

The Oil Drum

DISCUSSIONS ABOUT ENERGY AND OUR FUTURE



Where We Are Headed: Do Electric Cars Fit In?

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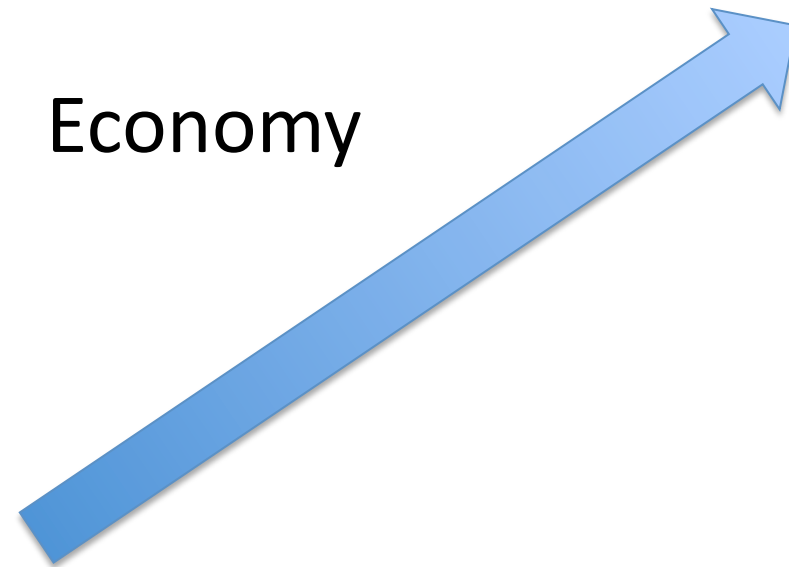
Editor, The Oil Drum

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Outline

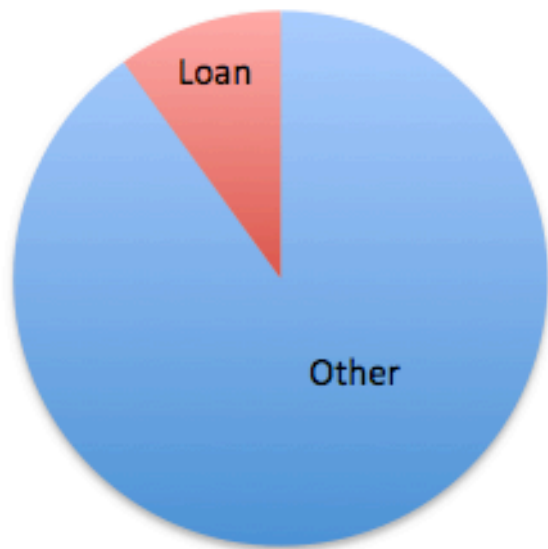
- Our One-Way Economy
- The Energy Stumbling Block
- What is Peak Oil?
- Where is the Energy Sector Headed?
- Long-Term Prospects
- Implications for Electric Cars

Our One Way Economy:
Our economy is designed to grow

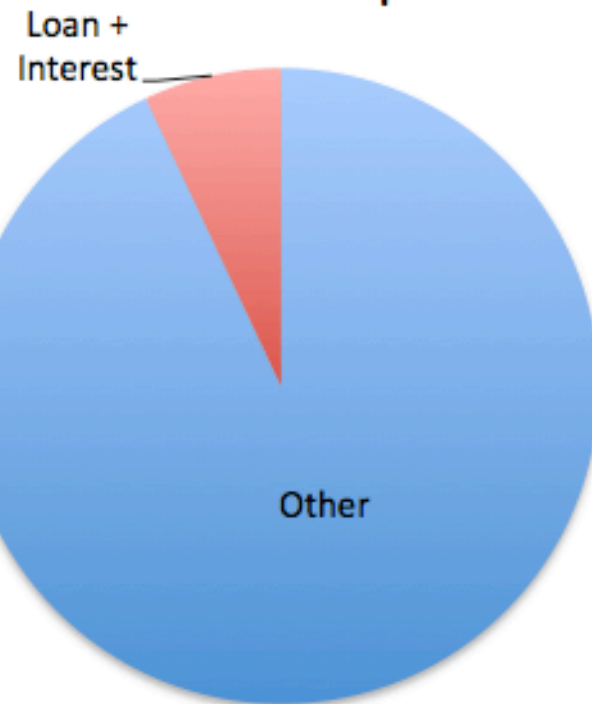


Repaying loans is easy in a growing economy

Loan as Originated

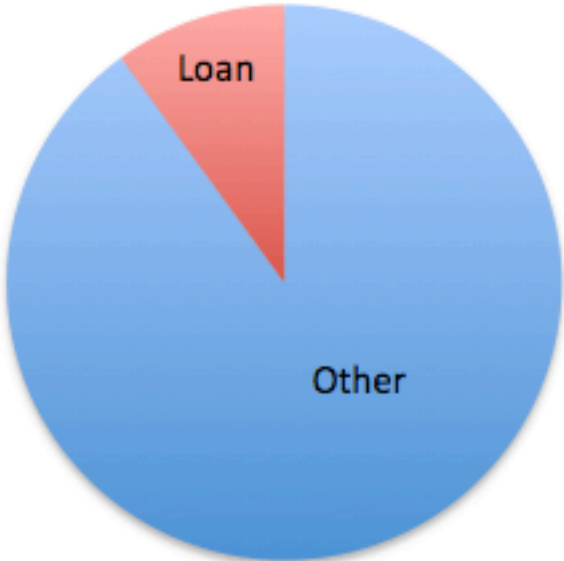


Loan as Repaid

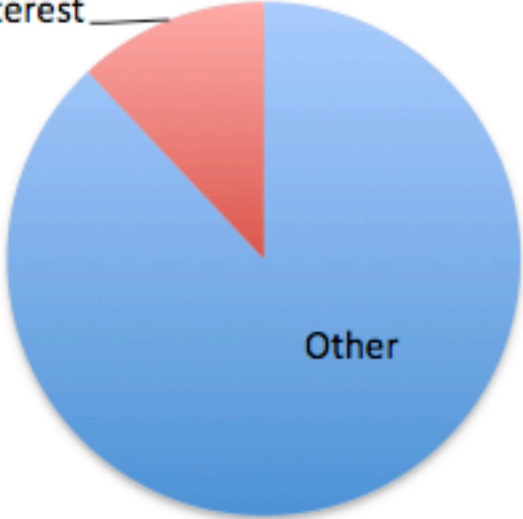


Repaying loans is much more difficult in a shrinking – or flat - economy

Loan as Originated



Loan as Repaid
Loan + Interest



A declining economy also makes planning capital investments difficult

- Prospects for a new factory look great now
 - How about 20 years from now?
 - Or even 10?
- How does one amortize costs?
- Why would a lender be willing to lend?

