish valid data.

- It has also exploited its oil with advanced technology in a good political environment.
 - Allows costs to be written off against taxable income such that industry uses 10c dollars.
 - If more could have been found, it would have been.
 - So what does its experience tell us ?
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Norway : Discovery Record



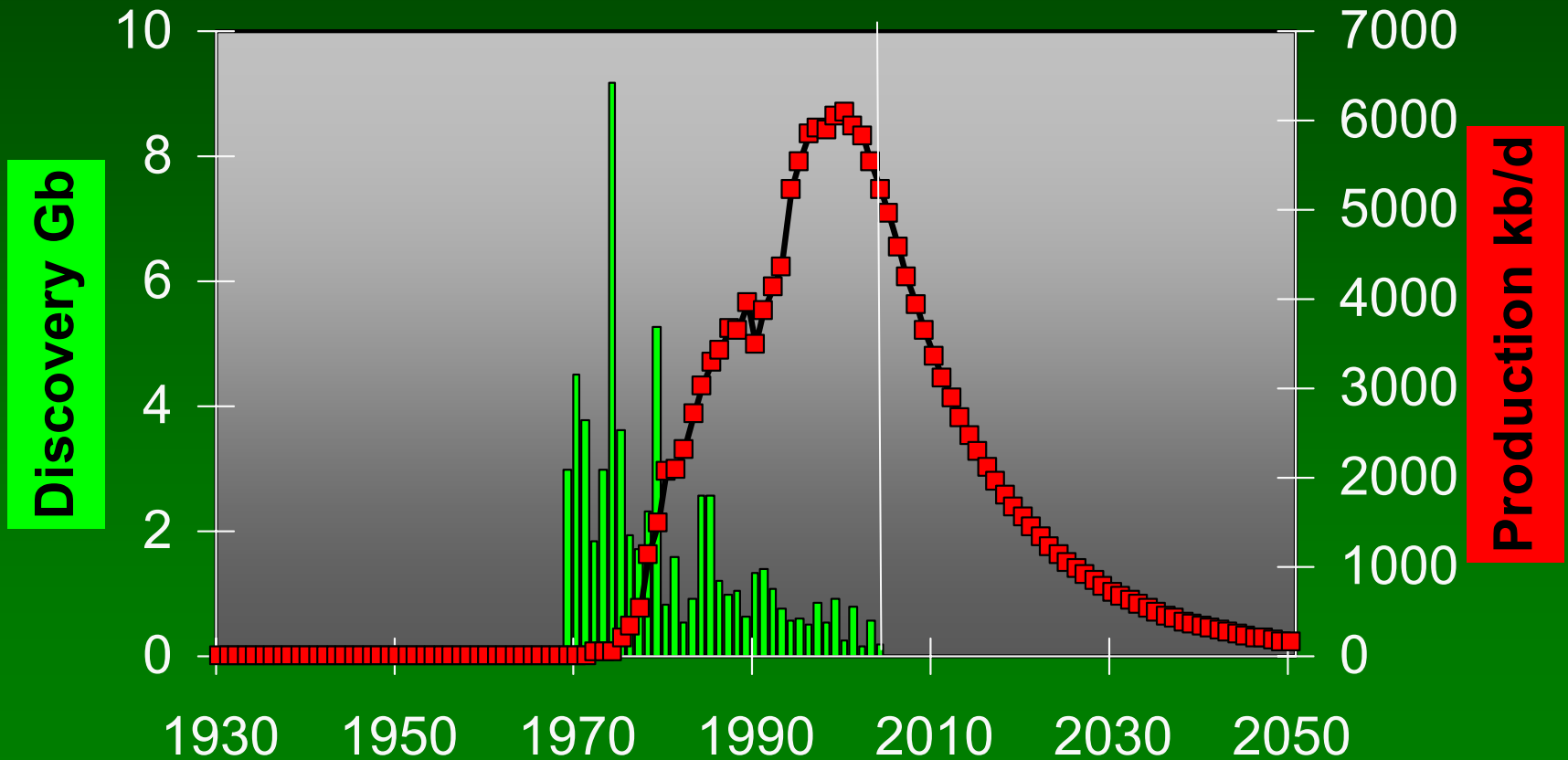
Status of Depletion in Norway

Total ever to be produced – 31 Gb (billion barrels)

