



## Finite Resources: One Possible Explanation for the Financial Crisis

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# Outline

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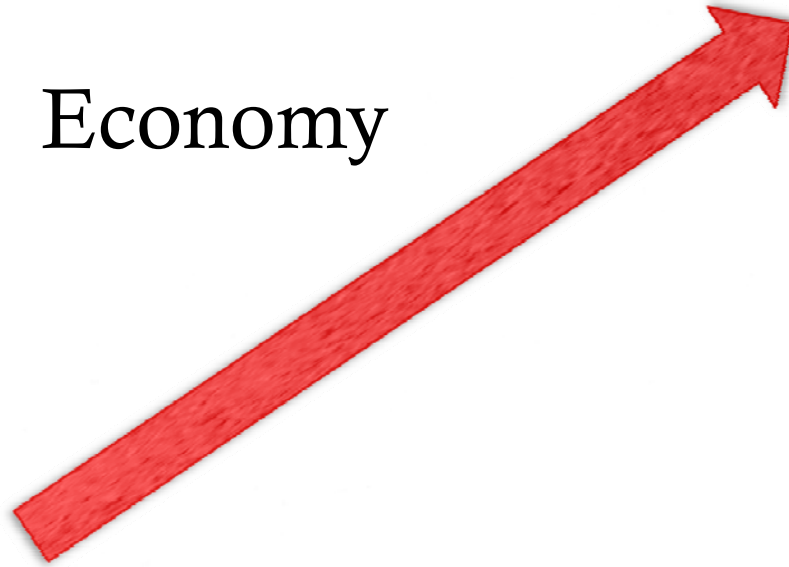
- Our one-way economy
- The energy stumbling block
- Credit unwind impacts
- Possible adverse scenario

# Our One Way Economy:

Our economy is designed to grow

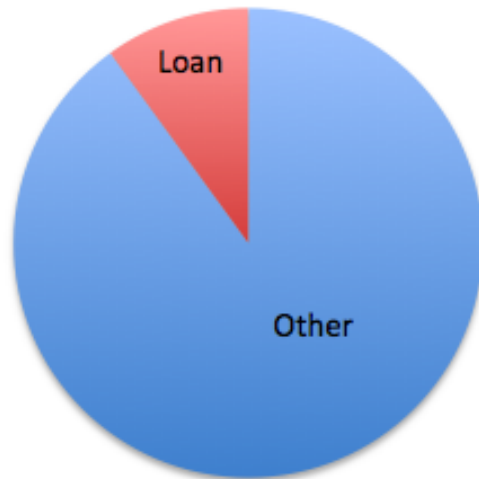
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Economy