Our economy “works” because it is growing

- Once it stops growing, everything comes “unglued”
 - Debt can’t be repaid
 - Huge numbers of businesses go bankrupt
 - Entire financial system looks “shaky”
- This is why Bernanke and Geithner are trying to get US and world economies to grow again.

The Energy Stumbling Block

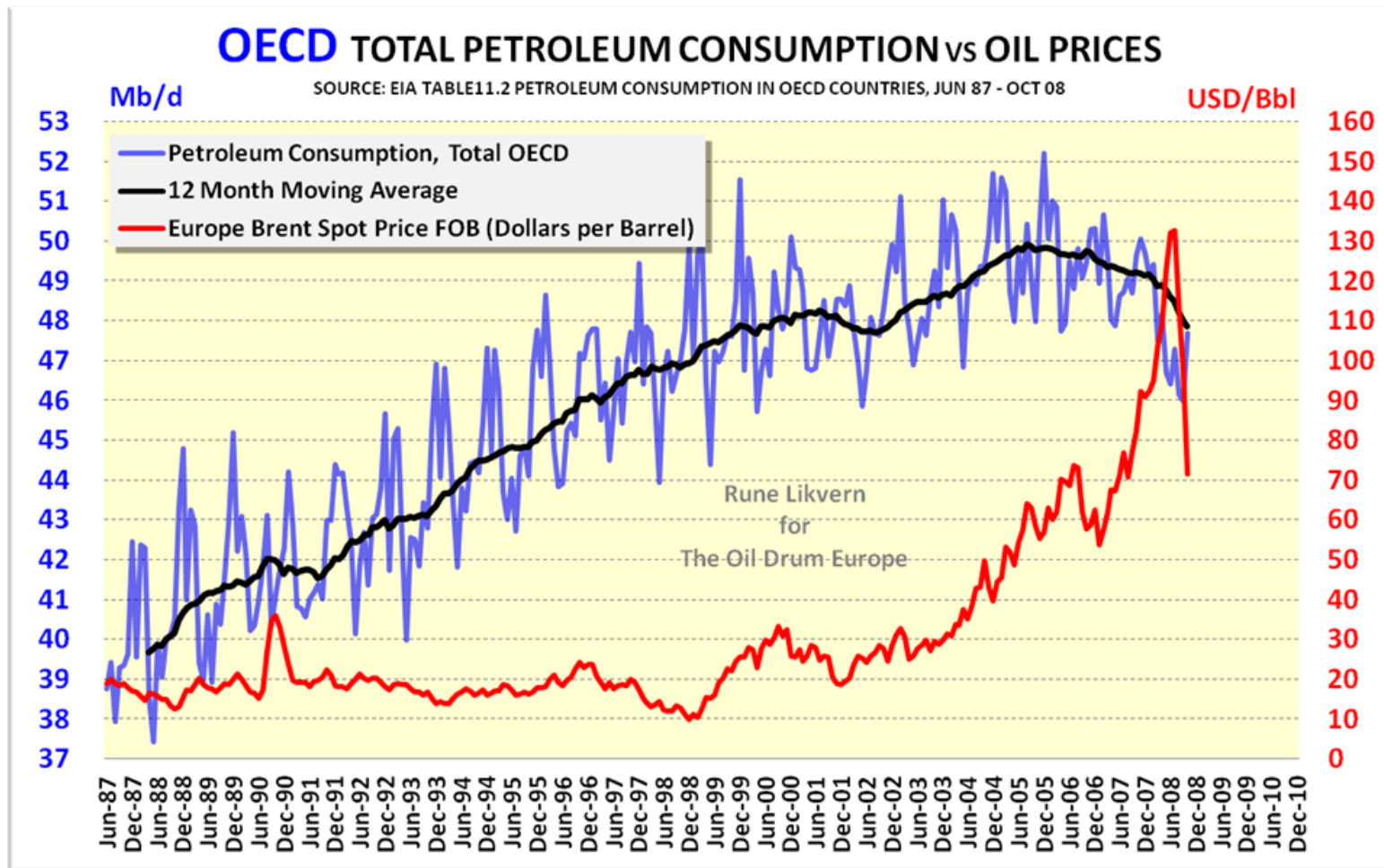
- ***Cheap energy*** has helped fuel our current system
 - ***Cheap energy*** keeps our factories buzzing
 - ***Cheap energy*** keeps our cars running
 - ***Cheap energy*** leaves consumers with enough money that they can repay their mortgages
 - ***Cheap energy*** permits globalization