- Produced to-date – 19.5 Gb
 - Left to produce in known fields – 10.5 Gb
 - Left to find ~ 1 Gb (in small fields)
 - Peak Date – 2001 when ~50% had been produced
 - Exploration boreholes drilled – 712
 - 10% successfully found an oilfield
 - Peak exploration drilling in 1997 when 37 boreholes drilled
 - By 2005: only 11 boreholes because there were fewer valid prospects left (advanced technology defines them better)
 - Depletion Rate – 7.9% (high efficiency)
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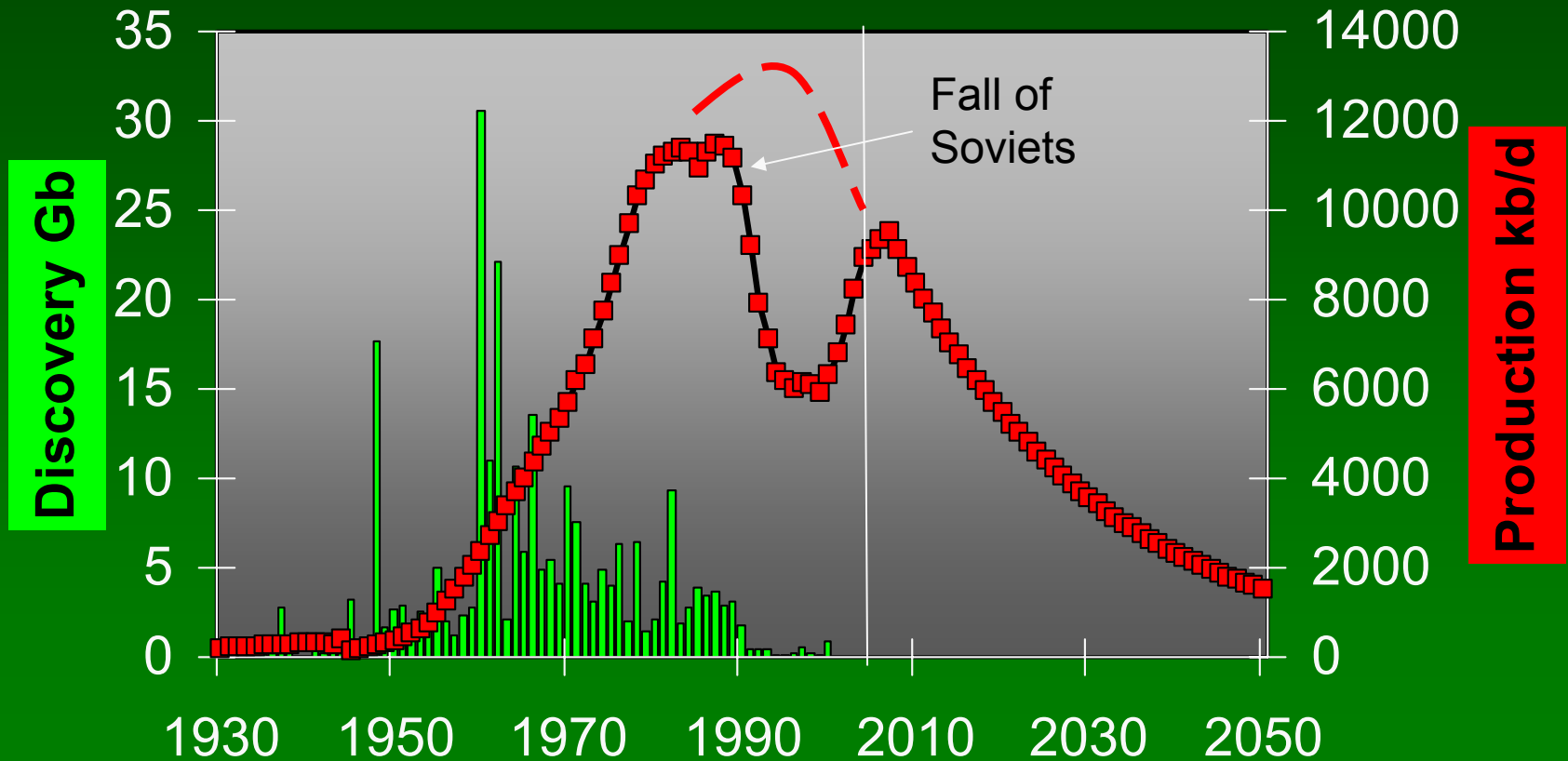
North Sea

