



Finite Resources: One Possible Explanation for the Financial Crisis

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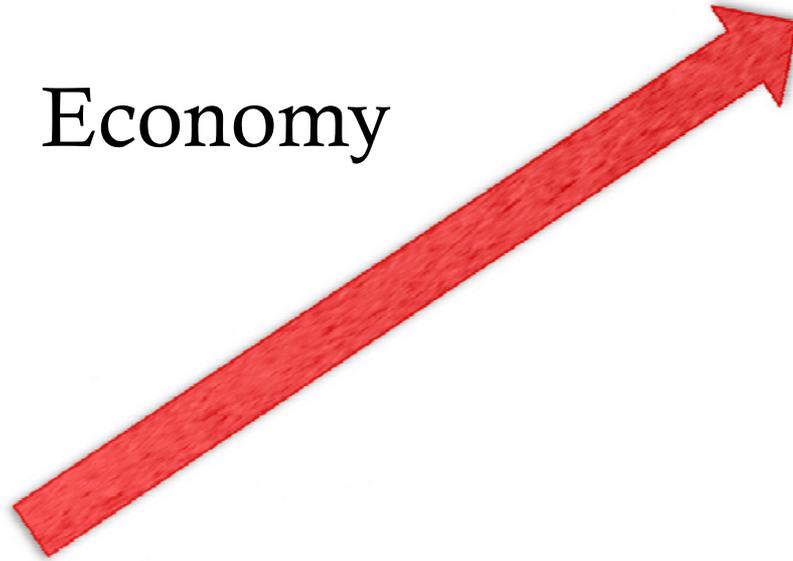
Outline

- Our one-way economy
- The energy stumbling block
- Credit unwind impacts
- Possible adverse scenario

Our One Way Economy:

