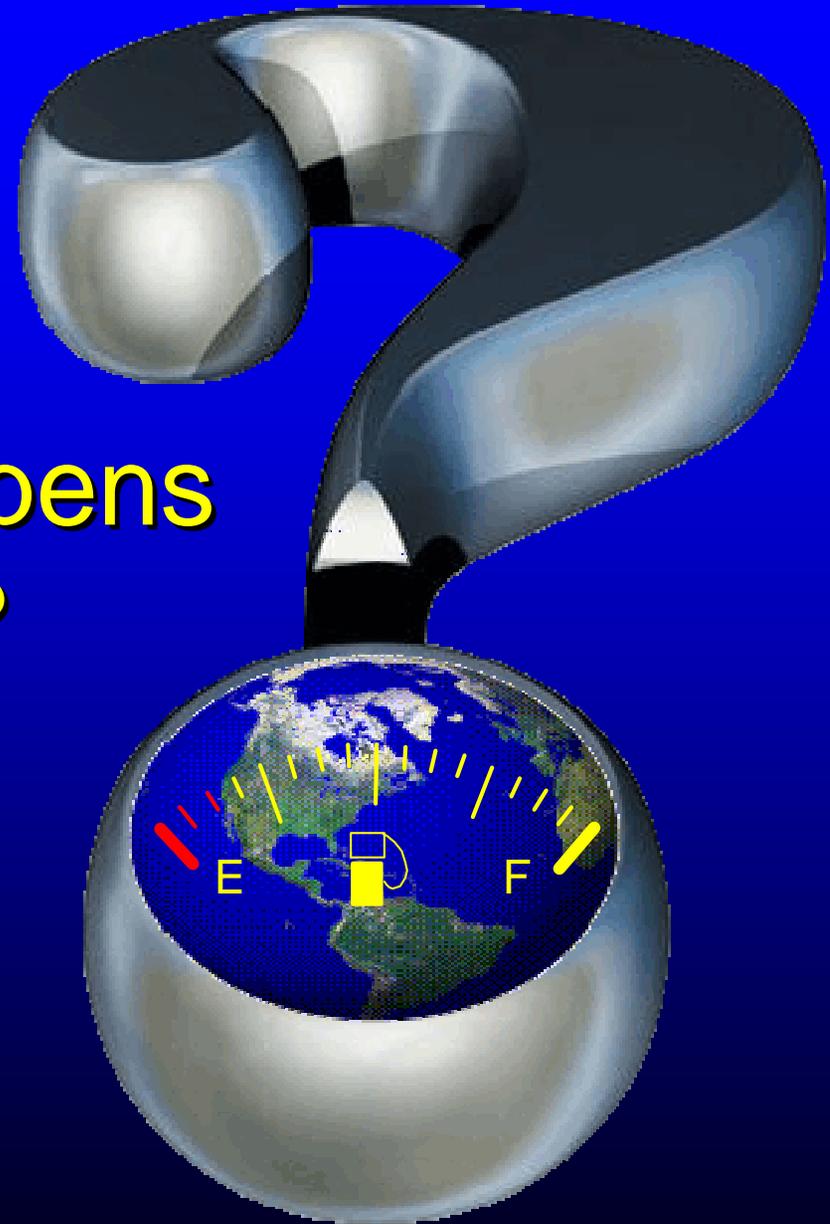


Plan B: What Happens After Peak Oil?

