

Biofuels and National Security

*Practical Choice
Or Wishful Thinking?*

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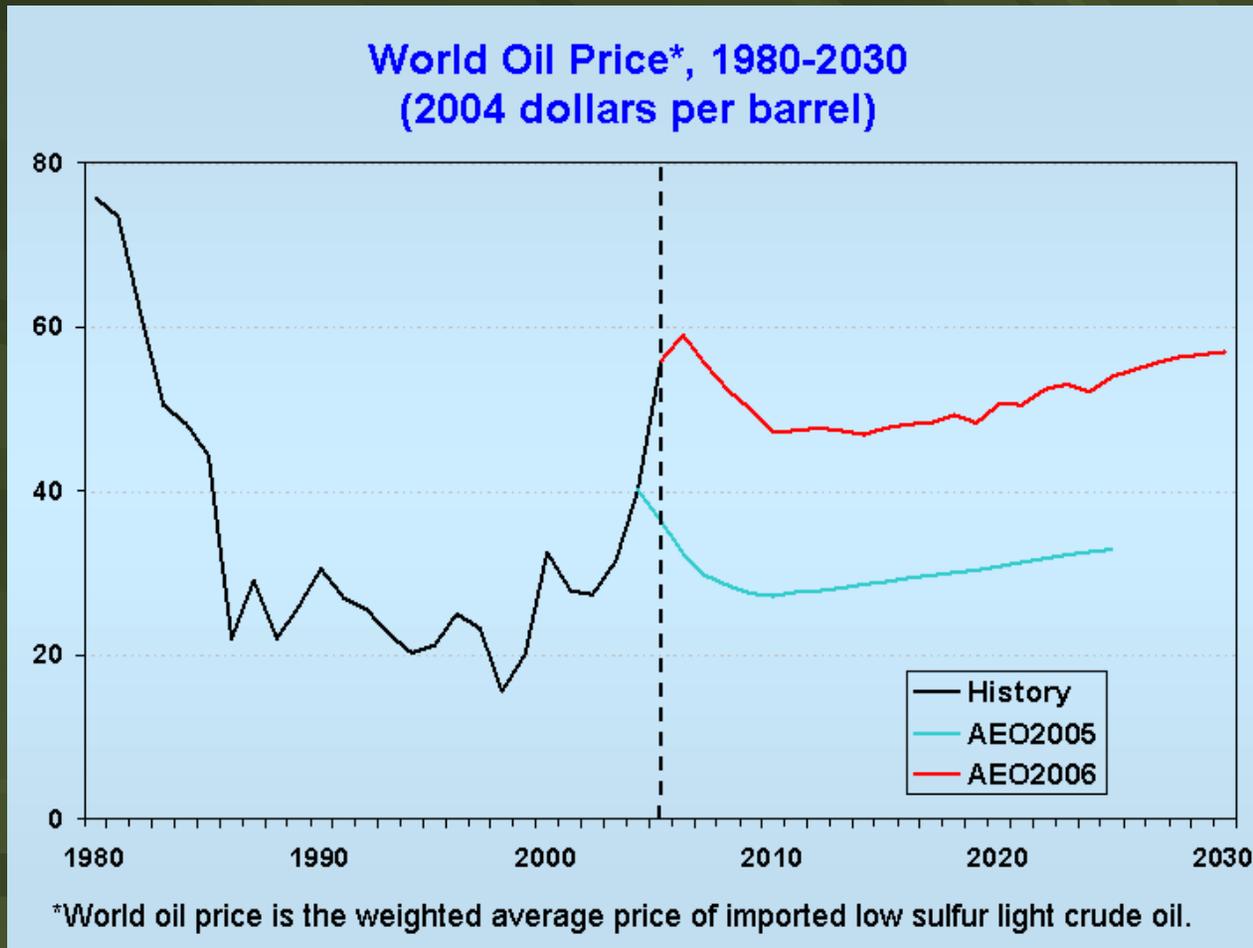
Energy Future Coalition

- Broad-based, non-partisan, foundation-supported public policy initiative
 - Tim Wirth, Boyden Gray, John Podesta
 - Business, labor, environmental leaders
 - Key issues: climate, security, access
 - Politically realistic policy options
 - June 2003: Challenge and Opportunity
 - 25x'25
- PDAS, EERE, Bush 41