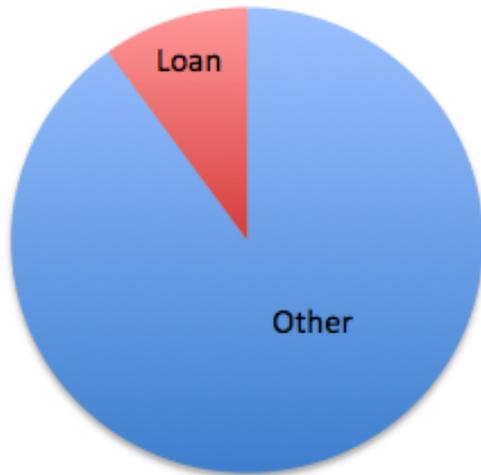
Our economy is designed to grow

Economy

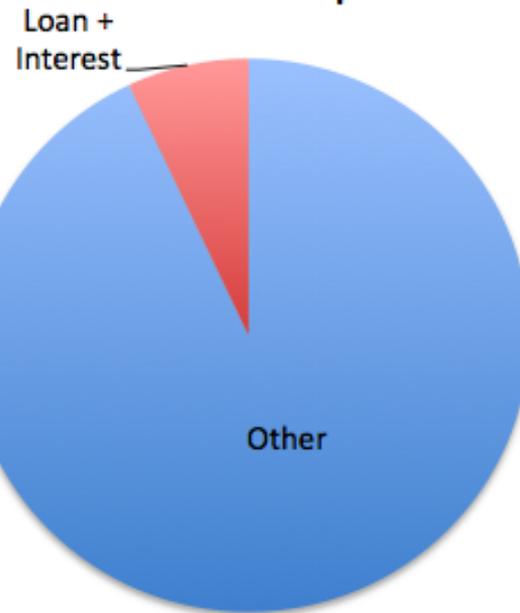


Repaying loans is easy in a growing economy

Loan as Originated

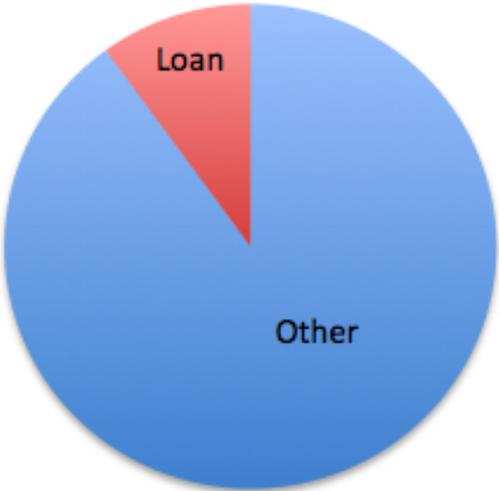


Loan as Repaid

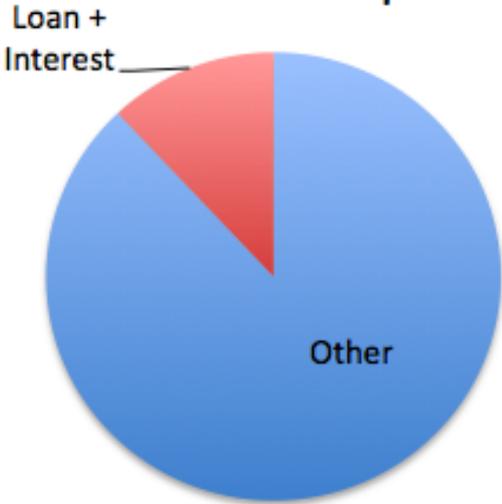


Repaying loans is much more difficult in a shrinking – or flat - economy

Loan as Originated



Loan as Repaid



A declining economy makes capital investment planning 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?