Society Of Exploration Geologists
TLE Forum
Denver, Colorado
October 11, 2004

Presented By:
Matthew R. Simmons



Peak Oil Is A Certainty

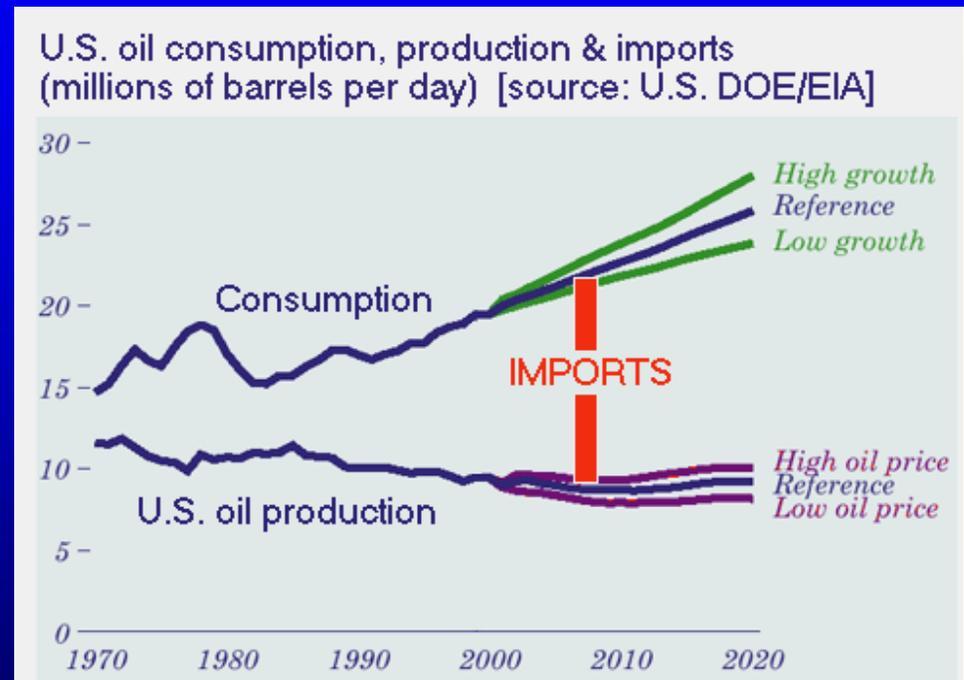
- Timing peak oil's arrival is a guessing game.
 - Its occurrence is NOT!
 - Diagnostic tool: “a rearview mirror”.
 - Peaking of oil does not mean “we ran out!”
- 

Why People Disregard The Peak Oil Issue

- “Oil has never run out.” (Crying wolf is an old game.)
- Great new discoveries “must be around the corner”.
- Proven oil reserves (1.2 trillion barrels) equates to 40 years current use.
- Oil sands and other unconventional oil wait in the wings.
- High oil prices will likely create new oil supplies.

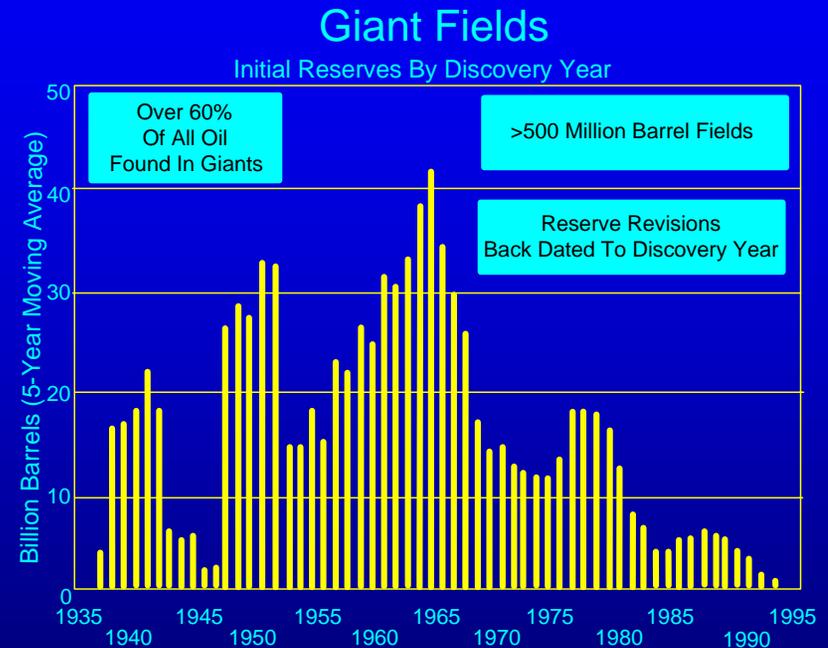
Oil Peaking Is Probably “At Hand”

- Current oil supply is “long in the tooth”.
- Oil Demand is becoming a runaway train.
- The higher demand soars, the sooner Peak Oil will arrive.
- Concept that Peak Oil is supply driven is false.
- Demand plays an equally important role.