Peak to Peak - 22 years



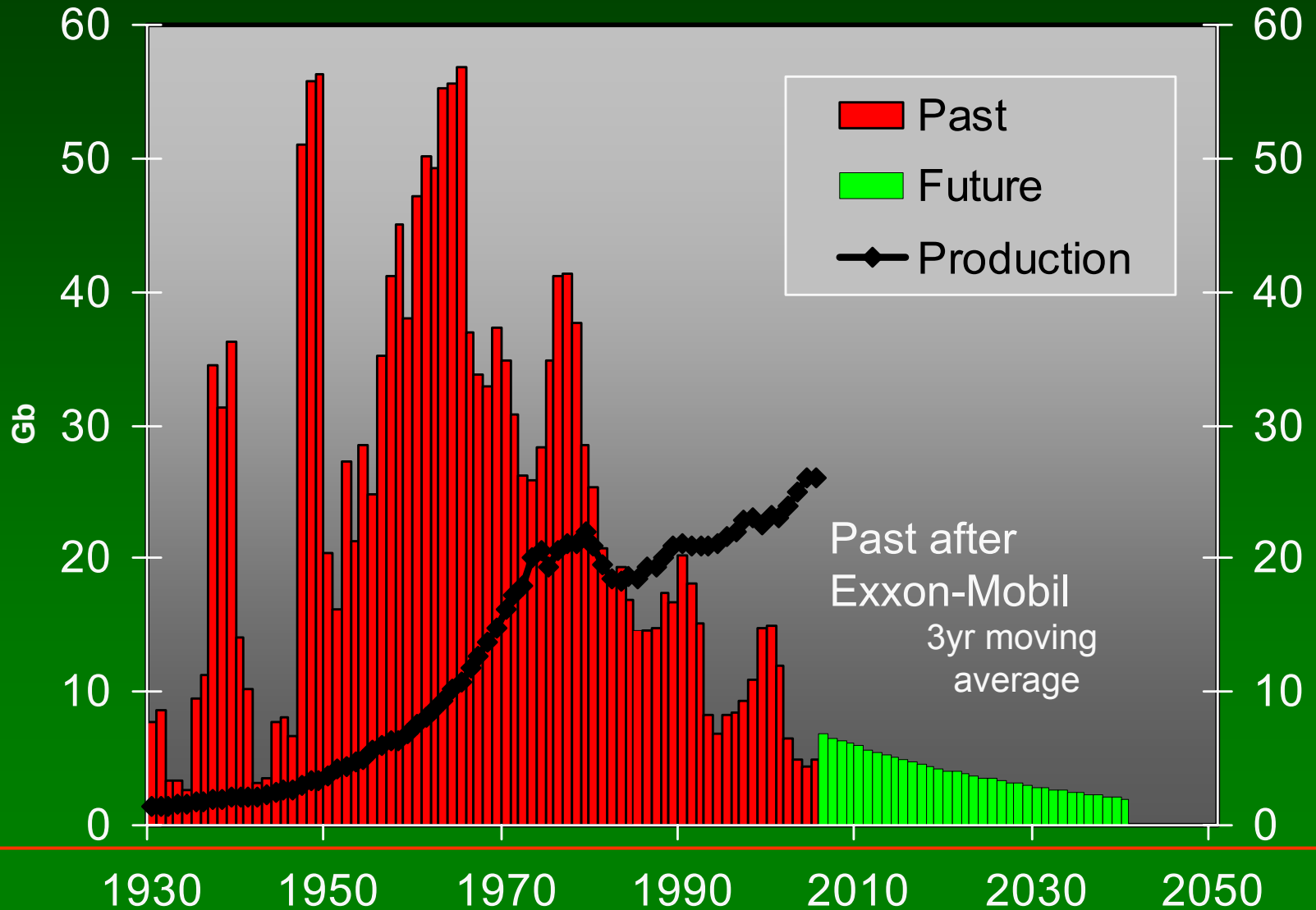
Russia

Peak to Peak ~ 35 years



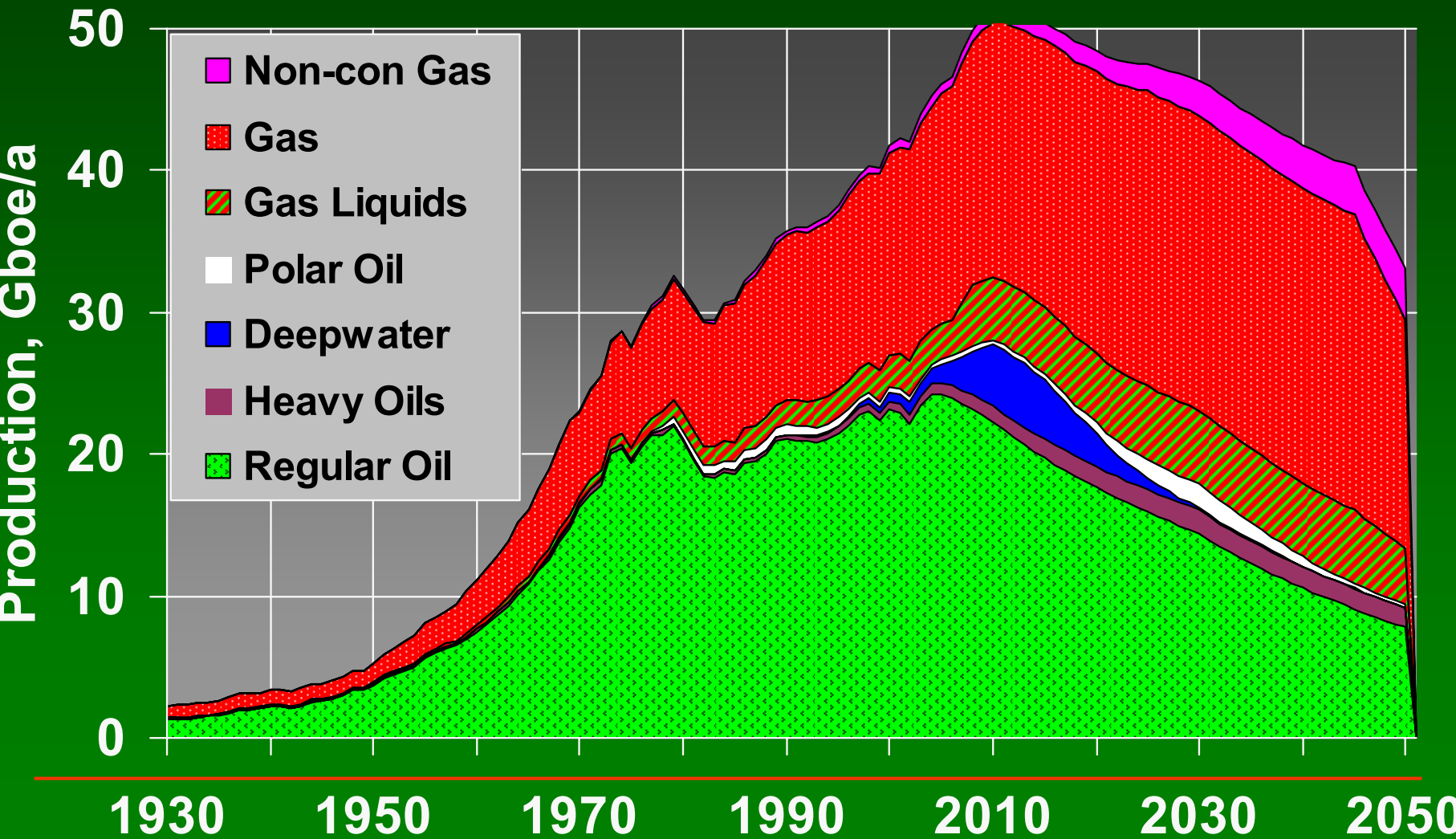
Status of World Depletion

Discovery peaked 40 years ago



World production peaks follow

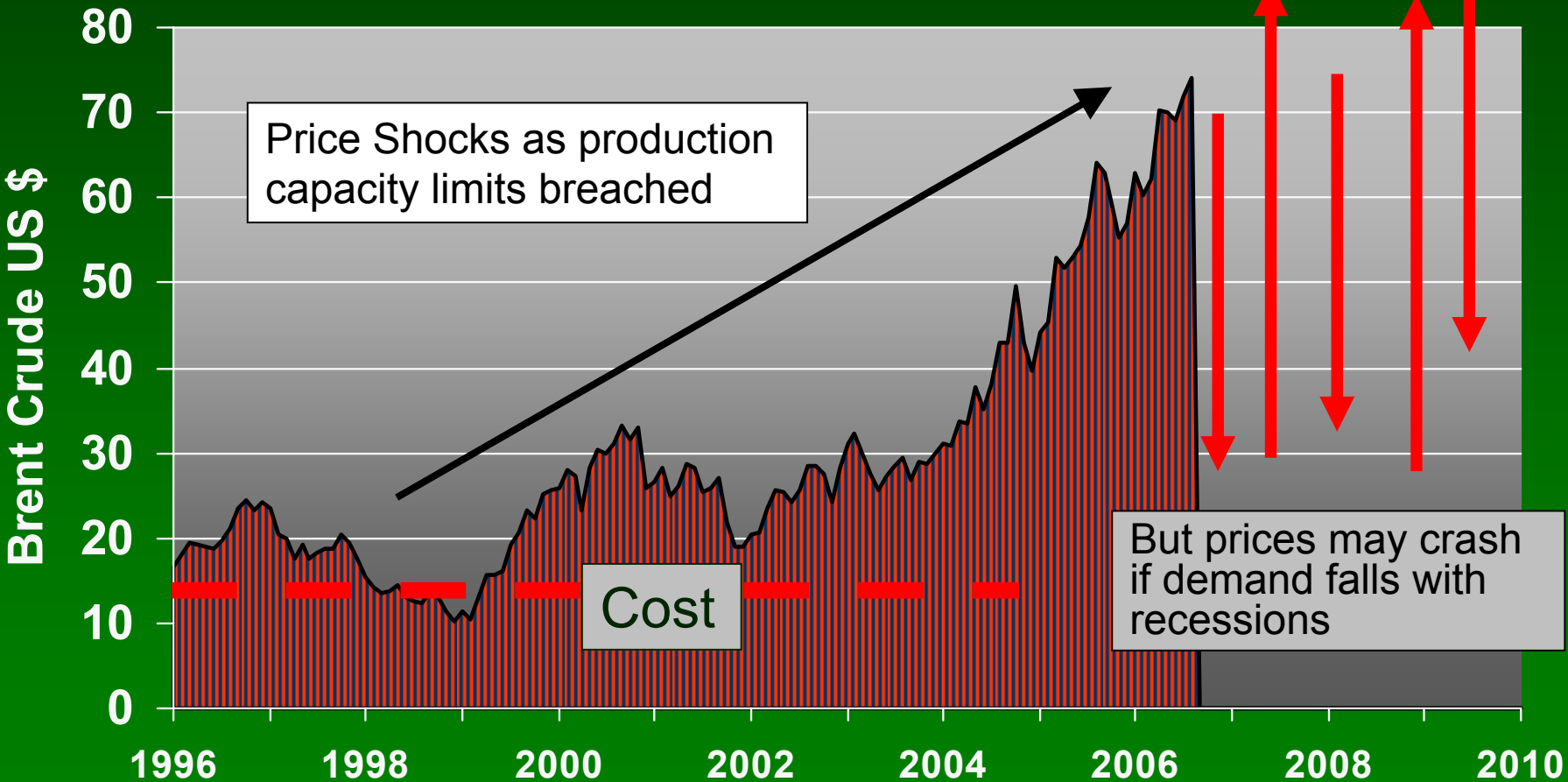
You have to find it before you can produce it



Oil Price Shocks

First Signs of Crisis

Price - five times cost to produce
giving false liquidity



Price Shocks as production
capacity limits breached

Cost

But prices may crash
if demand falls with
recessions

*The Response by the
European Union*

How Will the EU React ?

Formed at end of the **First Half of the Oil Age**

- At first: a co-operative project; but now based on expansion and out-dated economics
- **But the Maastricht Treaty does provide sound foundations for a new regionalism**

“No decision at any level higher than it need be”

- It is time to end denial and admit that oil depletion is the principal driver of future policy
-

The EU should inform itself

The EU should now inform itself properly

- Perhaps without revealing its knowledge
 - Build an inventory of the world's oilfields
 - Concentrate on the larger fields
 - Not a particularly difficult task
 - Concentrate on historical production
 - Extrapolating trend indicates how much is left
 - Be cautious of reported "*Reserves*",
 - often defined in commercial, financial or political terms
-

EU Research

EU Research Plan

Form the team to build a working model

- (5 people with common sense)
- Adopt the ASPO model and data as a framework
It is probably correct to +/- 20%