Declining property values are a problem in a declining economy

- Less demand -> lower prices
 - Home, commercial properties
- Refinancing becomes a problem
- Sales become a problem

Our financial system is networked
with the rest of the economy



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* allows us to avoid other limits

Cheap energy can't go on forever

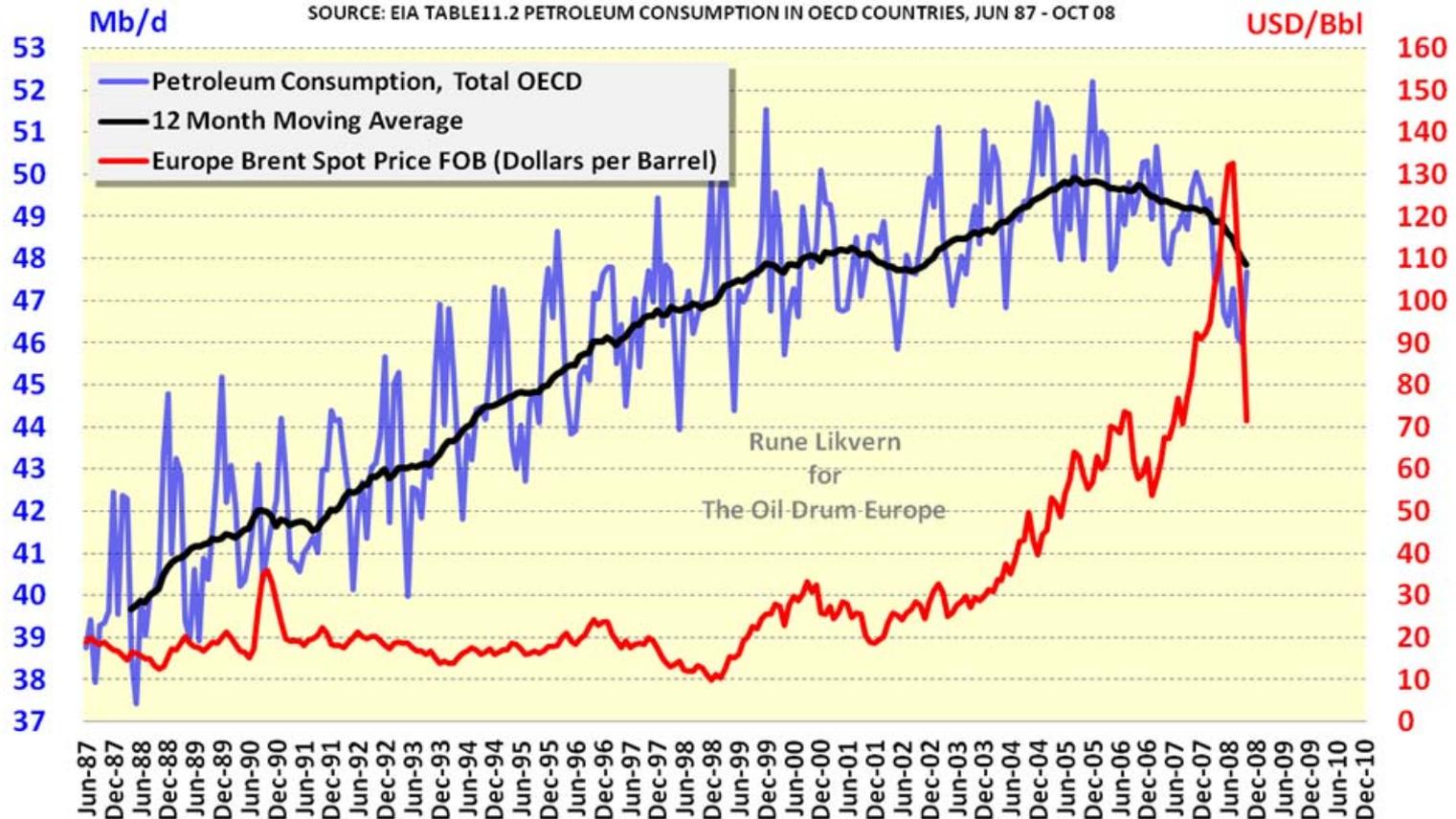
- We live in a finite world
 - Eventually the cheap energy gets used up
 - Need to move on to expensive, hard to extract energy