Why Supply Is Old

- 70% of daily oil supply now comes from oilfields “on production” for 30 years or more.
- 20% of global supply comes from 14 giant oilfields whose average age is over 50 years.
- A growing number of key production regions have passed Peak Oil supply.
- Modern technology drains oil faster.
- Global decline rates are soaring.

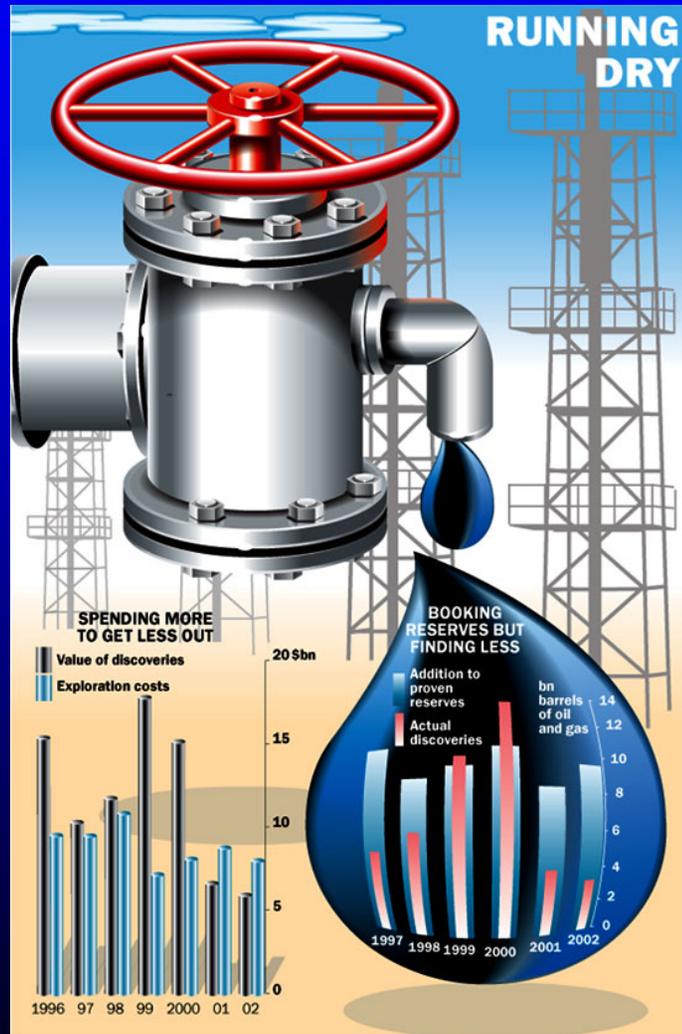


Oil Demand Is The Killer Issue

- Oil demand became “a runaway train”.
- Growth in the next 3 months is estimated to total 2.4 million barrels per day.
- Growth in next 15 months is estimated to total 4.3 million barrels per day.
- By fourth-quarter 2005, world could demand almost 86 million barrels of oil per day.
- In early 1990s, most oil experts thought demand was permanently stuck at 66 million barrels per day.

DEMAND!

