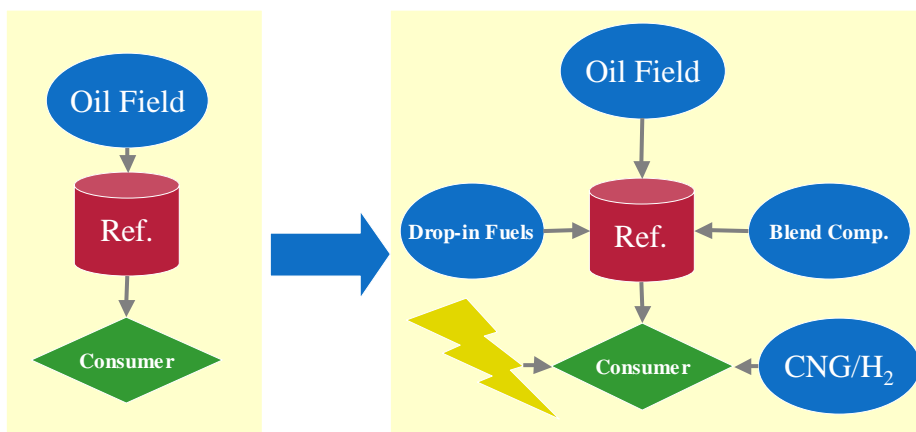




**OVERVIEW**

*Scatter Shot Reform* analyzes how the global transport fuel markets will develop in the coming decades, and quantifies the impact of each technology on a region-by-region basis. The ultimate result is a forecast of the global influence of these forces on transport fuel demand through 2025.

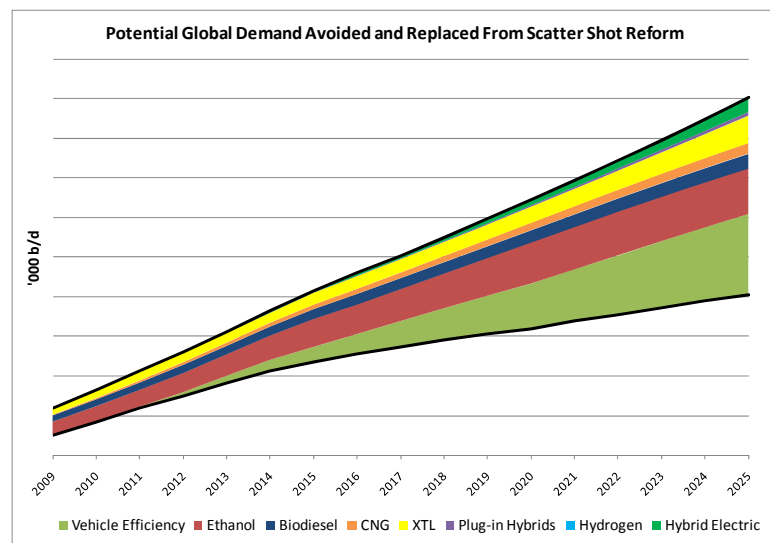


ESAI’s analysis shows that competing and most often conflicting reform will result in a vastly different fuels landscape than the comparatively simple gasoline and diesel market in place today. This sector will most likely not develop in a manner envisioned by any stakeholder in the current process.

This *active study* examines the global impact on transport fuel demand of emerging fuel and technology options. It addresses the rising tide of tighter vehicle economy standards, sustainability concerns, global oil markets, and new technology and fuels, highlighting factors that will impact the future landscape.

As part of its ongoing examination of this market, ESAI will release the first ESAI Alternatives and Petroleum Quarterly in February 2010, which will provide the most current view of the forecasts in Scatter Shot Reform.

**ANALYZING AND QUANTIFYING THE GLOBAL IMPACT ON OIL MARKETS, GASOLINE AND DIESEL**



ESAI has gathered and synthesized a wide range of public, private, and proprietary information, reconciling often conflicting viewpoints to develop a comprehensive view of the market potential for alternative fuels and new vehicle technologies. This new data is evaluated alongside ESAI’s deep experience in the energy industry and comprehensive database of petroleum fundamentals. The result is a holistic understanding of transport fuel demand through 2025.