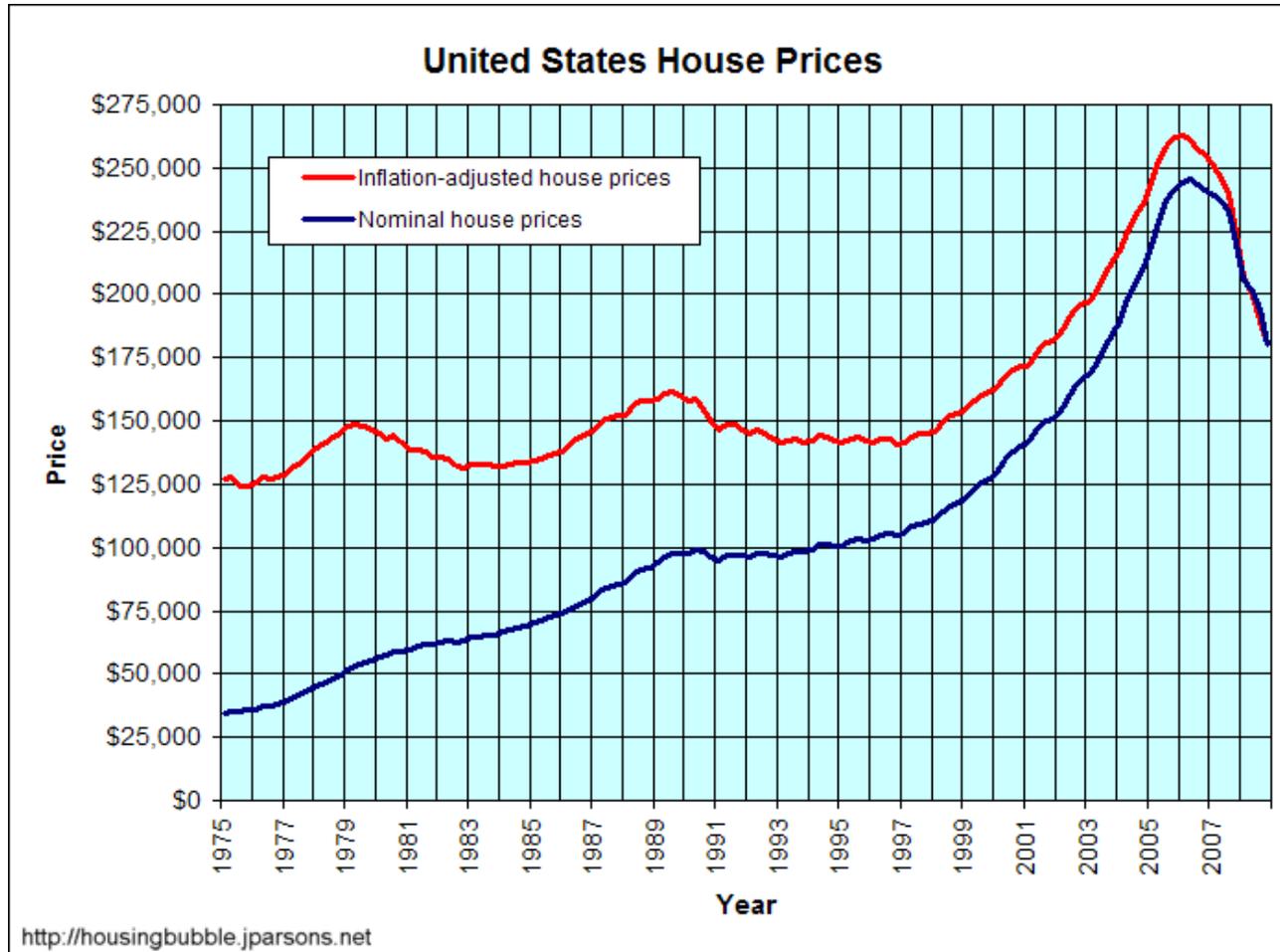
High energy prices began impacting consumption back in 2006