Cheap energy can't go on forever

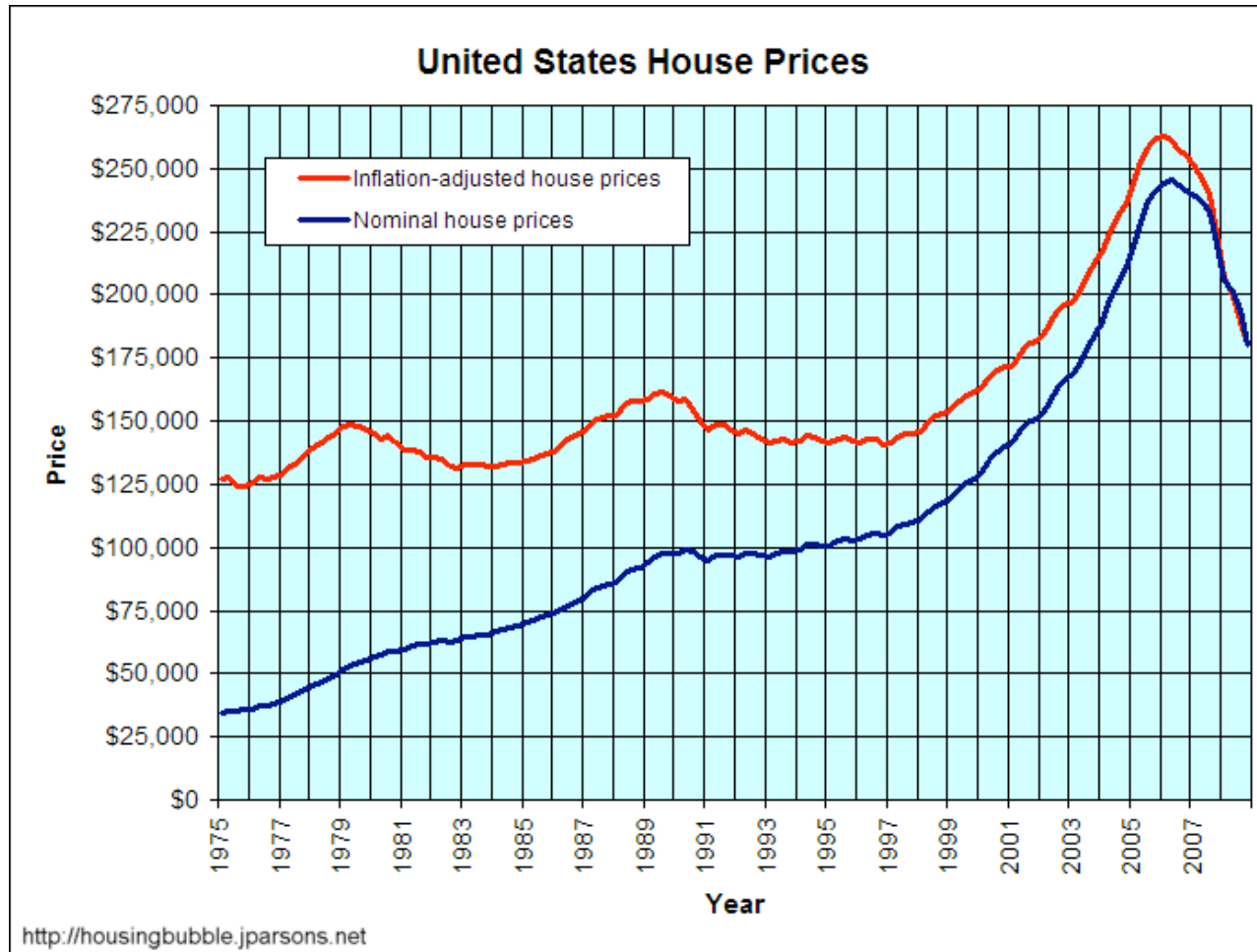
- We live in a finite world
 - Eventually the ***cheap energy*** gets used up
 - Need to move on to ***expensive***, hard to extract energy



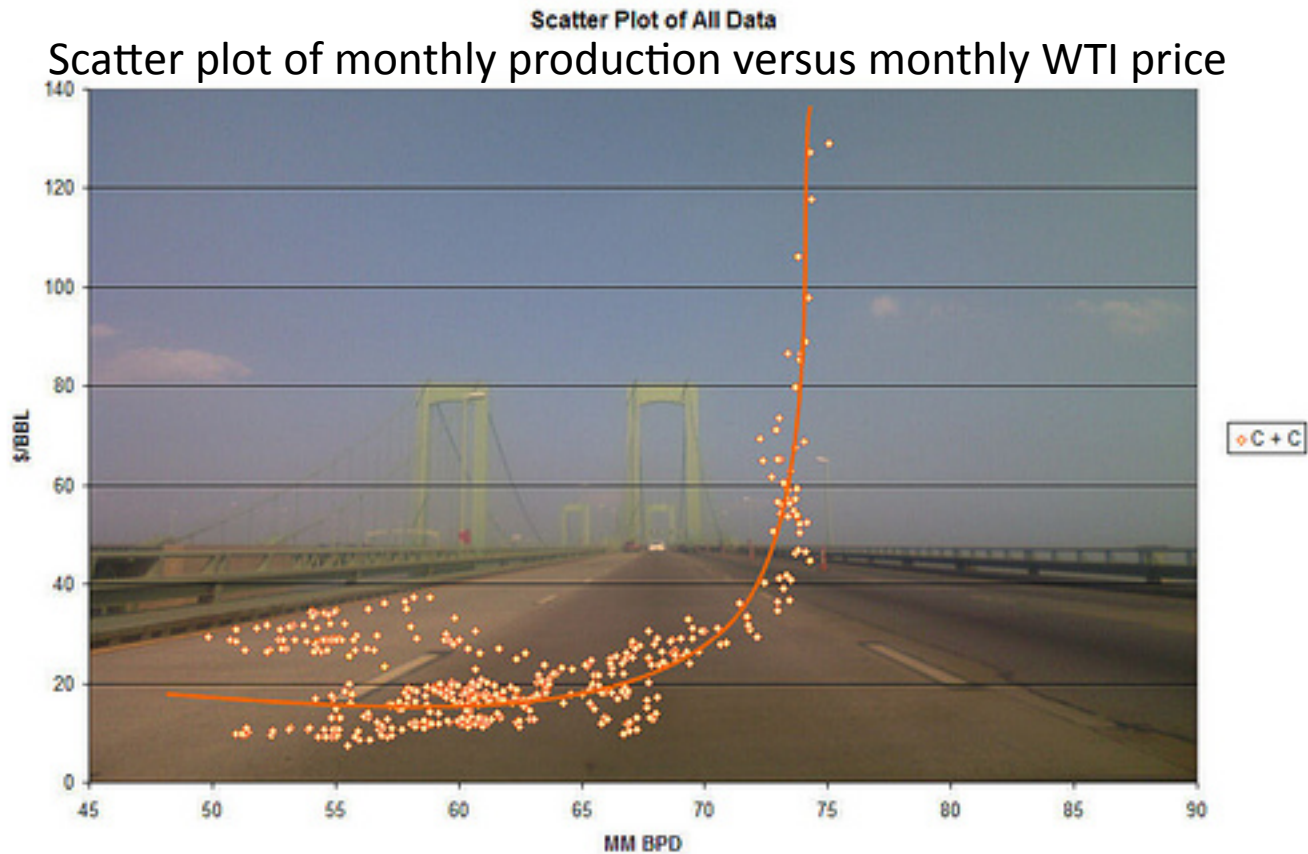
High energy prices began impacting consumption back in 2006



About 2006, homeowners began having many more debt problems.