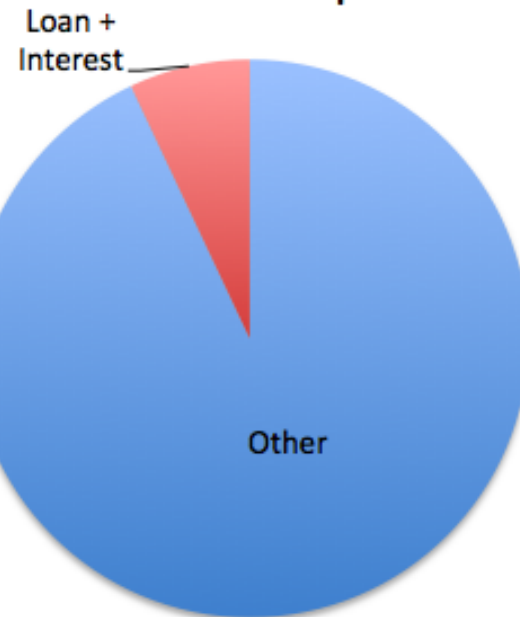


# Repaying loans is easy in a growing economy

Loan as Originated

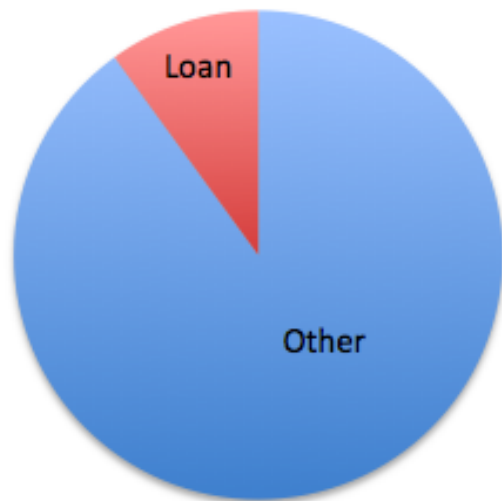


Loan as Repaid

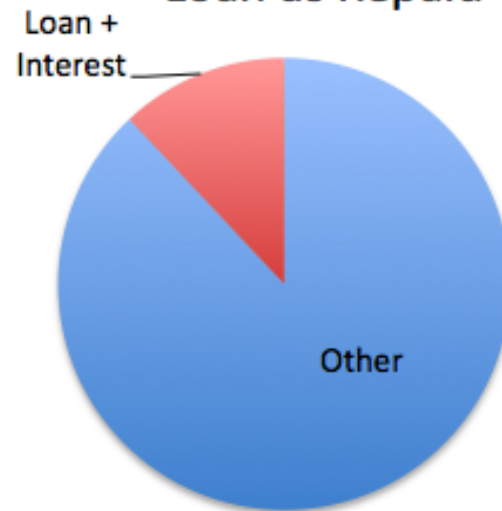


# Repaying loans is much more difficult in a shrinking – or flat - economy

Loan as Originated



Loan as Repaid



# A declining economy makes capital investment planning difficult

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- 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

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- 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

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# The Energy Stumbling Block

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- *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