OECD TOTAL PETROLEUM CONSUMPTION vs OIL PRICES

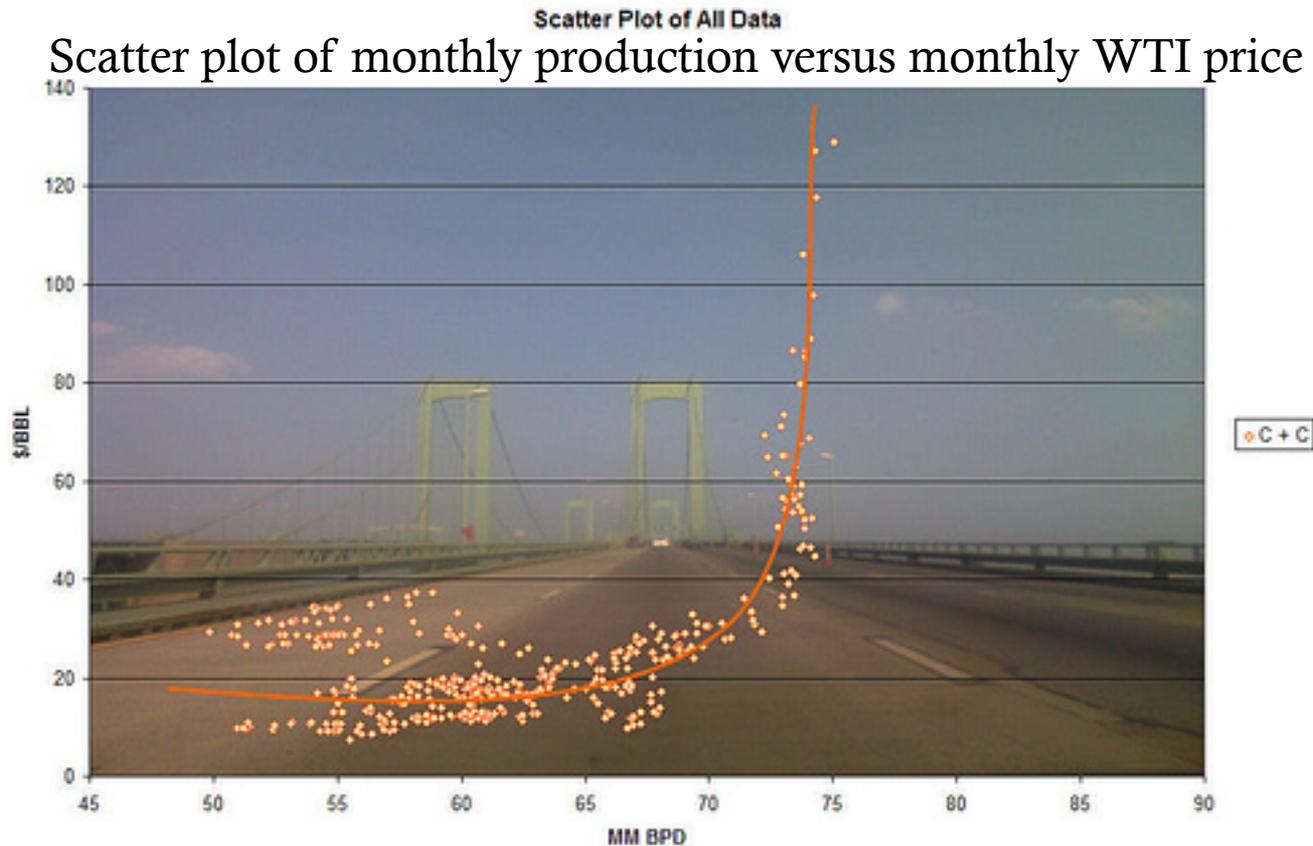
SOURCE: EIA TABLE 11.2 PETROLEUM CONSUMPTION IN OECD COUNTRIES, JUN 87 - OCT 08



About 2006, homeowners began having many more debt problems.



Prices kept rising, until a break came in July 2008



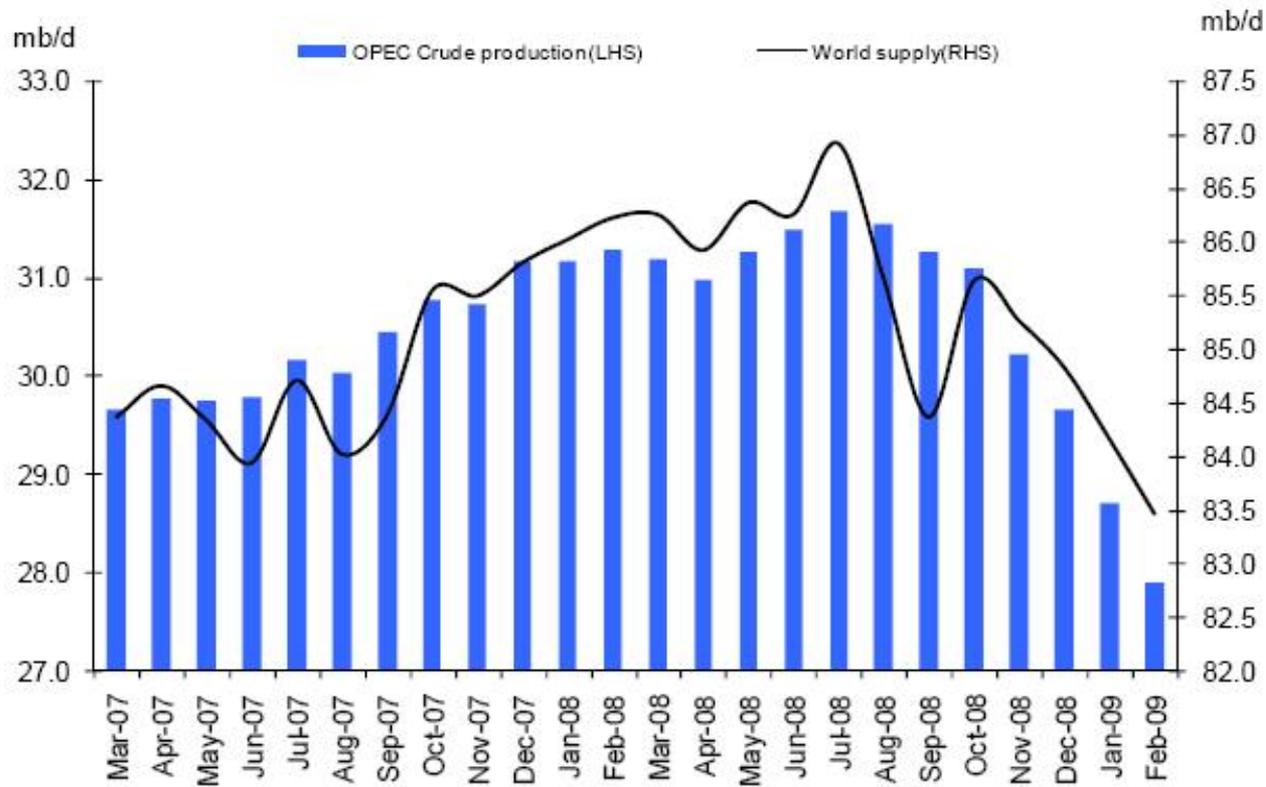
Graph by Starship Trooper, 12/8/2008, The Oil Drum