Proven Reserves Do Not Correlate To Peak Oil

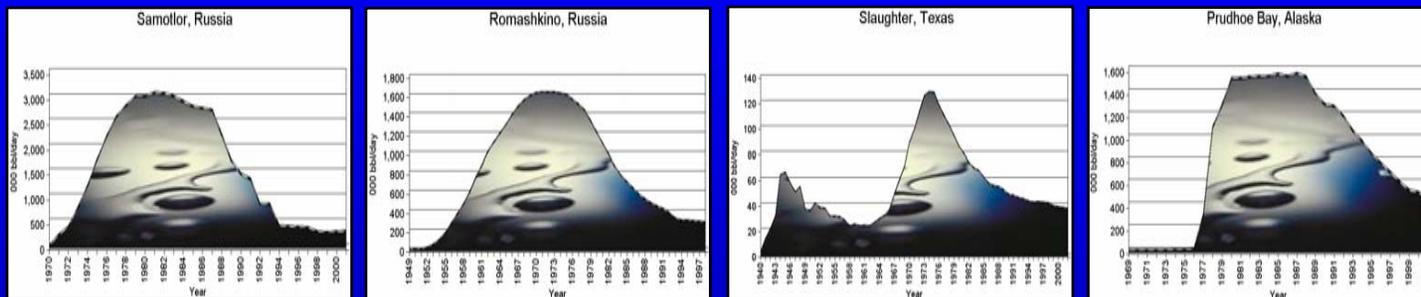


- Having ample estimated proven reserves does not mean production will not decline.
- A significant amount of stated proven reserves would never pass third-party SEC standards.
- Concept of Reserve Appreciation is also an obsolete theory.

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Source: London Times, January 26, 2004.

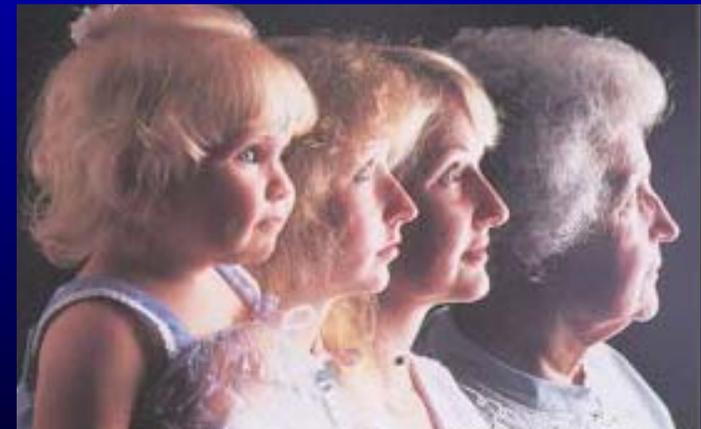
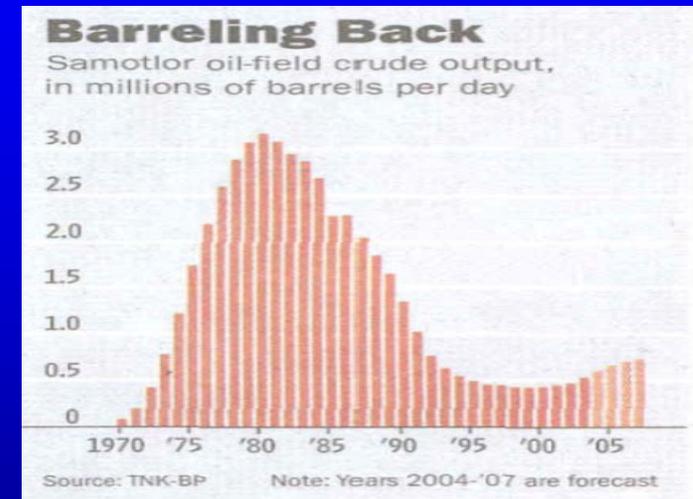
“Rate Sensitivity” Of Oil Production Is A Mysterious Issue



- The faster most oilfields are produced, the quicker high flow rates end.
- Overproducing most reservoirs also bypasses otherwise easily producible oil.
- Some “critical supply kegs” are now being overproduced.
- If these same fields reduced production, a steady output could be more easily maintained.

Once Oil Supply Peaks, What Is Next?

