

Fuel Supply Security By Synthetic Fuel Production



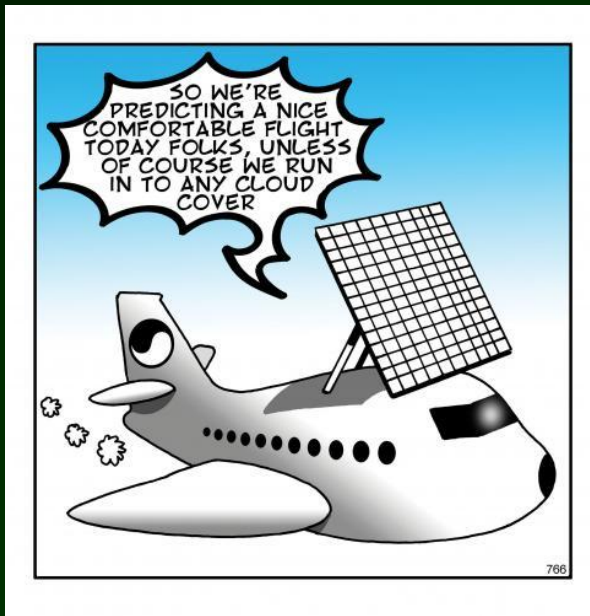
How the manufacturing of synthetic fuel
can secure domestic fuel supply & stabilize price.



By R.C. Knight
President of Integrated Synthetic Fuel Incorporated
www.isfuel.com Date: 08/26/2010

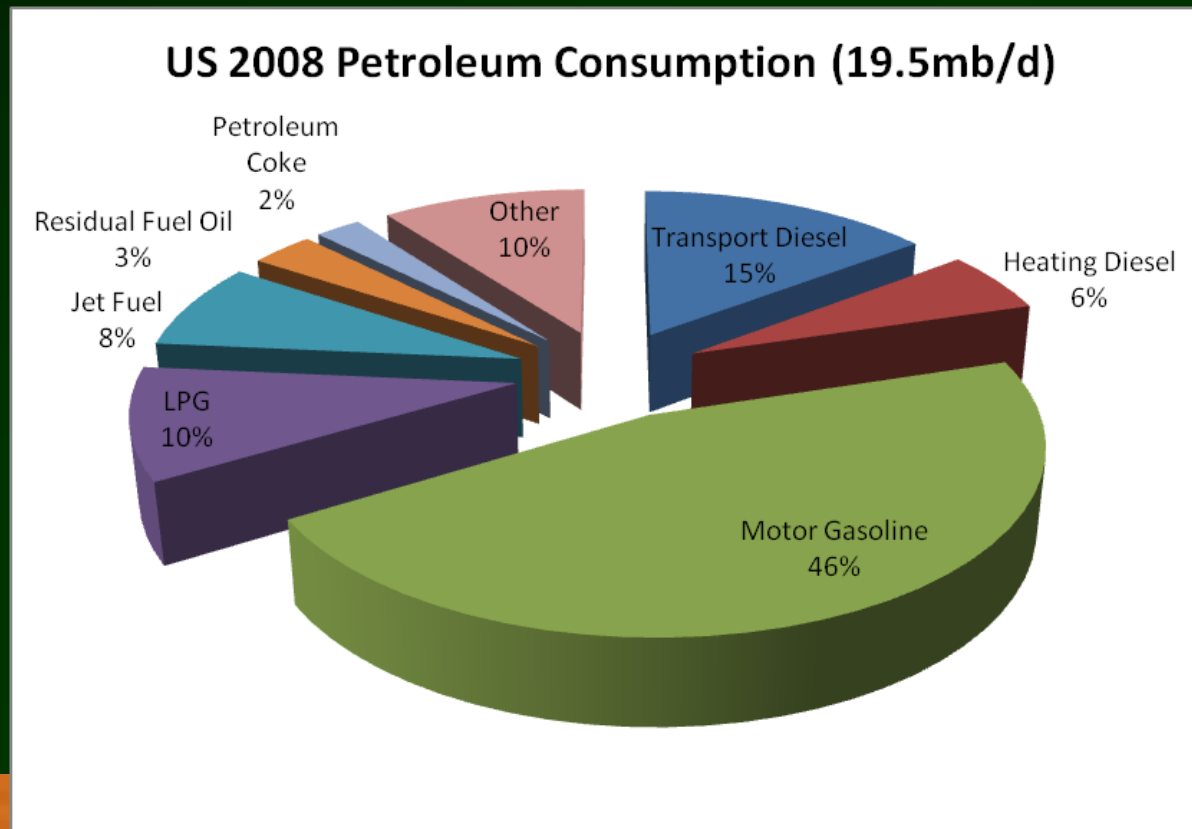
No Alternative to Diesel & Jet Fuel

- Diesel Powers Large Trucks, Trains & Ships
- No Alternative for Aircraft Propulsion
- Alternative Feedstock & Production – Only Viable Alternatives