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

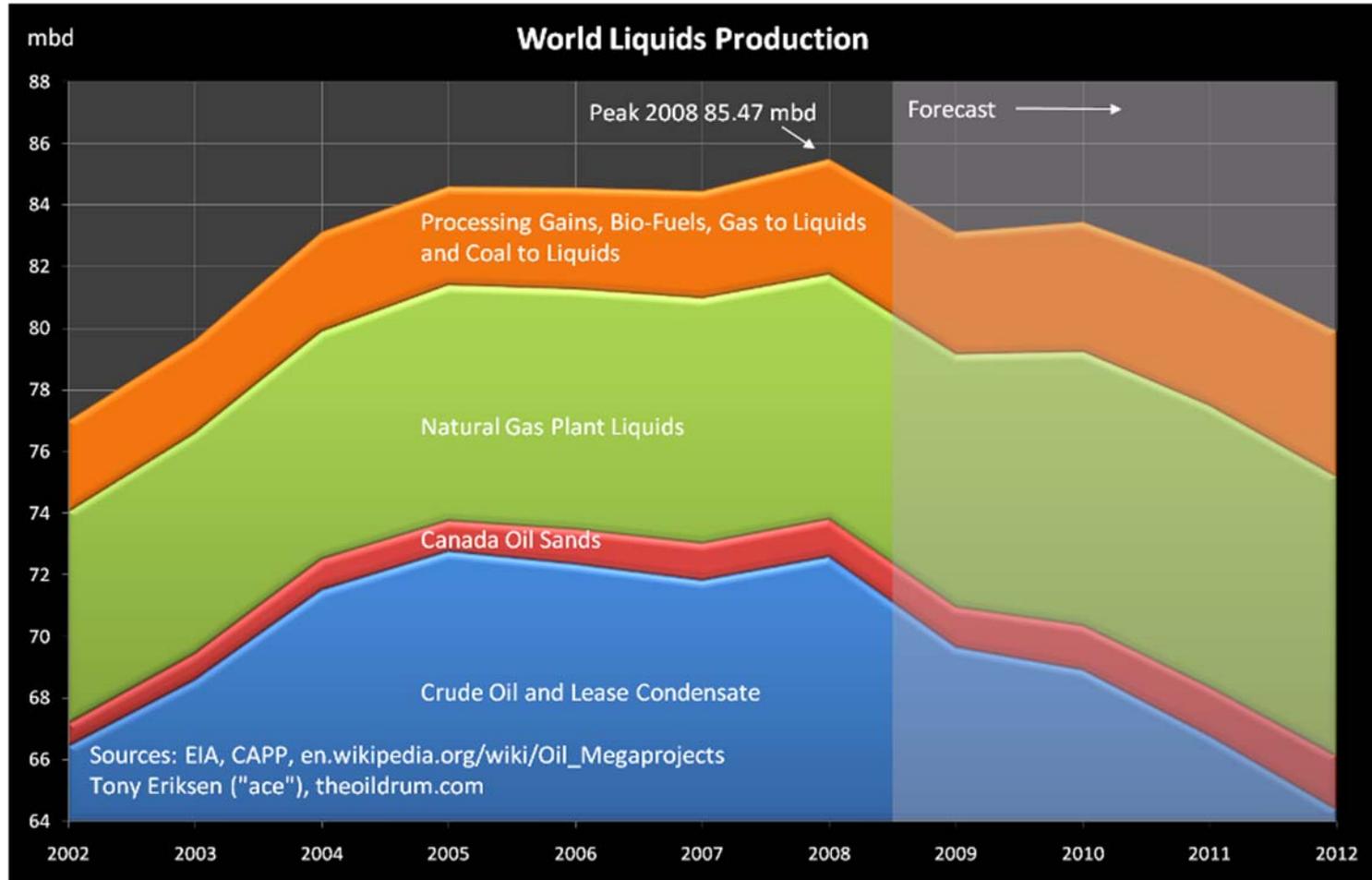
Now, it looks like world oil production is beginning to decline.

