Strategies to Increase Engine Efficiency

Drivers

- Corporate Average Fuel Economy (CAFE) standards
- Air Pollution
- Climate change
- Greenhouse gases

Approach

- Increased compression ratio
  - Greater thermodynamic efficiency
- Engine downsizing/downspeeding
  - Smaller engines operating at low-speed/higher load are more efficient
  - Optimized with 6 to 9 speed transmission
- Turbocharging
  - Recovering energy from the engine exhaust
  - Increase specific power allowing smaller engine
- Direct injection
  - Cooling the air-fuel mixture, fuel evaporates in combustion cylinder
High Octane Fuel for High Efficiency Engines

- Formulation
  - Compatibility
  - Fungibility
- Introduction
  - Transition
  - Replace existing product
  - Add as new product
- Misfuelling
  - New vehicles
  - Old vehicles

- Labeling
  - Octane
  - Content
- Liability
  - Misfuelling
  - Product quality
- Regulatory
  - Approval of fuel
  - Competing regulatory programs
  - Federal versus state
Ethanol and High Octane Fuel

- High octane number
- Lower cost blendstock
- Lower cost fuel
- Lower life-cycle GHG emissions (9-19%)

E10+ Blends
- Corrosion potential
- Equipment compatibility
- Engine compatibility
- Consumer education
E10+ Blends – Marketer’s Dilemma

- Product quality
  - Blended on site
  - Blended at a terminal
- Risk/liability mitigation
  - Compatibility
  - Misfuelling
  - Corrective action
- Consumer education
Fuels Institute Committees

- Fuels and Infrastructure Committee
  - Legacy and emerging fuel options
  - Fuel quality and specifications
  - Fueling infrastructure

- Vehicles and Mobility Committee
  - Vehicle powertrains, personal vehicle ownership, vehicle technologies and regulations, and consumer preferences
  - Car and ride sharing services, trends in travel trip data

- Global Markets Committee
  - Current and future governmental regulations affecting the fuels and vehicles markets and overall trends in market evolution
Fuels Institute - Fuel Quality Council

- Engine performance survey
  - Focused on issues relating to engine maintenance and failures, particularly fuel-related systems
- Fuel quality survey
- Product distribution best practices
  - best/recommended practices for ensuring product quality from refinery gate to nozzle
- Fuel and vehicle specification
Recent Fuels Institute Publications

- The Case of E-15 (February 2018)
  - Individual case studies of retailer experiences selling E15
- Consumers and Alternative Fuels (December 2017)
  - Drivers of Air Pollution, Climate Change and Congestion Mitigation
  - Biofuels Lead Transport Policies
  - Fuel Economy Regulations Gain Traction
  - Momentum is Gaining to Mandate Changes to Powertrains
  - Improvements in Traditional Energy and Fuel Remain Critical
Fuels Research Publications in the Works

- Vehicle Sales and Fuel Prices from 2006 to 2016
  - Analysis of vehicle sales by class and powertrain considering fuel efficiency, suggested retail price, and fuel prices
  - The rise of the CUV post-recession emerges as one of the biggest market trends in recent years.

- Biofuels Compatibility: Overview of Federal Regulations for Retailing Biofuel Products
  - An overview and reference guide to major federal regulations affecting the retailer requirements for handling fuel comprised of E10 plus and B20 plus
Fuels Research Publications in the Works

• Analysis of the Potential for Increasing Octane in the U.S. Fuel Supply
  • Scalability and cost of viable fuel formulations
  • Market and regulatory implementation strategies
  • Potential consumer acceptance of a new fuel.

• Understanding the Dynamics of the Electric Vehicle Market
  • Total cost of ownership
  • Infrastructure requirements and anticipated consumer recharging behavior
  • Relationship of EVs to competing technology.