Prices kept rising, until a break came in July 2008

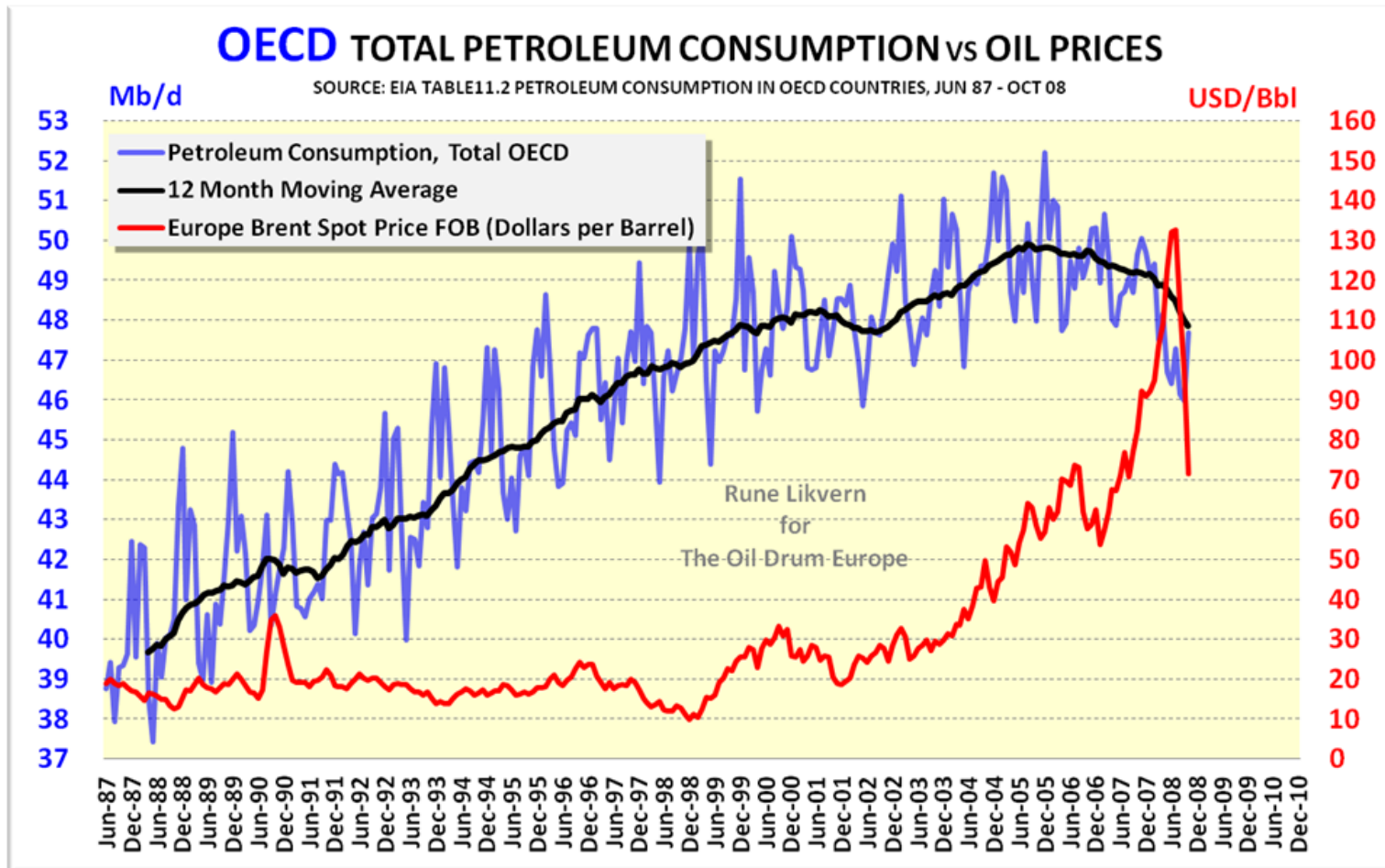


Graph by Starship Trooper, 12/8/2008, The Oil Drum

High oil prices -> General credit unwind
-> Drop in demand -> Low oil prices

- Higher oil prices affected housing as soon as 2006
- By July 2008, started affecting credit more generally
- Without credit, consumers can't buy cars, houses
 - Businesses can't invest
 - Everything comes to a halt; growth stops

Let's look at the consumption and price chart again



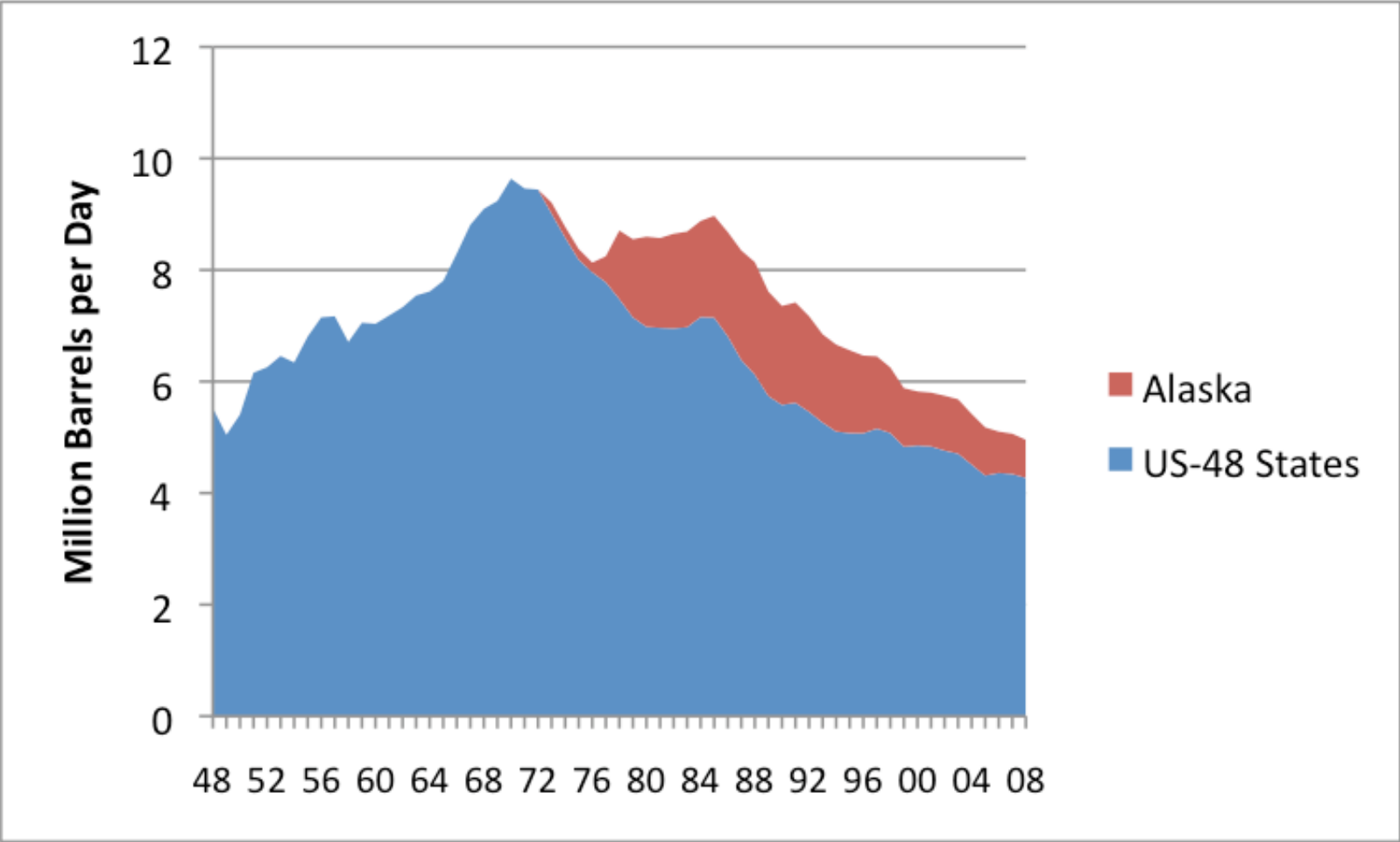
Even with the high price of oil, oil purchases began to decline

