Peak Oil Overview - March ‘08

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Outline

• The US oil story
• The world oil story
• Five myths
The US Oil Story
The US Oil Story

Oil Production for US 48 States Reached a Peak in 1970

Source: US Energy Information Administration
US Peak in 1970

- US had been world’s largest producer
- Peak came as a surprise to most
  - Had been predicted by Hubbert in 1956
- Precipitated a rush to find oil elsewhere
  - Ramp up Saudi and Mexico production
  - New production in Alaska and North Sea
Saudi increases were quickest

• Saudi oil company was run by Americans
  – Able to ramp up quickly
• OPEC embargo in 1973, however
  – Oil shortages
  – Huge oil price run-ups
  – Lead to major recession 1973 - 75
Other oil online by late 1970s
Now the US is a major importer of oil and tiny user of newer renewables.

Chart 7-1  U.S. Energy Consumption and Production (2006)
Fossil fuels accounted for the majority of U.S. energy consumption and production in 2006.

- Petroleum: 40%
- Coal: 23%
- Natural Gas: 22%
- Renewables: 7%
- Nuclear: 8%

Total Consumption: 100 Quadrillion Btus
Total Production: 71 Quadrillion Btus

Source: Department of Energy (Energy Information Administration).
Reading the slide:

• About two thirds of oil is imported
• Biofuels make up about 1.0% of energy production - a little less of use
• Wind comprises 0.4% of energy production
• Solar comprises 0.1% of energy production
The World Oil Story
World Oil: Discoveries follow same pattern as US production

Oil discoveries have been declining since 1964

10-Year Discovery in Billions of Barrels

Note: World oil discovery over 10-year periods, by Association for the Study of Peak Oil and Gas.
World oil production has stalled
And Prices are Spiking

Price per Barrel of West Texas Intermediate

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Source: US Energy Information Administration
OPEC, particularly Saudi Arabia, has had reduced oil production recently.
OPEC’s true reserves are unknown

- Published reserves are unaudited
- Last Saudi reserve while US involved was 110 Gb in 1979 (perhaps 168 at “expected”)
  - Production to date 81 Gb, implying 29 to 87 Gb remaining; Saudi claims 264 Gb remaining
- Kuwait published 96.5 Gb - Audit 24Gb
- GW Bush says regarding asking Saudi Arabia for more oil
  - “It is hard to ask them to do something they may not be able to do.”
Fortunately, FSU production has increased recently.
Production going forward is uncertain

- OPEC refuses to increase quotas
- Numerous reports say Russian production is likely to begin decreasing soon
- Little hope for US, North Sea, Mexico
- Canadian oil sands contribution is very small
- Recent discoveries have been small, relative to what is needed
- New production techniques can lead to sudden drop-offs
  - Followed by small dribble for years from EOR
Projections of Future Production Vary Widely
World “All Liquids” Forecasts

• “All Liquids” - Includes biofuels and “coal to liquid” fuels
• US EIA forecast - Based solely on demand
• ASPO Newsletter - Assoc. for the Study of Peak Oil and Gas Ireland, March ‘08
• “Ace”- Tony Eriksen, on The Oil Drum
• Simmons - Matt Simmons, recent interview on evworld.com
EIA expects biofuels, CTL, and oil sands to remain small
Five Myths
Myth #1: OPEC could produce more if it used current techniques

- International oil companies use the same service companies US companies do
- Most are using up-to-date techniques
- Expenditures often are high
- Problem is very old fields
- Overstated reserves raise expectations
Myth #2: Drilling in Arctic National Wildlife Refuge will save us
Myth #3: A small downturn can easily be made up with energy efficiency

- The quickest impacts are financial
  - Recession or depression
  - Serious recession in 1973 - 75

- Use of biofuels raises food prices
  - Further increases recession risk

- Don’t need peak for recession
  - Only need supply/demand shortfall
  - Likely what we are experiencing now
Myth #4: Canadian oil sands will save us

• Hard to see this with current technology
  – Technology known since 1920s
  – Production slow and expensive

• Requires huge amount of natural gas
  – In limited supply

• Most optimistic forecasts equal 5% of current world oil by 2030
  – Even this exceeds available natural gas
Myth #5: Biofuels will save us

- Corn-based ethanol has many problems
  - Raises food prices, not scalable, CO2 issues, depletes water supply
- Cellulosic ethanol theoretically better
  - Still does not scale to more than 20% of need
  - Competes with biomass for electric, home heat
- Biofuel from algae might work
  - Not perfected yet