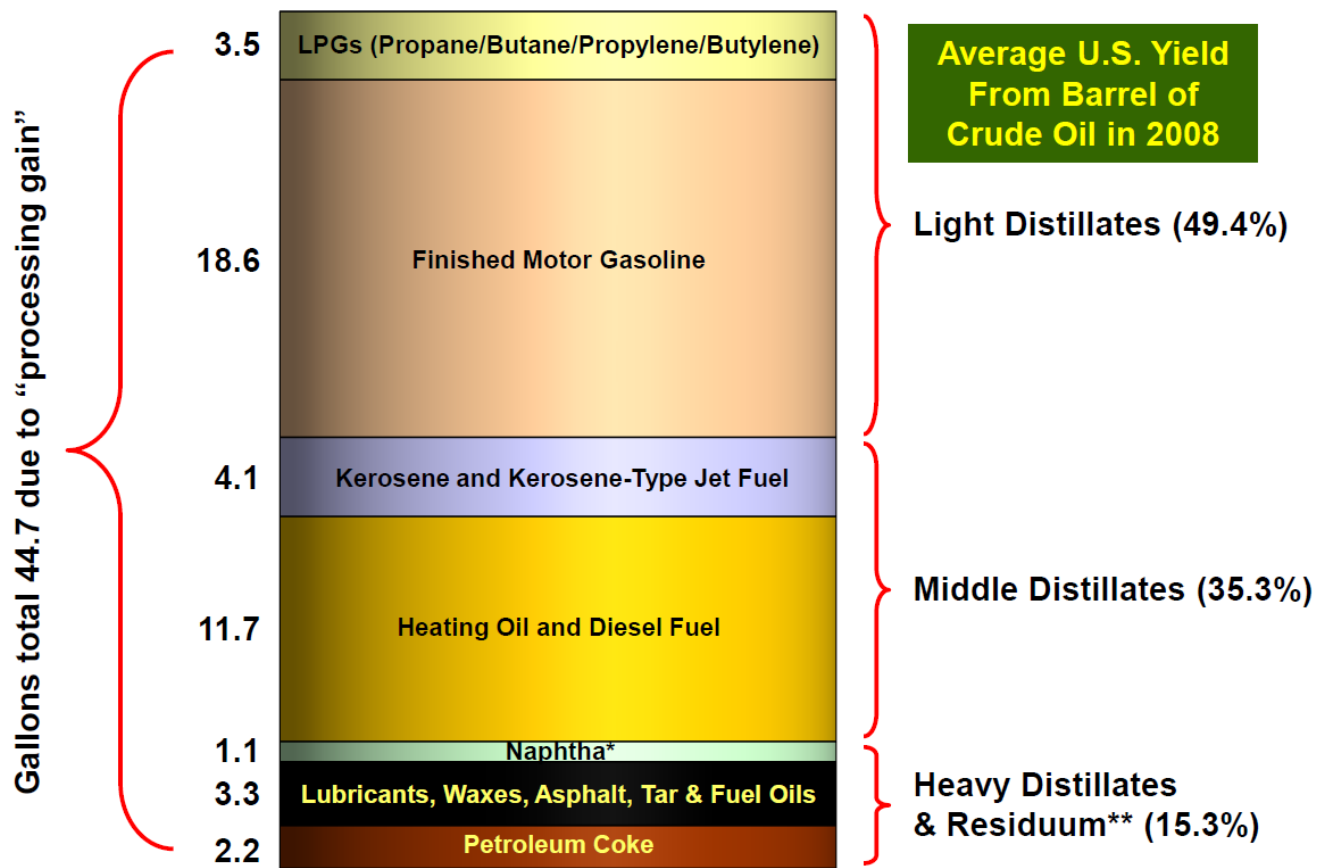
Fuel Supply – Industry Risk

- Refiners main product is gasoline
- Oil shortage results in gasoline imports
- Gasoline alternatives reduce demand of gasoline refining



Fuel Supply – Industry Risk

Jet Fuel Is a Drop in the Bucket, Subject to the Refinery Economics for All Petroleum Segments (incl. Gasoline)



* Feedstock for high-octane gasoline, petrochemicals and solvents

Sources: [Energy Information Administration](#) and [American Petroleum Institute](#)