- Peaking could have a plateau.
- Field case studies argue post-peaking creates sharp declines.
- Once production falls by 75 to 90%, remaining tail flattens.
- Technology helps to capture “oil left behind”.
- Oilfield life extending techniques analogous to modern human health.
 - Quality of life before old age is better and cheaper.
 - Quality of life after old age deteriorates.
 - Quality of life beyond 100?



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There Is No “Plan B” Once Peak Oil Arrives

- Since few energy planners believe Peak Oil is real, no plans have been made for “what is next”.
- Creating “Plan B” is critical: Why?
- World is planning on oil demand soaring.
 - USA
 - China
 - India
 - Middle East
 - Bangladesh



A Genuine “Plan B” Is Still A Mystery

- Creating an energy substitute for oil’s finished products sufficient to continue demand growth and supply decline is daunting.
 - Just dealing with planned 4.3 million barrels of oil per day growth in 15-month plus decline of 5% requires 8+ million barrels of oil per day of new energy.
 - This is equivalent to a new Saudi Arabia.
- None of current alternative energy sources can currently bridge this gap.
 - Coal
 - Natural Gas
 - Nuclear
 - Renewables

Each have unique limits.

The “Limits To Other Energy Growth”

- Coal is most abundant, but:
 - Creates electricity.
 - Is energy inefficient.
 - Is “high emission prone”.
- Natural gas is best fallback, but:
 - Its supply is shaky.
 - Its demand projections far outpace oil.
 - It is not a substitute for 80 to 90% of oil use.
- Nuclear: impossible and probably uranium constrained.
- Hydro: out of good sites and only electricity created.
- “The renewables”: impractical, nondispatchable, nonsubstitutable for oil.



Getting To A Real “Plan B” Will Take Time And Money

- The last “new energy” source took 50+ years to commercialize.
- The blackboard of possible candidates is complex:
 - Hydrates
 - Water energy
 - Space energy
 - Center of earth energy
 - Bacteria energy
 - Etcetera (if there are any others).



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Energy Bridges Are The Real “Plan B”

- Creating a genuine substitute for what oil should have been might not work and might take decades.
- Meanwhile, hundreds of tiny steps create bridges to buy time.
- The list of bridges is long.
- “THERE IS NO BAD FORM OF ENERGY”
- Nonconventional oil must play a role.
- Energy efficient technology must boom.
- Major conservation breakthroughs urgent.
- Creating an environmental/energy peace treaty critical.
- Access to all banned drilling areas crucial.

“It Will Not Make A Big Difference” Is Bad Thinking

- Many energy bridges will not make a big difference.
 - Some are like making rivets in World War II.
 - Others must lead to something bigger.
 - All need to be pursued.
- Some have higher immediate priorities.
 - Access to USA Outer Continental Shelf.
 - Mapping/test drilling all other “mystery areas”.
 - Greenland.
 - Arctic/Antarctic.
 - All deepwater.



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Avoid Creating More “Shovels”

- Rule #1 when you find yourself in a deep hole:
 - “STOP DIGGING!”
- Some possible “solutions” could accelerate the depth of the hole.
 - Avoid “energy intensive” solutions if possible.
 - Measure energy cost to create next technologies.
 - Watch water needs as it is also becoming scarce.

It Is Time For A Wake-up Call

- Energy complacency reminds me of 1859 and 1939.
- This problem ranks alongside thermonuclear war.
- Unless it is solved:
 - Globalization ends.
 - Usable potable water ends.
 - Food productivity dwindles.
 - Transportation goes back to wind and foot power.
- High energy prices are a blessing.
- A shock will hopefully wake us up.



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Could The Shock Be “At Hand”?

- Oil demand by December is supposed to rise by 2.4 million barrels of oil per day.
- Non-FSU/Non-OPEC supply has been flat for five years.
- FSU oil has limited spare export capacity.
- Only Saudi Arabia might have any oil spare capacity.
- Using it might exacerbate the possible overproduction of its small handful of giant fields.
- A wall might be just ahead!

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