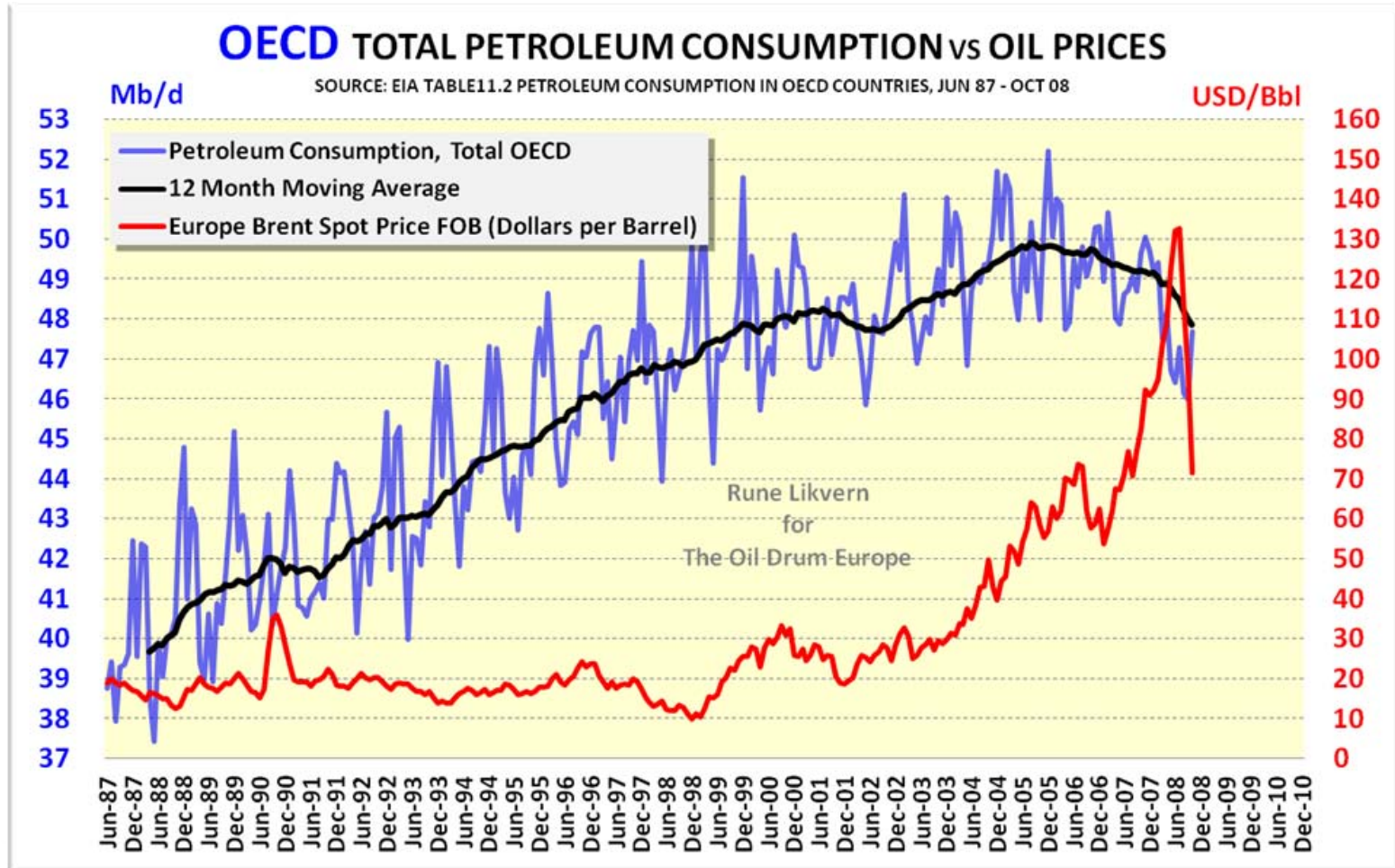
# Cheap energy can't go on forever

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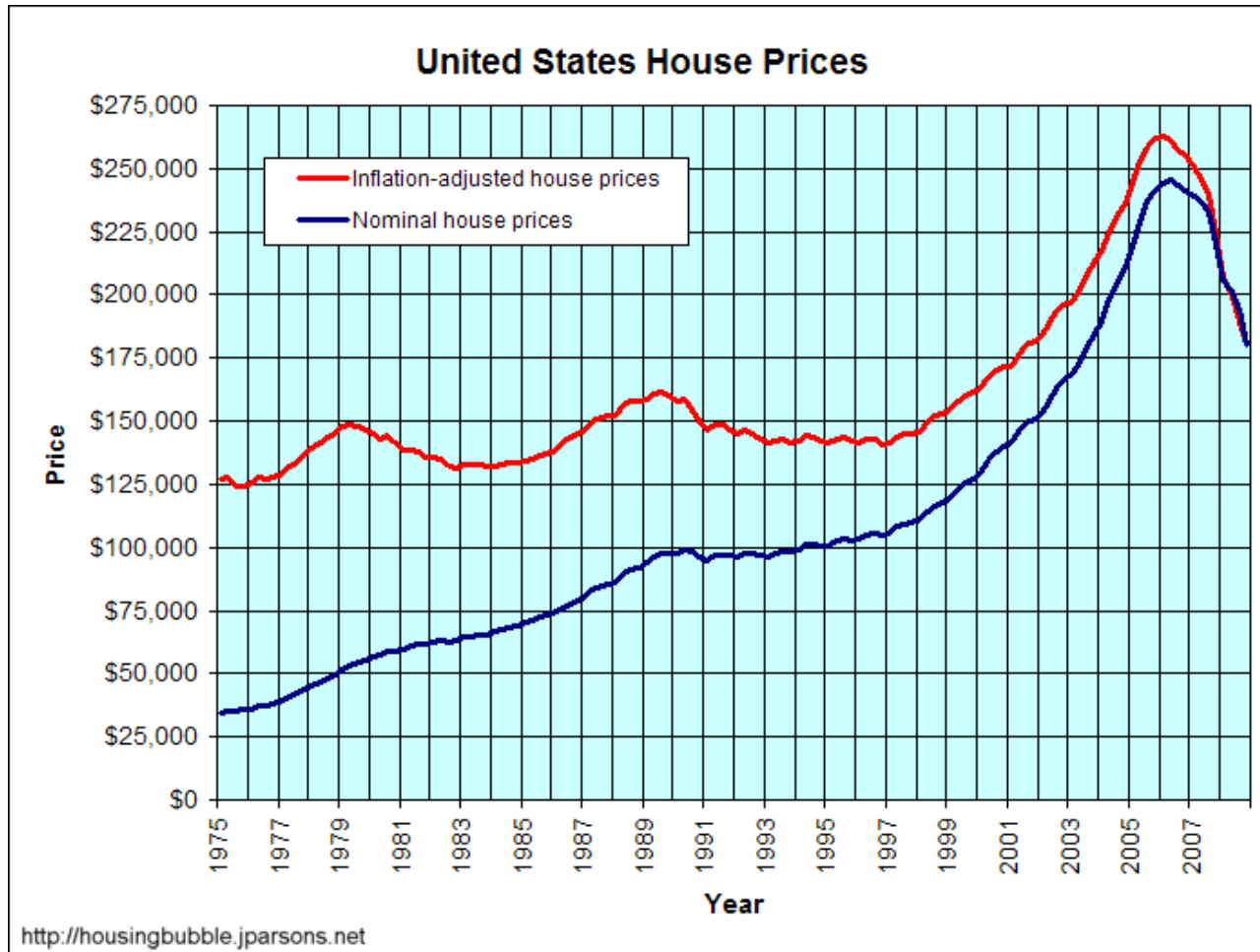
- We live in a finite world
  - Eventually the cheap energy gets used up
  - Need to move on to expensive, hard to extract energy