** Includes heavy oils used in industry, marine transportation and electric-power generation

www.airlines.org

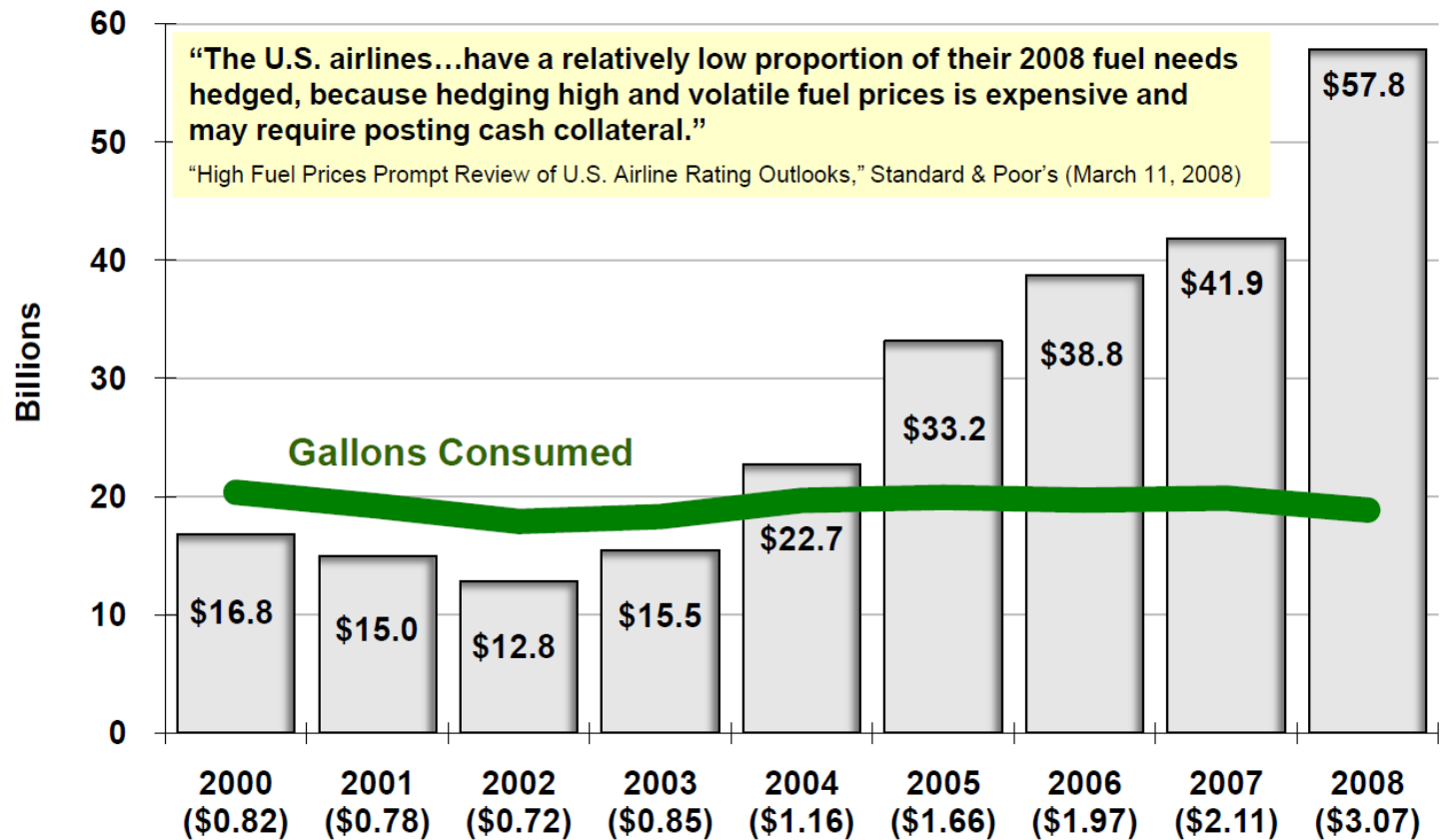


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Fuel Supply – Industry Risk

**In 2008, U.S. Airlines Spent \$16B More on Fuel
Despite Consuming > 5% Fewer Gallons**



Note: Value in parentheses below year is average price paid per gallon excluding taxes, into-plane fees, pipeline tariffs and hedging costs

Sources: ATA, Energy Information Administration, Department of Transportation

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Domestic Synthetic Fuel Production

- Utilizes Domestic Feedstock – Coal, Biomass & Municipal Waste
- Creates Domestic Supply – Mitigates Supply Risks
- Supports Domestic Economy
- New Facilities Focused on Diesel & Jet Fuels – Supply Security