Graph 25: OPEC and World oil supply



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

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



Other energy sectors also affected

- Credit unwind is the overwhelming issue
- Nearly all sectors seriously impacted
 - Oil
 - Natural gas
 - Wind
 - Solar
 - Nuclear
- Coal would be the bright spot, except for climate change issues

Credit unwind impacts

- 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 seems available
Companies can't get to it!
(Low price, little funds to invest)

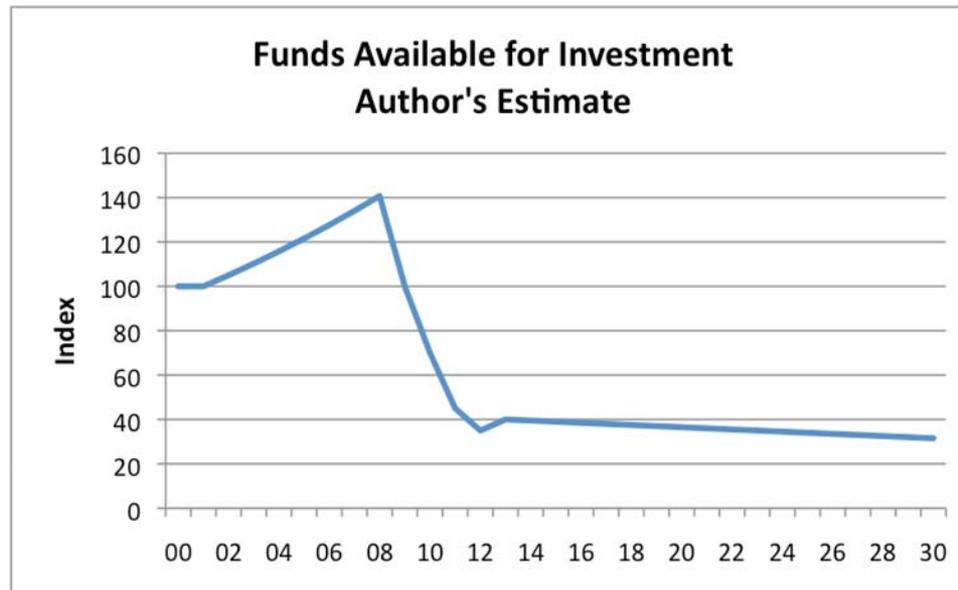
- Deep water oil
- Canadian oil sands
- Unconventional natural gas
- Wind
- Solar
- Ethanol
- Electric cars