■ Check, improve and refine, but accept each step as a valid basis for planning

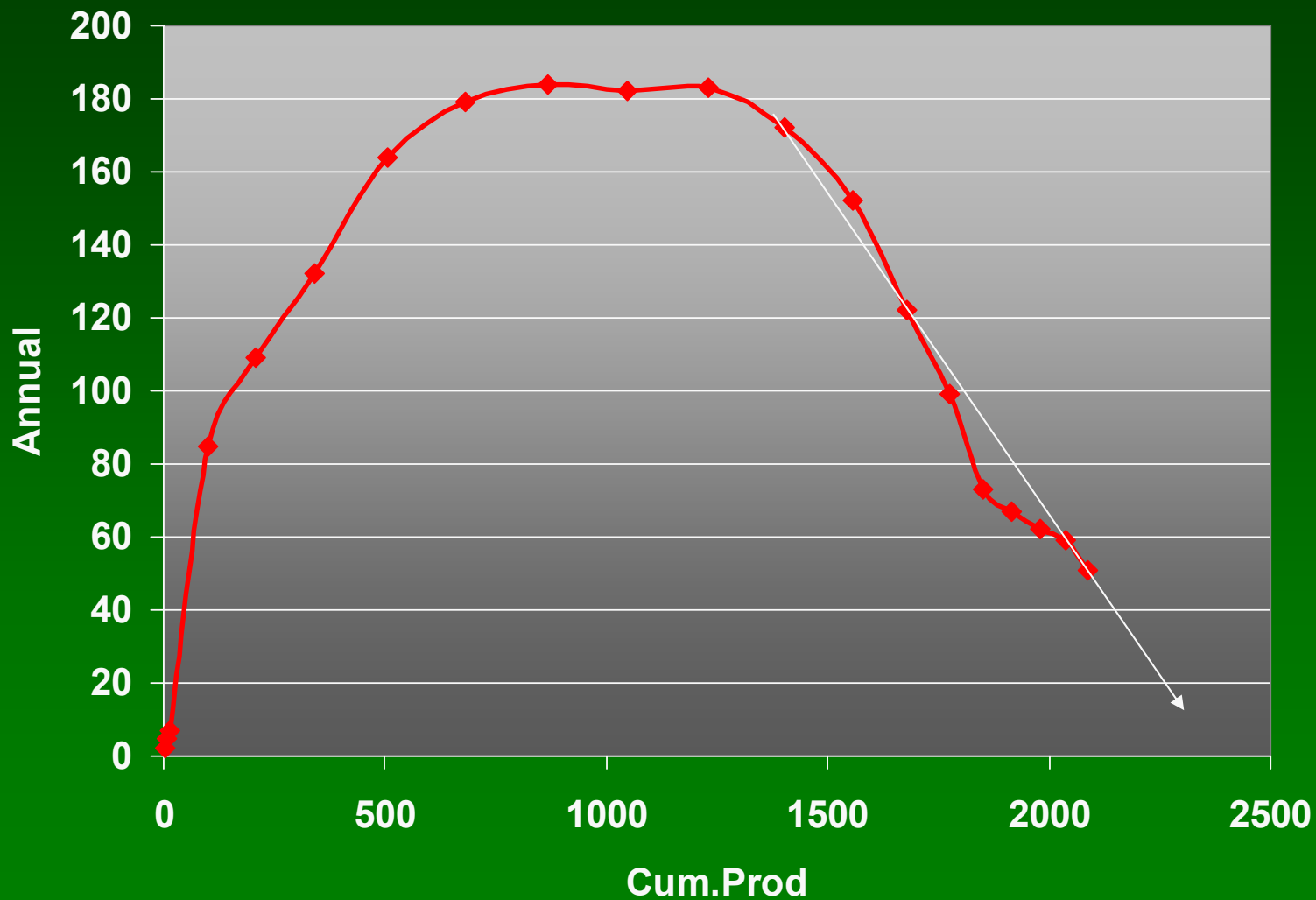
- Update for 2006 Production
- Finish by February 2007