- Higher price of oil didn't add much oil production
 - Developing world started taking more of the total
- When oil growth stopped, economic growth hit limits
 - Debt started to unwind
 - Financial system started to collapse
- World is not in the position of 1970s with easy alternatives

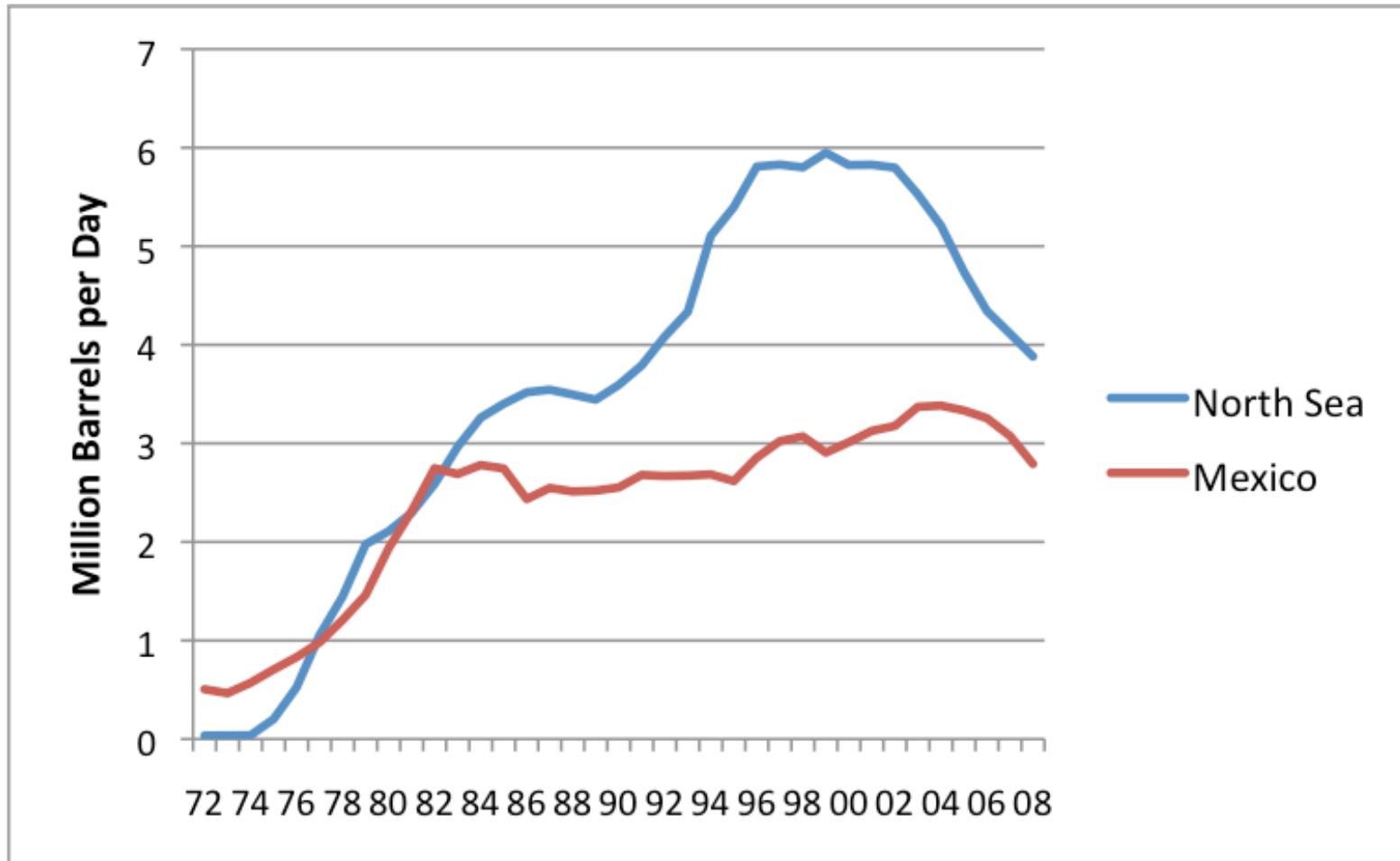
Peak Oil Theory

- In any location, oil production rises, hits a peak, and declines
 - Reason has to do with pressure and water mixture
 - Timing can be predicted in advance
- Also likely to happen worldwide
 - Peak in early 2000s long predicted