Energy Future Coalition

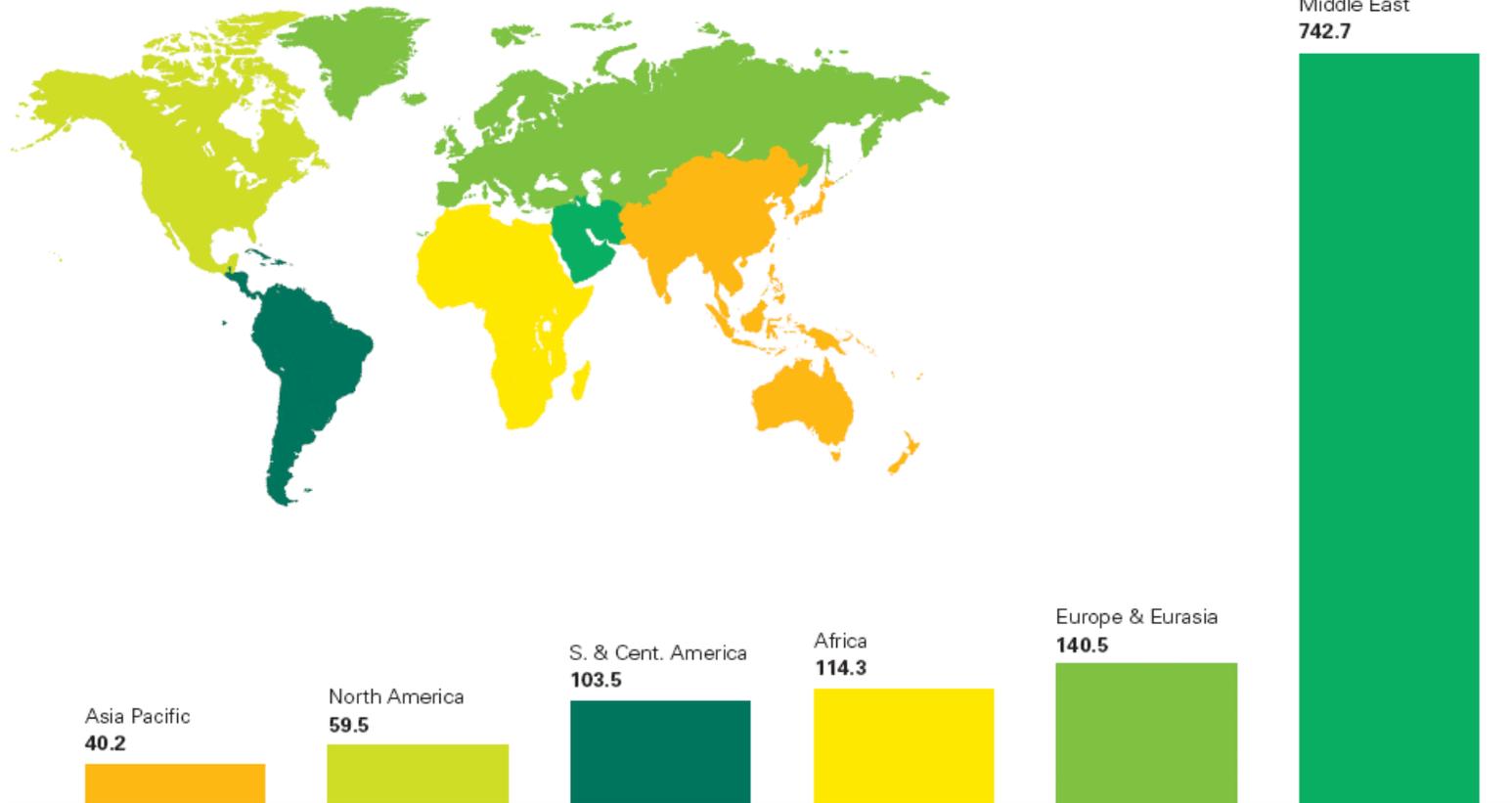
- Two drivers of “disruptive change”:
 - Insecurity and size of world oil resources
 - Increasing risk of climate change
- Threats or opportunities?
- Costs have been exaggerated, benefits underestimated
 - Technological innovation
 - Economic growth and job creation
 - Public health and environment

Reviewing the Problem



Reviewing the Problem

Proved reserves at end 2005
Thousand million barrels



Reviewing the Problem

- “Keeping America competitive requires affordable energy. And here we have a serious problem: America is addicted to oil, which is often imported from unstable parts of the world.”

– *President George W. Bush*

What is a Realistic Goal?

- Energy Independence

- Self-Sufficiency is Not Practical

OR

- Political Independence

- Freedom from Political or Economic Blackmail

What is a Realistic Goal?

- Achievable:

- Flexibility and Competition
- Diversity of Supply

- “Safety and certainty in oil lie in variety and variety alone.”