Then evaluate all alternative energies

- Look especially at Net Energy Yield
 - Evaluate the political, social & economic impacts
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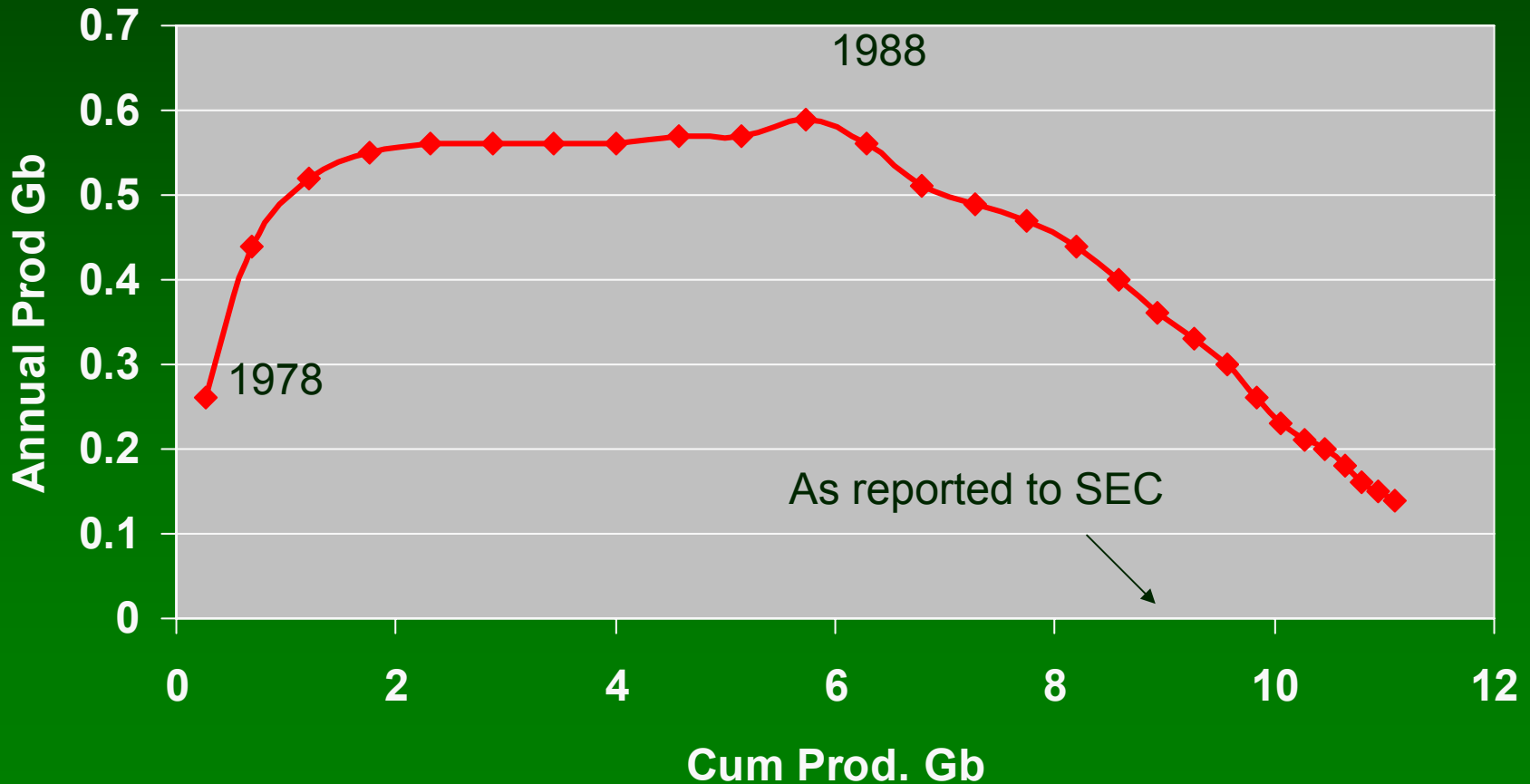
Oseberg Field of Norway