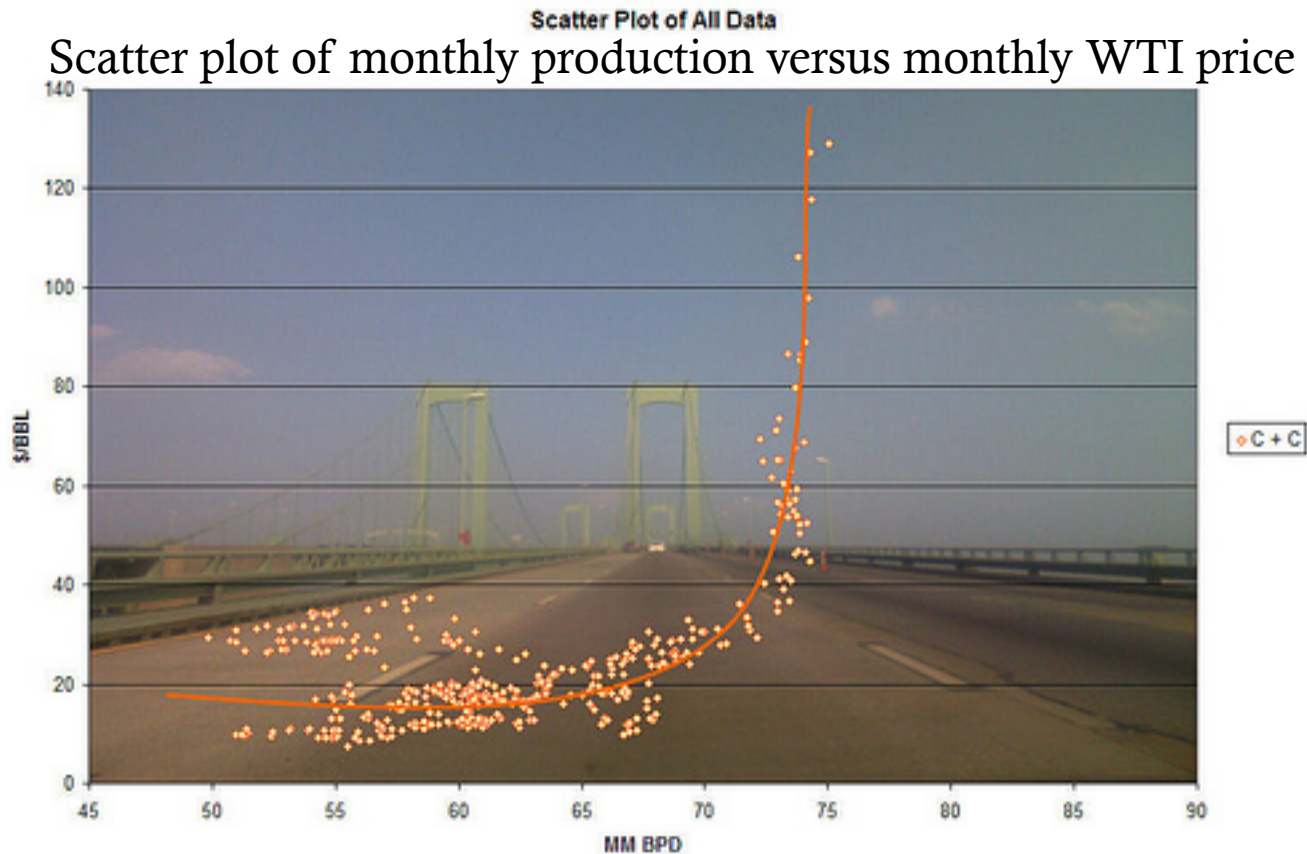
# High energy prices began impacting consumption back in 2006



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