US oil production peaked in 1970

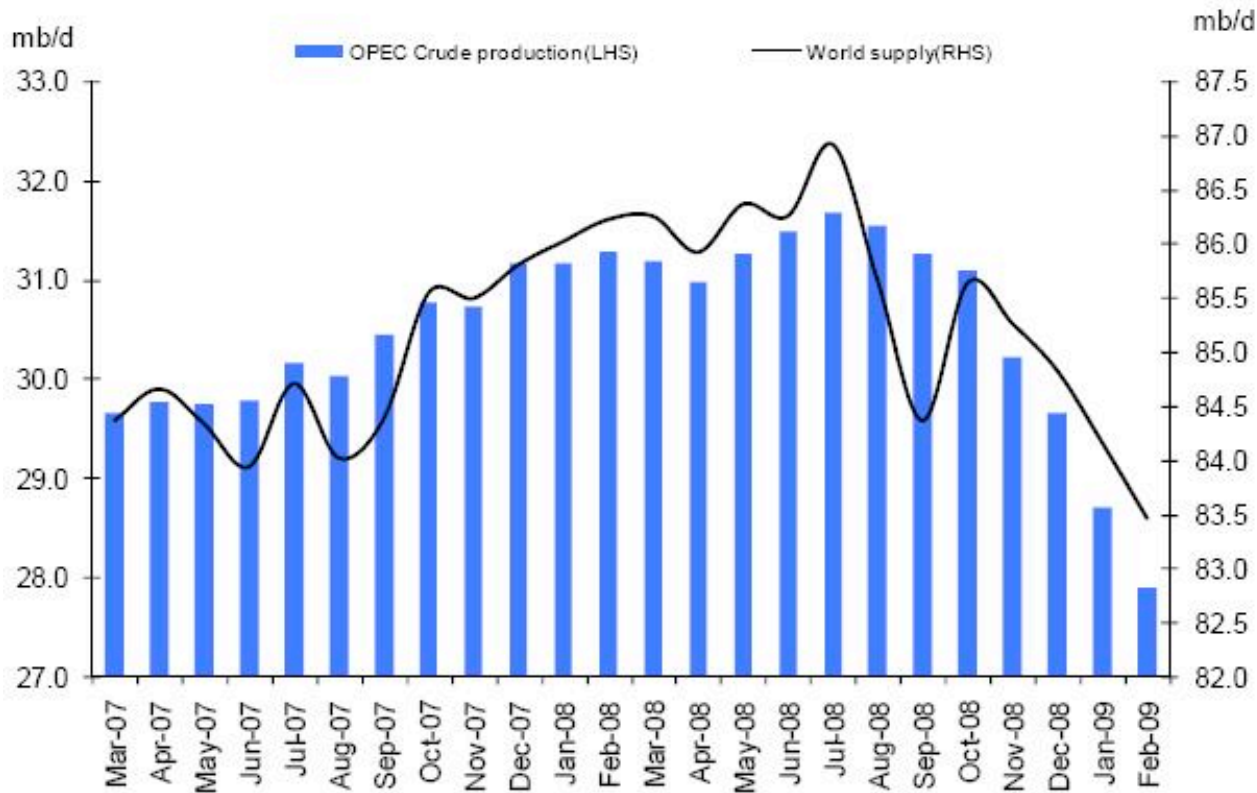


North Sea and Mexico were added,
but they also began to decline



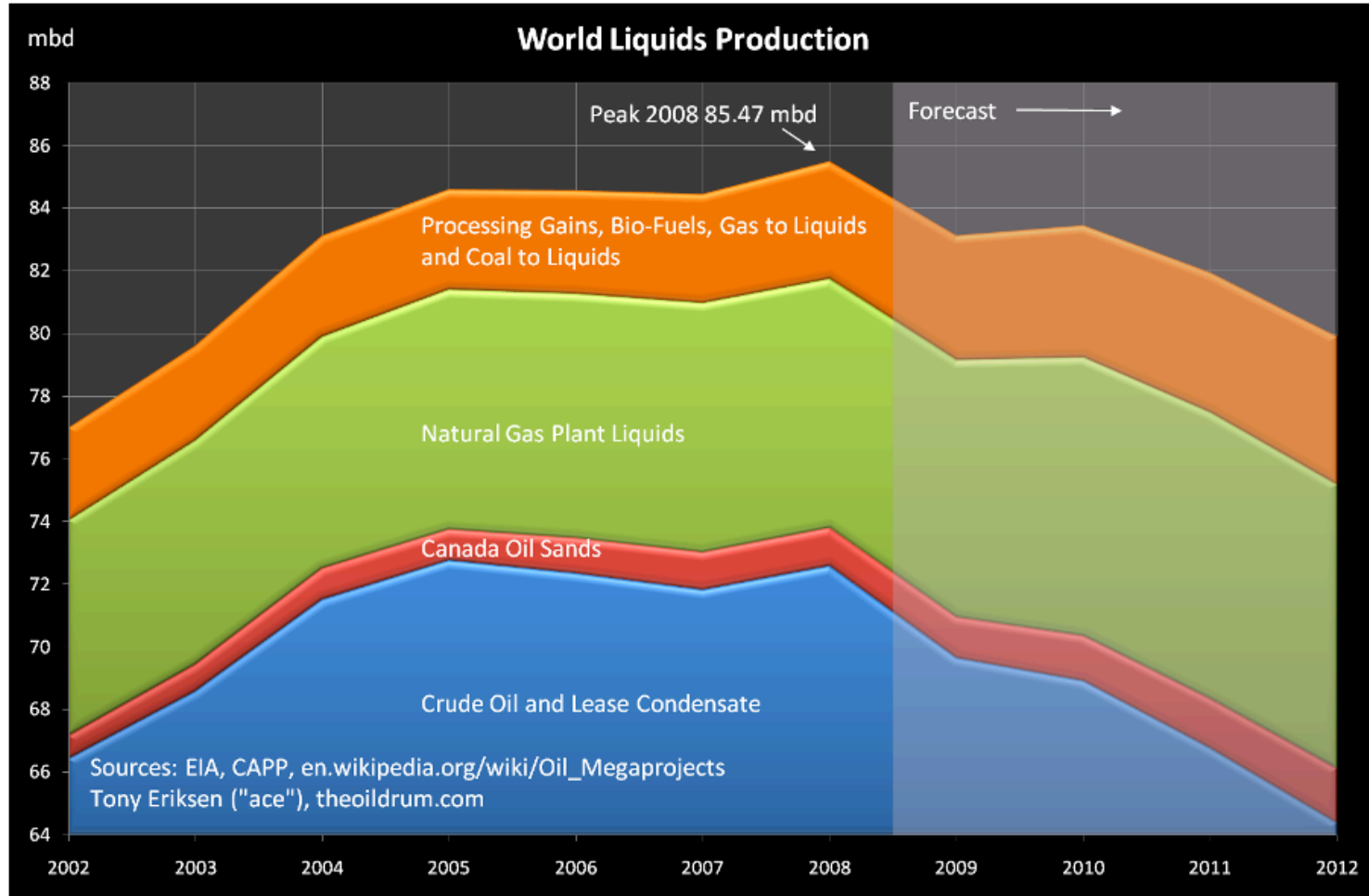
Now, it is beginning to look like world oil production is beginning to decline.