– *Winston Churchill, 1915*

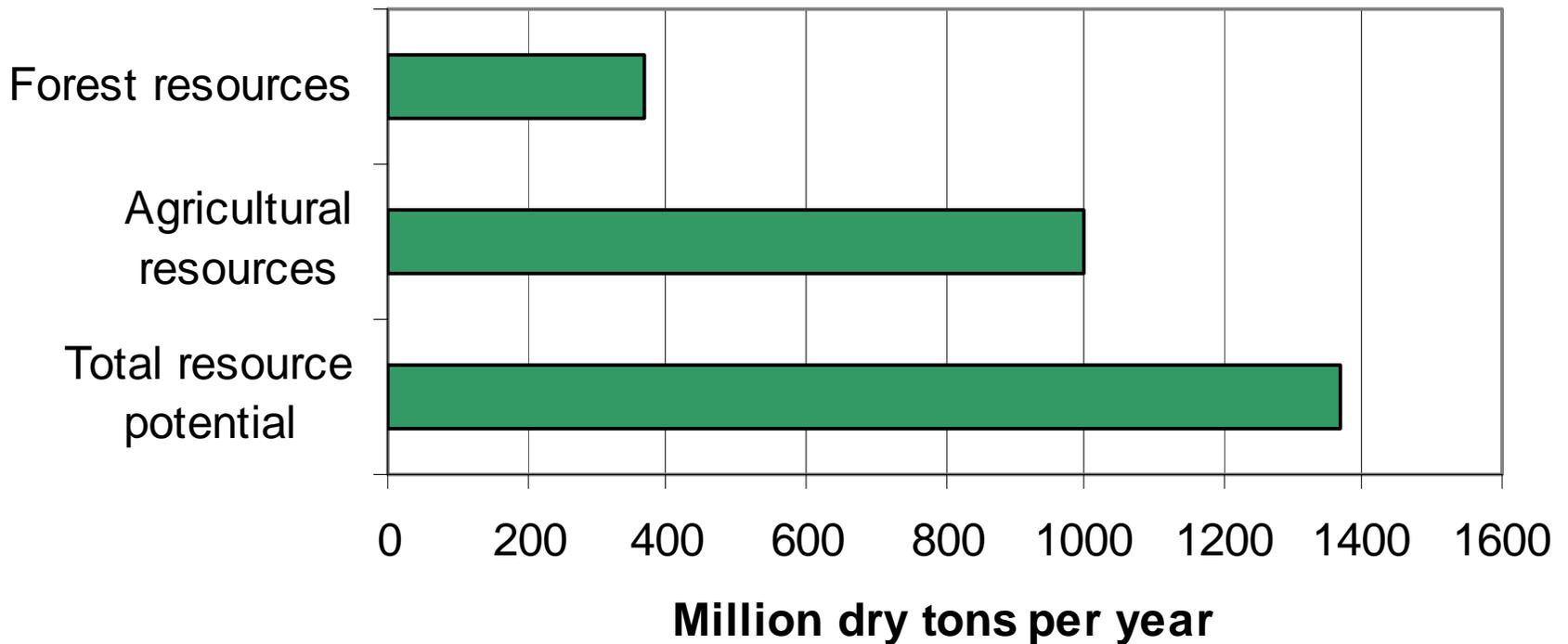
What Can Biofuels Deliver?

- Current production: 4 billion gallons
- Renewable Fuel Standard: 7.5 bil. by 2012
- Corn potential: 15-20 billion gallons

- Target: 140 billion gallons of gasoline
- Ethanol has only 2/3 the energy content of gasoline
 - But don't confuse energy balance with petroleum displacement

Oak Ridge Study

Annual Biomass Resource Potential



Cellulose Potential

- Crop yield is key: 5-15 tons/acre
- DOE Secretary Bodman: 30% of U.S. consumption by 2030
- Oak Ridge: One-third of current U.S. consumption
- Aspen Institute report: 100 billion gallons
- Venture capitalist Vinod Khosla: “We don’t need oil for cars & light trucks.”

How Soon?

- Rapid near-term ramp-up of corn ethanol
 - 15 billion gallons by 2015
- Cellulosic ethanol introduction
 - As soon as 2008, no later than 2012
 - Substantial growth 2015-2020

Introducing a Fuel

- Three elements of a viable market
 - Fuel supply, distribution infrastructure, vehicles
- Market demand
 - Price
 - Mandates

Key Constraints

■ Infrastructure

- Pumps and pipelines
- Harvest and transport

■ Flexible fuel vehicles

- 6 million on the road

■ Investment and oil price uncertainty

Accelerating the Transition

- Countercyclical subsidies
 - What’s good for the goose...
- Renewable Fuel Standard
 - Phase out toxic “aromatics” in gasoline
- RDD&D commensurate with:
 - The national security risk
 - The economic opportunity
 - Churchill: “Action this day”

A Darwinian IQ Test?

Vinod Khosla:

- Feed Mideast terrorism or Midwest farmers?
- Import expensive gasoline or use cheaper ethanol?
- Create farm jobs or Mideast oil tycoons?
- Fossil fuels or green fuels?
- ANWR oil rigs or “prairie grass” fields?
- Gasoline cars or cars with fuel choices?

<http://www.khoslaventures.com/resources.html>

For more information...

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