**BENEFITS: A COMPLETE UNDERSTANDING OF ALTERNATIVE FUELS AND VEHICLE EFFICIENCY**

- **An independent and complete view on the true impact and potential** of automotive technologies, climate change, policy, and economics.
- **Clarity and insight** on the viability of low-cost, low-carbon, scalable and sustainable fuels.
- **Foresight into the series of hurdles affecting long-term success** to identify potential strategies.
- **Anticipate and adapt to changing market conditions and an evolving field of players.** ESAI's *active study* approach will update as this field grows and gains influence.
- For a description of the topics included in the study, please see the attached **Table of Contents**.

**ESAI'S ACTIVE STUDY APPROACH WILL KEEP YOU PREPARED AND UP-TO-DATE**

Our goal is to keep you prepared, so that you can act when the time comes. ESAI's study is not designed to be a single interaction. Instead, it is an *active study*:

- **Quarterly Updates:** ESAI will issue updates as the market landscape changes. The first *ESAI Alternatives and Petroleum Quarterly* will be released in February 2010. In addition to recalculating ESAI's forecast with up-to-date information, it will discuss:
  - Updated Regional and Global Data Tables, by Fuel and Technology through 2025.
  - Beyond Cap-and-Trade: California's LCFS and the Rise of Regional Fuels Policies.
  - The State of Technology: Battery-Electric Vehicles and Alternative Power trains.
  - ESAI's Global Crude and Product Forecast: Implications for Alternative Fuels.
- **Expert Support:** ESAI experts are available to elaborate on the study's conclusions and forecasts for near- and long-term strategic planning.
- **Tailored Research:** *Scatter Shot Reform* draws from a wide information resource as well as ESAI's comprehensive petroleum fundamentals database. ESAI can tailor the report to suit your needs and information requirements, addressing specific issues.

**DELIVERABLES AND PRICING**

*Current ESAI customers will receive a 20% discount.*

- **Scatter Shot Reform, ESAI Alternatives and Petroleum Quarterly, and Expert Support:** A copy of the 250+ page report, plus quarterly updates and access to ESAI experts. A one-year membership is \$15,000.
- **ESAI Alternatives and Petroleum Quarterly:** Receive ESAI's alternatives forecast and quarterly updates for \$5,000 annually.
- **Workshops:** ESAI experts are available to present the findings of the study for an additional fee, plus travel and expenses (if applicable).

**ABOUT ESAI**

Energy Security Analysis, Inc. is an energy research and consulting firm located outside of Boston, Massachusetts. Since its inception in 1984, ESAI is the recognized authority on energy markets helping clients stay on top of the petroleum, natural gas, and power markets. ESAI provides market analysis and strategic decision-making support to producers and consumers of energy around the world and is dedicated to monitoring, analyzing, and synthesizing information about world-wide energy markets. Visit [www.esai.com](http://www.esai.com) for more information.

## REQUEST FOR MORE INFORMATION/ ORDER FORM

If you are interested in subscribing to Scatter Shot Reform or the ESAI Petroleum and Alternatives Quarterly, please contact Soner Kanlier at [skanlier@esai.com](mailto:skanlier@esai.com) or **781-245-2036 x22**. You may also fill out and return this form, either via fax to **781-245-8706**, or by postal mail to **401 Edgewater Place, Suite 640, Wakefield, MA 01880**.

### FEE SCHEDULE

#### Scatter Shot Reform: Fuel Engine Pathways for Automotive Transportation 2010-2025 and ESAI Petroleum and Alternatives Quarterly:

- ESAI Clients: US\$12,000
- Non-Clients: US\$15,000

#### ESAI Alternatives and Petroleum Quarterly Only:

- ESAI Clients: US\$4,000
- Non-Clients: US\$5,000

### PAYMENT METHOD

- Please have ESAI send an invoice
- Check enclosed, payable to: *ESAI Energy LLC*
- Please send additional information

Total US\$ \_\_\_\_\_

### CONTACT INFORMATION

Name: \_\_\_\_\_

Job Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City State/Province Postal Code: \_\_\_\_\_