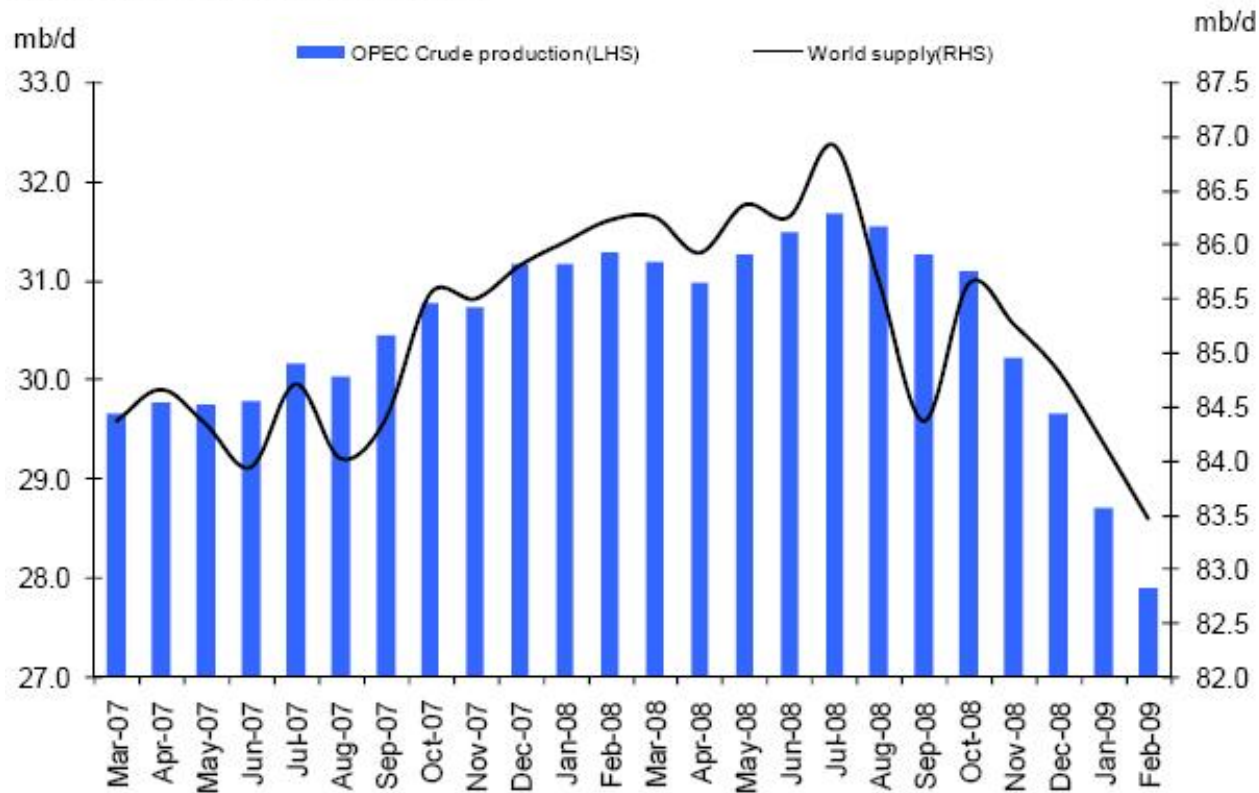
High oil prices -> General credit unwind  
-> Drop in demand -> Low oil prices