Joint Synthetic Fuel Developments

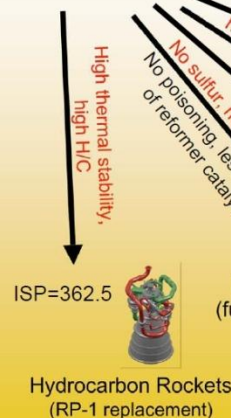
- JBUFF (Joint Battlespace Use Fuel of the Future)
- SBF (Single Battlespace Fuel)
- Military Interest – One Fuel for Trucking & Aviation

OSD Assured Fuels Initiative Goals

- **Total Energy Development (TED)**
 - Catalyze the industry to produce fuels for the military from domestic energy resources
 - Develop a roadmap to provide fuel for the Joint Battlespace Use Fuel of the Future program and implementation
- **Joint Battlespace Use Fuel of the Future (J-BUFF)**
 - Develop fuel specifications that include non-petroleum components, for use in military equipment, aircraft, ships and ground vehicles
 - Validate use of the fuels in all tactical vehicles, aircraft and ships
 - Provide a transition plan for DoD wide deployment

SINGLE BATTLESPACE FUEL From Unconventional Resources

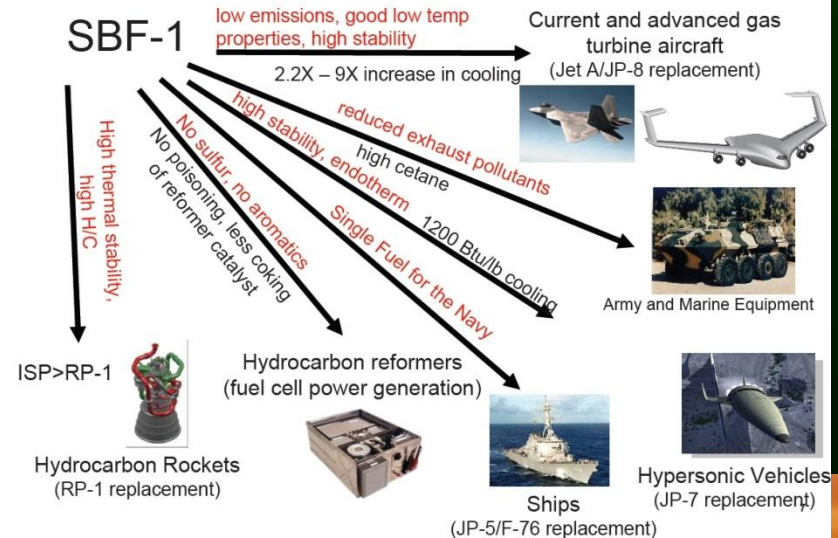
SBF-1



SINGLE BATTLESPACE FUEL From Unconventional Resources



SBF-1



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Joint Synthetic Fuel Benefits

- Wider Market (Diesel & Jet)
- Broad Industry Interest
 - Aviation, Trucking, Rail
 - Transportation Alliances
- Military Interest – Single Battlespace Fuel
- Humanitarian Utilization – Emergency Relief



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Candidates For Joint Synthetic Fuel

- FT Fuels
 - Not Viable, Low Density & Fuel System Issues (O-ring Swell)
- Pyrolysis Derived Fuels
 - Not Viable, High Density & Cetane Issues
- Biodiesel
 - Not Viable, Freeze Points & Feedstock Issues (Availability & Food)
- Ethanol
 - Not Viable, Low Energy Density & Safety Issues



Joint Synthetic One (JS-1)

- First Viable Joint Synthetic Fuel
- Blend of High Density & Low Density Synthetic Fuels
- Co-processing Increases Plant Production & Efficiencies
- High Density Synthetic (HDS)
 - Pyrolysis Derived
 - High Density & Swells O-ring
- Low Density Synthetic (LDS)
 - Gasification (FT) Derived
 - Low Density & Good Lubricity



Summary

- No Alternatives to Diesel & Jet Fuels
- Price Tied to Oil & Crack Spread (Refining)
- Domestic Synthetic Fuels To Safeguard External Threats
- Diesel / Jet Production Facilities
 - Broader Markets
 - Transportation Industry vs. Isolated Industries
 - Separation From Gasoline Markets
- Some Synthetic Fall Short In Performance
- Joint Synthetic Option
 - Increased Fuel Performance
 - Increased Production Efficiencies
 - Wider Market Opportunities & Broader Industry Interest