Graph 25: OPEC and World oil supply



<http://www.opec.org/home/Monthly%20Oil%20Market%20Reports/2009/pdf/MR032009.pdf>

World oil decline is likely based on Tony Eriksen's analysis of planned projects.



Where is the energy sector headed?

- Credit unwind is the overwhelming issue
- Nearly all sectors are falling apart simultaneously
 - Oil
 - Natural gas
 - Wind
 - Solar
 - Nuclear
- Coal would be the bright spot, except for climate change legislation

Credit unwind causes problems

- Direct problems
 - Energy companies can't get credit
 - Customers can't get credit
- Indirect problems
 - No credit -> low demand -> low price
 - Low price -> low cash flow
 - Low cash flow + no credit -> low investment
- Result: New investment drops greatly

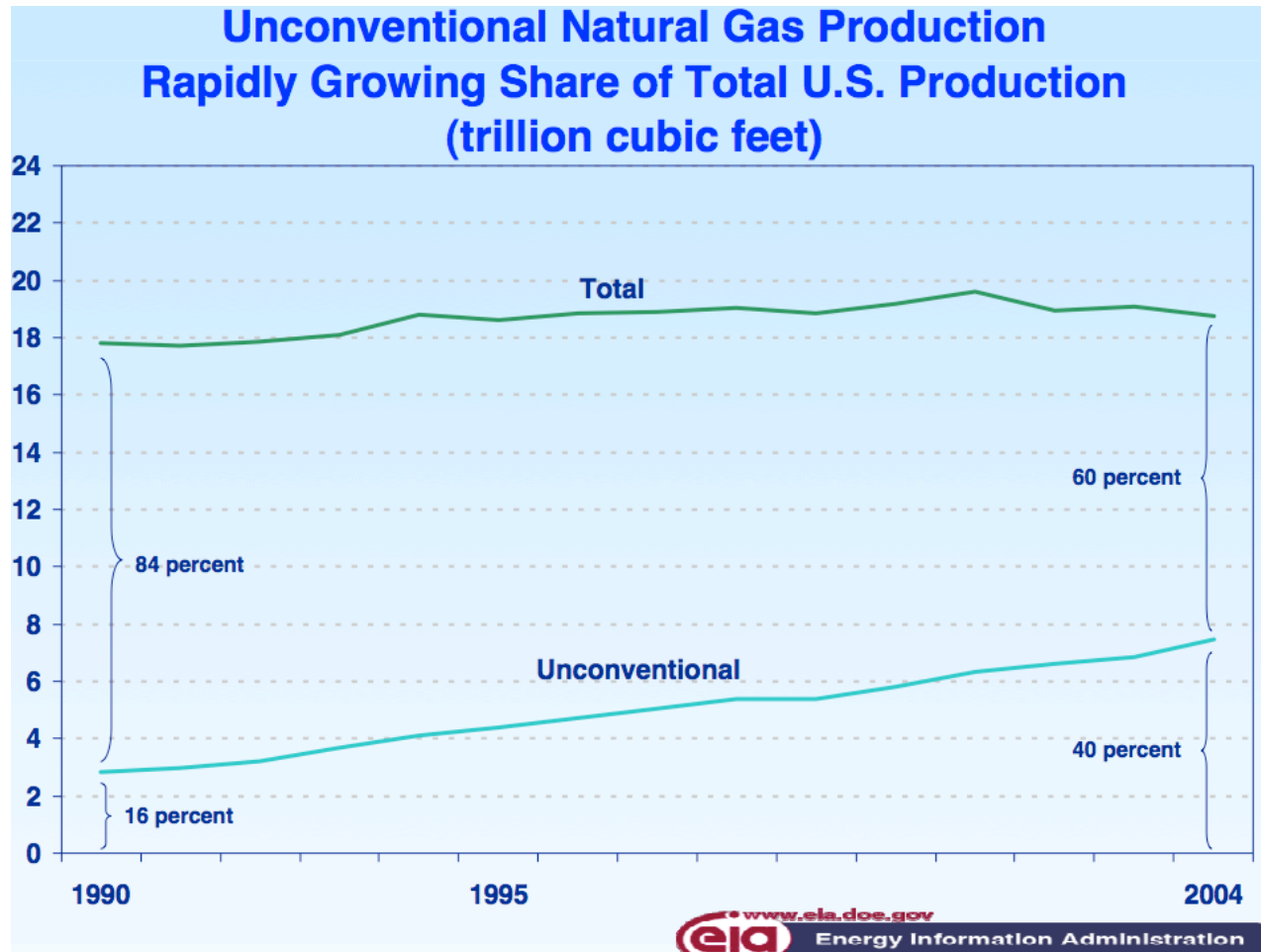
Lots of supply out there

We can't get to it!

(Low price, no funds to invest)

- Deep water oil
- Canadian oil sands
- Unconventional natural gas
- Wind
- Solar
- Ethanol
- Electric cars