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- 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.

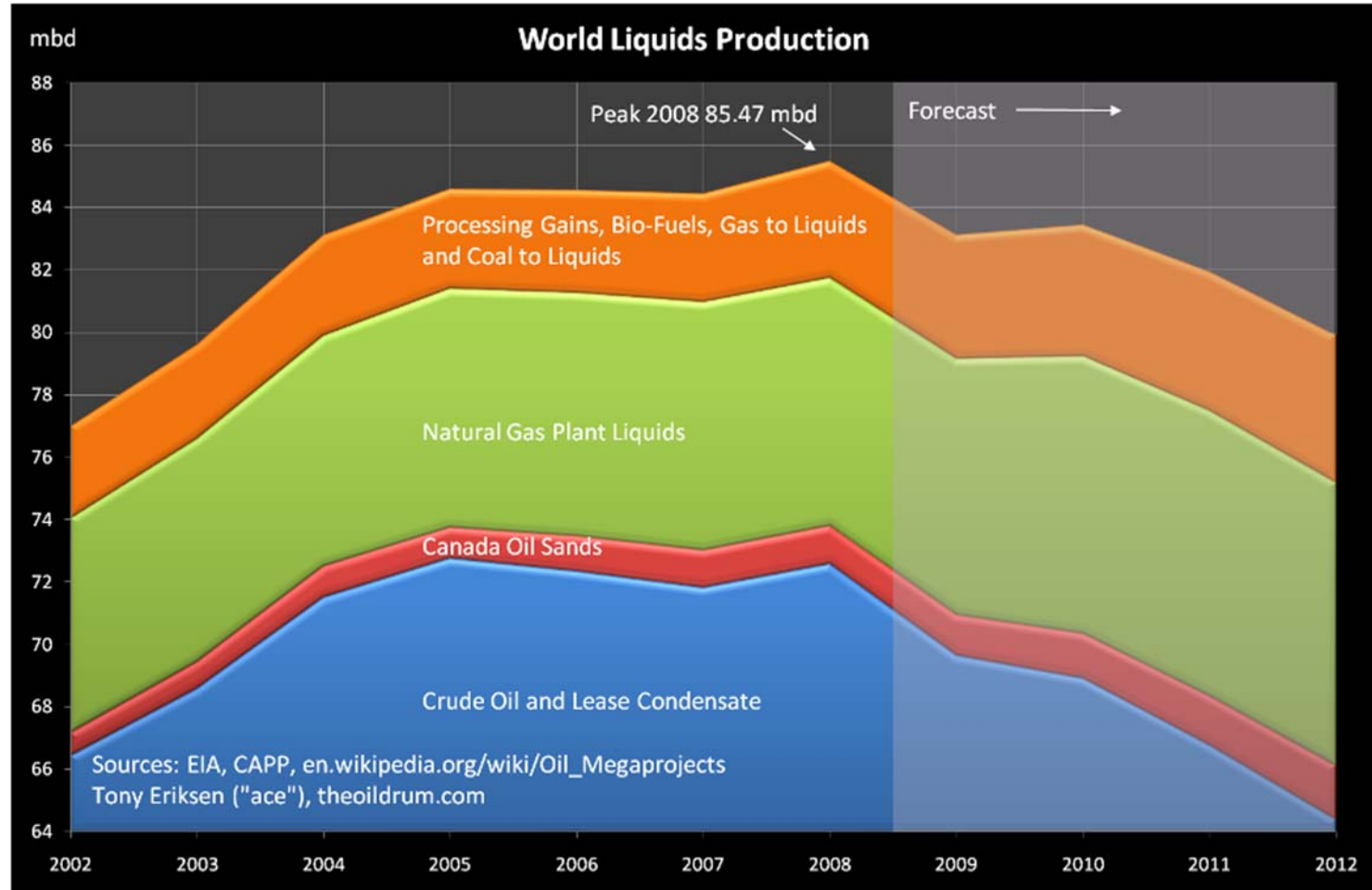
Graph 25: OPEC and World oil supply



<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

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- 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

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- 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)

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

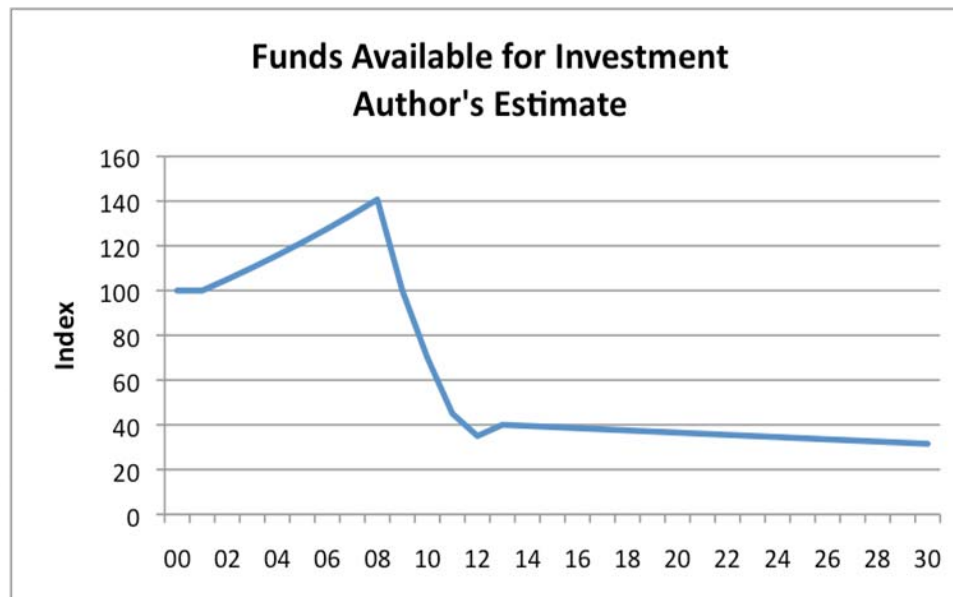
# Underlying problem: Need for growth colliding with finite resources