Production trend supports official estimate of 2.4 Gb



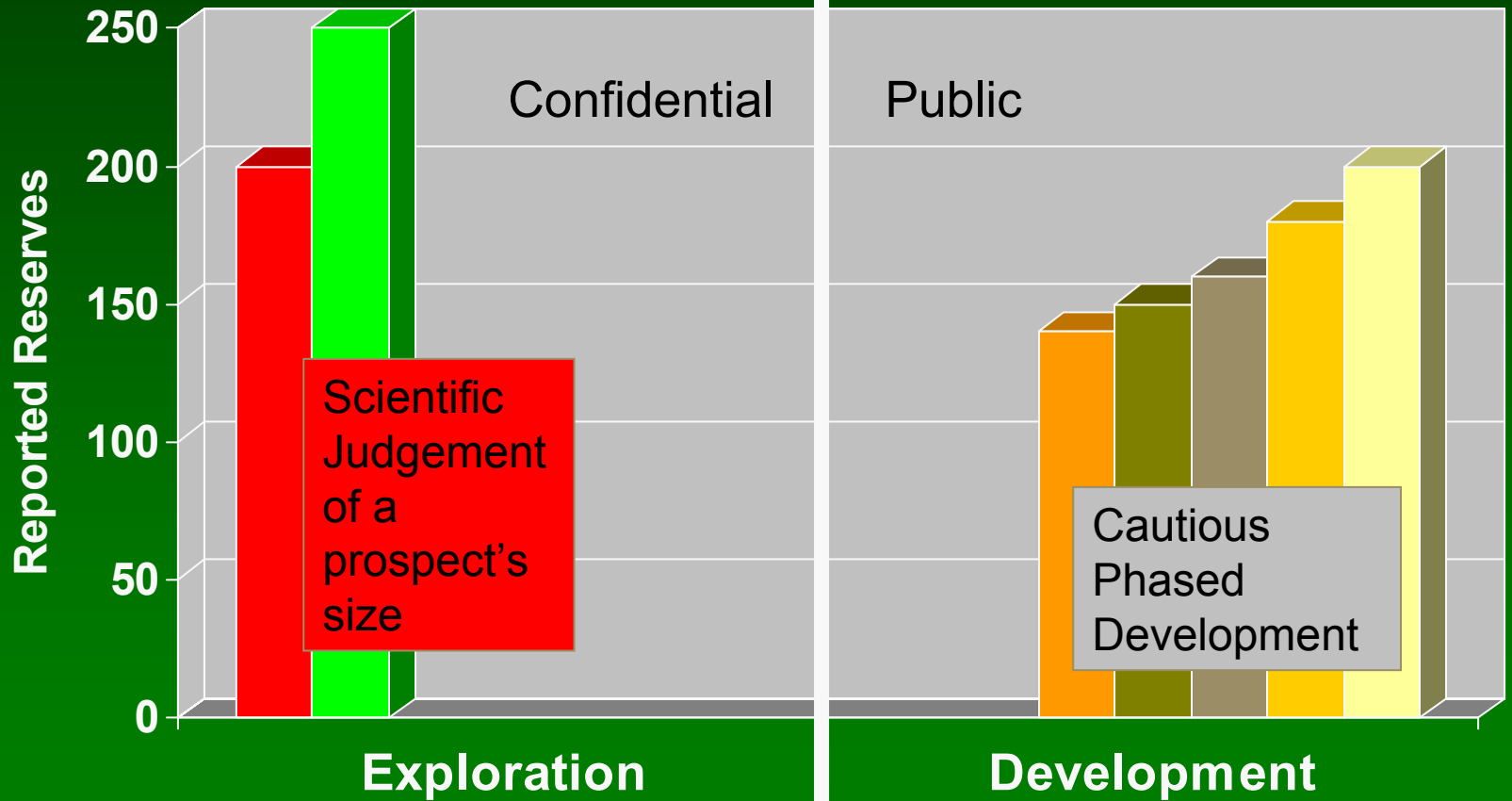
Prudhoe Bay, Alaska

Operator estimated 12.5 Gb in 1972 but reported 9 Gb to comply with strict SEC rules. All modern technology applied but added nothing unforeseen.



“Reserve Growth”

“Selling” the project to management to meet Economic Criteria



	A.Dhabi	Iran	Iraq	Kuwait	N.Zone	S.Arabia	Venezuela
1980	28	58	31	65	6.1	163	18
1984	30	51	43	64	5.6	166	25
1985	31	49	45	90	5.4	169	26
1986	30	48	44	90	5.4	169	26
1987	31	49	47	92	5.3	167	25
1988	92	93	100	92	5.2	167	56
1989	92	93	100	92	5.2	170	58
1990	92	93	100	92	5.0	258	59
1991	92	93	100	95	5.0	259	59
1992	92	93	100	94	5.0	259	63
1993	92	89	100	94	5.0	259	65
1995	92	88	100	94	5.0	259	65
1996	92	93	112	94	5.0	259	65
1997	92	93	113	94	5.0	259	72
1998	92	90	113	94	5.0	259	73
1999	92	90	113	94	5.0	261	73
2000	92	90	113	94	5.0	261	77
2001	92	90	113	94	5.0	261	78
2002	92	90	113	94	5.0	259	78
2003	92	126	115	97	5.0	259	78
2004	92	126	115	99	5.0	259	77
2005	92	126	115	100	5.0	261	78

OPEC Reserve Reporting

Competing for Quota

Kuwait 1984
 Produced = 22 Gb
 Remaining = 64
Found = 86 (~ 90)
 or
 Increasing Recovery from 30% to 40%



Facing Reality



How to face Reality

Inform the people

- Unaware of their energy use and dependency.

Cut Waste - now monumental & unrecognised.

- Introduce energy rationing
 - Tradable quotas become a new form of currency

Turn to renewable energies from

- Tide, sun, geothermal, wind, wave, biomass
- Nuclear too ??

Live differently : give up consumerism

Restrict imports

The **Rimini Protocol** requires importers to cut imports to match world depletion rate.

- Namely, annual production as % of what is left.
 - Now ~ 2.5% a year

Consequences : demand matches supply

- World export oil prices fall to match cost
 - Allowing poor countries to afford their needs.
 - End of false Petrodollar liquidity from profiteering.
 - **Consumers forced to face reality.**
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Thank You
and
Good Luck