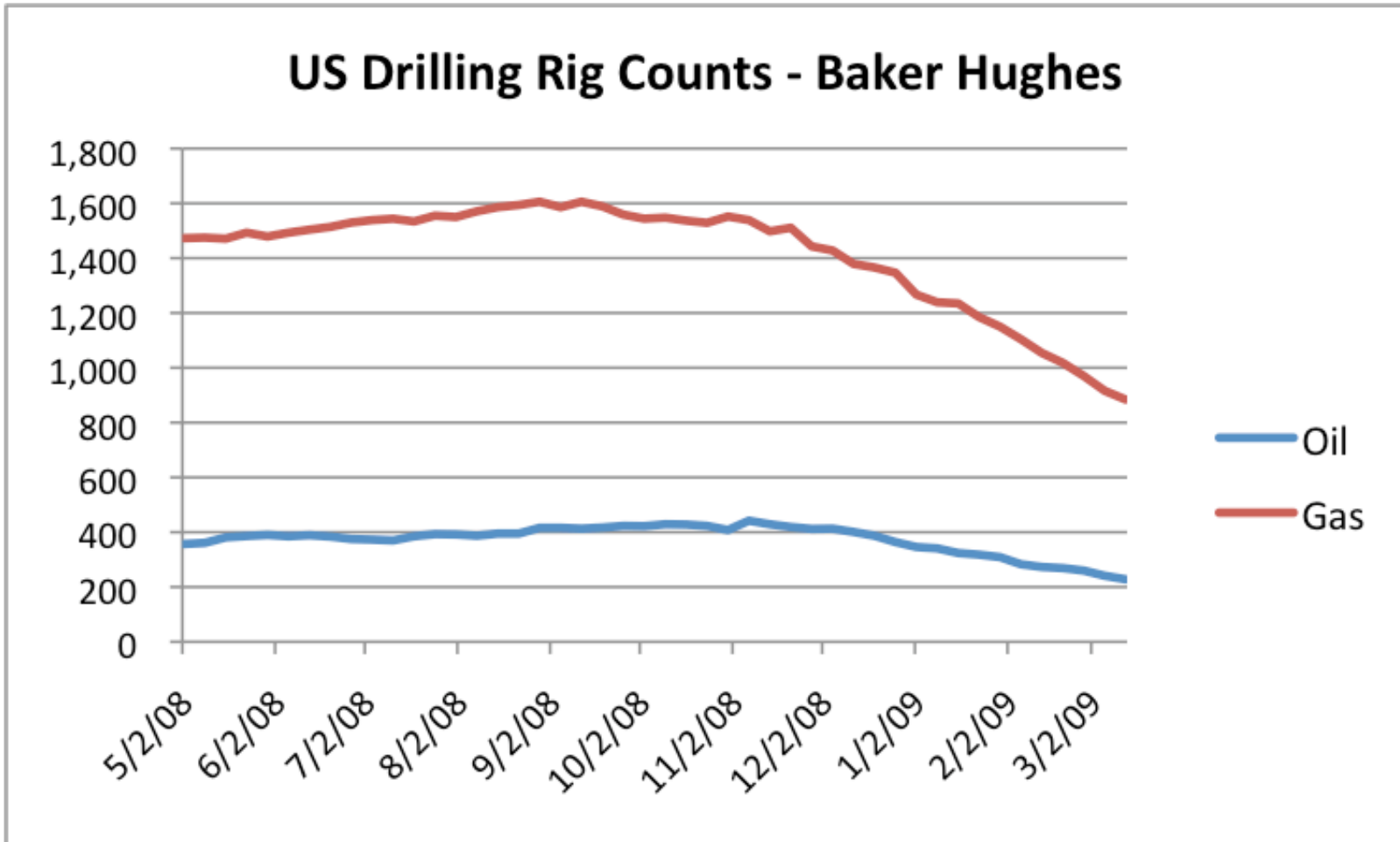
Natural gas could be available with a higher price



Natural gas production is likely to decline soon.

- Unconventional gas is expensive
 - Too expensive to produce at today's prices
- Companies in this field are mostly small, highly leveraged
 - Credit problems, no options but cut back
- Proposed tax changes hard on small producers

Drilling rigs are being laid down; employees laid off

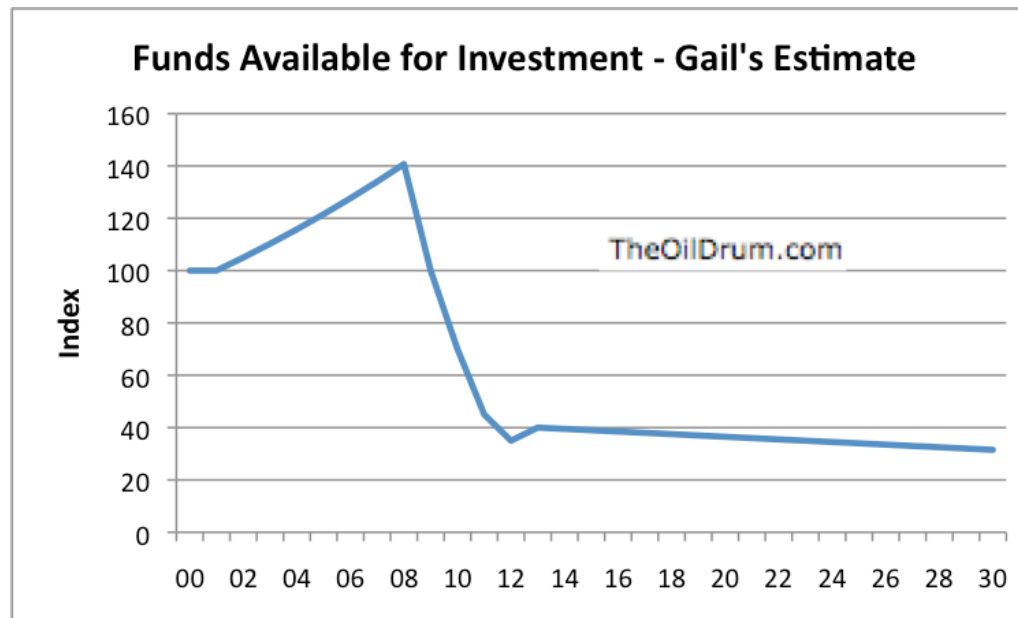


Real underlying problem is credit unwind

- Growth is needed to heal credit problems
- Growth is really no longer possible
 - If economy grows, we again hit oil price limits
- At best, we get oscillation
 - Price drop, demand growth, price spike, new crash
- At worst, whole financial system crashes
 - Currently more promises than underlying assets
 - May need to start over with a new system

Investment likely to stay low

- Credit unwind only part way finished
- No real reason for unwind to stop, if no growth



Long-term prospects

- “Good” scenario
 - Little credit
 - Little funds for investment
 - Fluctuating prices of raw materials
- “Bad” scenario
 - Major financial crash – new currency (?)
 - Rapid rise of protectionism
 - Difficult to carry on business

Planning for the future

- Cash is king
- Cash flow will be more important than discounted present value
- Expect little credit availability
 - High interest rates, if available
- Don't expect economic growth
- Emphasize local markets; long term relationships

How about electric cars?

- Production is still far in the distance
- Lots of obstacles
 - Funds for investment in factories
 - Funds to consumers to buy cars
 - Imports of lithium
- Best time to buy is probably now
 - Put together your own vehicle
 - Buy something very limited

Summary

- Peak oil is here now
- Peak natural gas will be here shortly
- Without these, the economy cannot grow
- Without growth, the economic system cannot function
- May need new non-debt financial system
 - At best, expect much less debt in the future
- Economic decline is likely in the future