Telephone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Signed (signature required): \_\_\_\_\_

Date: \_\_\_\_\_

### CONFIDENTIALITY AGREEMENT

I agree to the terms stipulated in this prospectus. I agree to maintain the study's confidentiality and not to publish, copy, or divulge any portion of its contents to any third parties beyond the employees of the enrolling organization without prior consent by ESAI

## **Table of Contents (Abridged)**

### **Executive Summary**

#### **1. Introduction – Scatter Shot Reform**

- I. Energy and the Pattern of Scatter Shot Reform
- II. Scatter Shot Reform for Transportation Markets
- III. Drivers of Transportation Fuel Reform
- IV. Government Support for the Development of New Transportation Fuel Drivers
  - a. U.S. Renewable Fuels Standard, Obama Fuel Economy, Carbon Cap-and-Trade, and State-Level Complications
  - b. The European Union, Climate Policy and Trade Protectionism
  - c. Brazil, China, and South Africa: Energy Security and Market Development
- V. Automaker Drivers of Alternative Fuel Pathways
  - a. Enhanced Vehicle Efficiency
  - b. Diesel Vehicles
  - c. Electric, Hybrid-Electric
  - d. Flex Fuel
  - e. Hydrogen
  - f. Automaker Strategies
- VI. Oil Industry Drivers of Alternative Fuel Pathways
- VII. Conclusion: A Fractured Landscape, Scatter-Shot Reform

#### **Chapter 2: ESAI's Outlook for Transport Fuel Supply and Demand**

- I. Outlook on Supply and Demand for Oil
  - a. Turn Back the Clock to Business as Usual Demand Growth
  - b. Avoided Demand
  - c. ESAI's Current Outlook Reflects Some Avoided Demand
- II. Global Crude Outlook
- III. Diesel Demand
- IV. Gasoline Demand
- V. Product Supply and Refinery Investment
- VI. Price Implications

#### **Introduction to Engine Technology: From Small and Large Vehicle Fleets to Many Large Vehicle Fleets**

#### **Chapter 3: Diesel Vehicles and Dieselization**

- I. Introduction
- II. The Lure of Dieselization and the Promise of Diesel

- 
- a. The Lure of Dieselization in the United States: Energy Security and CAFE
  - b. The Lure of Dieselization in Europe: Lower Taxes and Emissions
  - c. Dieselization in Developing Nations: Fuel Availability
  - d. The Promise of Diesel
  - III. Limiting Factors to Dieselization
    - a. Fuel Supply and Technology Costs
    - b. High Fuel and Technology Costs Affect Payback, Diesel Economics
  - IV. Solutions and Second Generation Options
    - a. Diesel fuel limitation
    - b. Diesel Technology Catalyst Limitation
  - V. Prospects for Cleaner Diesel
    - a. U.S. Diesel Markets Will Be a Source of Growth
    - b. European Dieselization Will Slow
    - c. Cleaner Diesel Synonymous with Development in Non-OECD countries
  - VI. Conclusions

#### **Chapter 4: Fuel Economy and Hybrid-Electric Vehicles**

- I. Introduction
- II. Engine Efficiency Technologies
  - a. Engine Technologies: The Hand of the Automakers
  - b. Drivers of Emerging Engine Technologies
  - c. Emerging Engine Technologies
  - d. Hybrid-Electric Power Trains
- III. Fuel Savings from Efficiency Improvements and Hybrid Vehicles
  - a. North America and Europe
  - b. Asia
  - c. Eastern Europe/FSU, Latin America, Middle East, and Africa
- IV. Conclusion, Global Potential for Engine Technology Gains

#### **Chapter 5: Plug-In Hybrids**

- I. Introduction
  - a. The Origin of Plug in Electric Vehicles
  - b. Plug-in Power Trains
- II. Efficiency gains from a Plug-in Hybrid and Hybrid Electric Vehicles
  - a. Battery Terminology, Capacity
  - b. General Fuel Efficiency
  - c. Emissions Savings
- III. Limitations of Plug-in Hybrid Electric Vehicles
  - a. Technological Challenges