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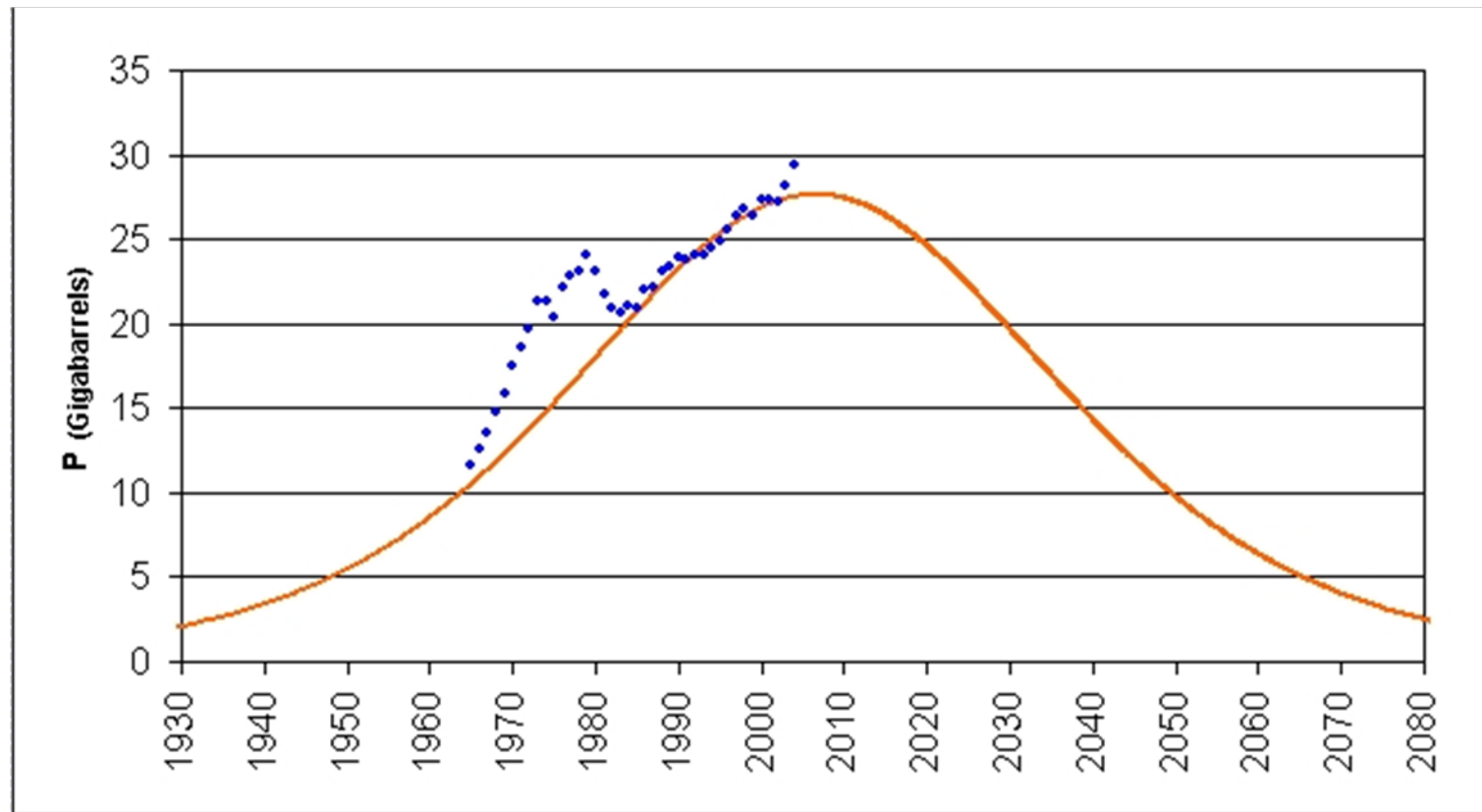
- Growth is needed to heal credit problems
- Growth is no longer possible
  - If economy grows, oil price limits are reached
- At best, system oscillates
  - Price drop, demand growth, price spike, new crash
- At worst, whole financial system crashes
  - Currently more promises than underlying assets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

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- 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