Underlying problem: Need for growth colliding with finite resources

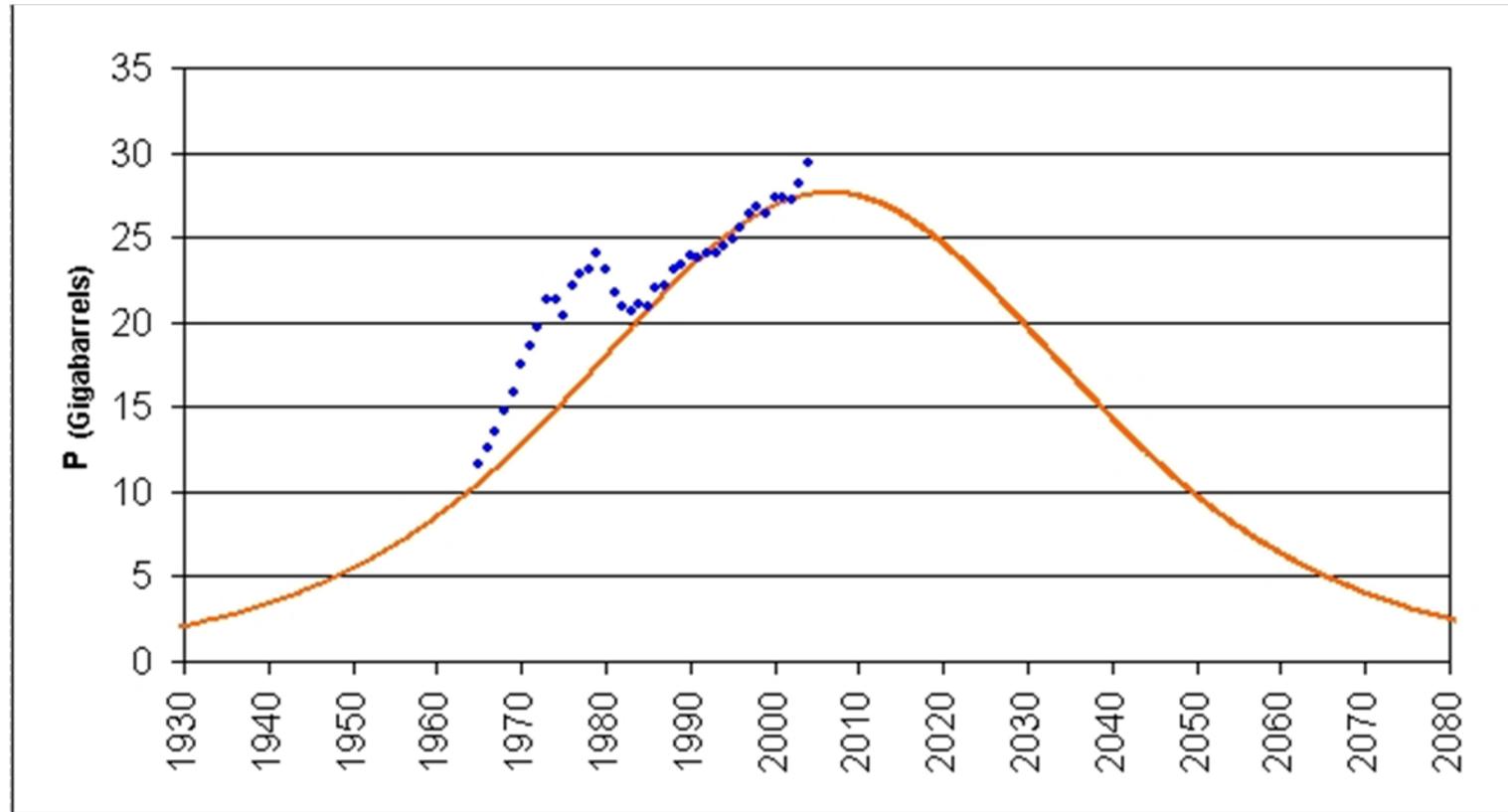
- Growth is needed to heal credit problems
- Growth is no longer possible
 - If economy grows, oil price limits are reached
- At best, system oscillates
 - Price drop, demand growth, price spike, new crash
- At worst, whole financial system crashes
 - Currently more promises than underlying assets
 - 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



Hubbert Curve View of Oil Production



Hubbert's Curve fitted to Data through 2004, Luis de Sousa, Wolf at the Door

Hubbert's Curve may be upper bound for future production

- Depends on investment
 - Investment depends on credit
 - Credit likely decreasing
- Major financial crash possible
 - Disrupt international trade
 - Big drop in production likely

Adverse Oil Production Scenario