- b. Infrastructure Challenges
- IV. Feasibility of PHEV Vehicles
- V. Supply of PHEV Vehicles, Transportation Fuel Demand Avoided
  - a. United States Efforts
  - b. Location of Grid Upgrades
  - c. Asian PHEV Efforts
  - d. European PHEV Efforts
  - e. Latin America, FSU, Africa and Middle Eastern Efforts
- VI. Summary: Total Impact of PHEVs on Transport Fuel Demand

## **Alternative Fuels: No Clear Successor to Gasoline and Diesel**

### **Chapter 6: Ethanol**

- I. Introduction
  - a. Ethanol Basics
  - b. Promise of Ethanol
  - c. Ethanol Encounters Problems
  - d. Second Generation Fuels: A Solution to First Generation Ills?
  - e. Continued Roadblocks Besides Technology
  - f. Prospects for Ethanol
- II. Supply and Demand for Ethanol Fuels
  - a. The U.S. Renewable Fuels Standard
  - b. Canadian Supply and Demand
  - c. Latin American Ethanol Supply and Demand
  - d. Asian Ethanol Supply and Demand
  - e. Ethanol in Western Europe
  - f. Ethanol in Eastern Europe/FSU
  - g. Ethanol in Africa
  - h. Ethanol in the Middle East

### **Chapter 7: Biodiesel**

- I. Introduction
  - a. The Basics of Biodiesel
  - b. Biodiesel Benefits
  - c. Biodiesel Shortcomings
  - d. Second Generation Biodiesel
  - e. Prospects for Biodiesel
- II. Regional Outlook for Biodiesel
  - a. North America

- b. Europe
- c. Eastern Europe and FSU
- d. Asia
- e. Latin America
- f. Africa
- g. Middle East
- h. Conclusion: A Market on the Brink

## **Chapter 8: Compressed Natural Gas**

- I. Introduction
  - a. Promise of CNG
  - b. CNG Caveats
  - c. Future outlook for CNG fuels
- II. Avoided demand for CNG Vehicles
  - a. North America
  - b. Europe
  - c. Asia
  - d. South America
  - e. Middle East, FSU and Africa
  - f. Conclusion: A Niche Market

## **Chapter 9: GTL, CTL, and Next Generation Synthetic Fuels**

- I. Introduction
  - a. The Promise of CTL and GTL Fuels
  - b. Limiting Factors of FT Synthetic Fuels
  - c. Solutions to Synthetic Fuels' Shortcomings
  - d. Feasibility of Second Generation Options
- II. Potential CTL, GTL, and BTL Supply
  - a. CTL Supply and Demand
  - b. GTL Supply and Demand
  - c. Biomass-to-Liquid Potential

## **Chapter 10: Hydrogen Fuel Cells**

- I. Introduction
  - a. Fuel Cell Technology
  - b. Applications of Hydrogen Fuel Cells
  - c. Drawbacks of Hydrogen and the Conditions for a Hydrogen Vehicle Market
- II. Estimates of Hydrogen Vehicle Penetration
  - a. North America
  - b. Europe

- c. Asia
- d. Follow-on Markets
- e. Outlook for Global Hydrogen Vehicles

## **Chapter 11: Conclusion, Impact by Geographic Region**

- I. A Complex Web of Potential Results and Forecasts
- II. A Template for Climate Policy
- III. Scatter Shot Reform: Opportunities and Challenges in Transport Fuels
  - a. Scatter Shot Reform in North America
  - b. Scatter Shot Reform in Europe
  - c. Scatter Shot Reform in Asia
  - d. Scatter Shot Reform in Latin America
  - e. Scatter Shot Reform in Eastern Europe and the Former Soviet Union
  - f. Scatter Shot Reform in the Middle East
  - g. Scatter Shot Reform in Africa
  - h. Global Scatter Shot Reform
- IV. Impact on the Oil Markets
  - a. A Range of Outcomes for Refiners
  - b. Gentler Refining Cycle
  - c. Alternative Fuels Present Opportunities for Traditional Oil Companies