



Enabling Our Clean Energy Future
Diesel Exhaust Fluid (DEF) & Biofuel Blending Solutions

Supporting biofuel distribution through F.A.ST.™ On-demand, variable ratio blending with a review of climate controlled storing and dispensing of Diesel Exhaust Fluid (DEF)

Introduction

Renewable Biofuel content in the domestic fuel supplies is hampered by economic, quality, safety and infrastructure challenges that limit broad and timely acceptance of Biofuels within the marketplace. The U.S. Environmental Protection Agency Renewable Fuel Standard (RFS) ¹ requires a minimum level of renewable fuel which began in September 2007 under the Federal Energy Policy Act of 2005 (EPA). This RFS program is targeted at fuel producers and importers and was set initially at a minimum 4.02 percent for 2007 and increased to 7.76 percent for 2008 on February 14, 2008 ². Renewable fuel level requirements will continue to increase equating to 35 billion gallons of renewable and other alternative fuels by 2017 ³.

Clean Emission Fluids' patent pending, on-demand, bio-blend F.A.ST.™ units, termed for Fluids Affordably STored™, extends Biofuel distribution capability downstream into the marketplace whereby favorable pricing may be achieved and quality and safety maintained while utilizing the benefits of existing infrastructure.

The F.A.ST.™ On-Demand blending system encompasses multiple and various fuel types and additives. Using an example on-highway diesel market, a significant share of this 37 billion gallon on-highway distillate fuel oil market ⁴ will have the biodiesel requirement blended at the refiners and terminals utilizing conventional supply chains, storage and dispense infrastructure to handle demand. At the 2008 RFS requirement of 7.76 percent, the biodiesel volume requirement is estimated to be 2.9 billion gallons. In 2006 an estimated 225 million gallons of biodiesel were consumed in the United States⁵.

Infrastructure limitations, quality issues, and economics are key factors that relegate this example 2006 biodiesel throughput at only 11.8 percent of the U.S. Environmental Protection Agency's RFS requirement for 2008.

The market will clearly adapt to the increasing RFS requirements for Biofuels, however an accelerated, and necessary, timetable may adversely impact end-of-pipe consumer quality, price and safety not to mention demands on infrastructure for delivery and production.

Market Info

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The market encompasses primarily and initially of fleet fueling and travel centers, approximately 16,000 and 32,000 throughout the United States, respectively. Existing infrastructure, consists of in-ground tanks and island dispensers, which do not easily deliver provide for variability in Biofuel content for the consumer. Installing new in-ground or other permanent systems are costly with extended lead-times, plus the added costs for environmental issues, leak detection and inspections. The risks and indeterminate volume associated with a developing market do not favor capital intensive solutions. Clean Emission Fluids embraces these markets by providing a cost effective CEF F.A.ST.™ system for storing, blending and dispensing Biofuels and other clean diesel fluids. The turn-key nature and seamless integration of the F.A.ST.™ system serves to install necessary infrastructure within these markets in a timely manner that continues to accelerate market acceptance of Biofuels.

In complement to Biofuels the CEF F.A.ST.™ system helps to install infrastructure platforms that may be adapted for new fuels or fluids not yet commercialized such as DEF, Methanol and fuel additives.

Tracking & Credits

The technology now exists to extend Biofuel blend capability into the marketplace where consumers have the option to select blend ratios, even exceeding RFS levels. Controlling this process through systems that maintain a high degree of accuracy, within 1%, is critical to meeting the quality issues that have been hampering the industry. On and off-highway vehicle and engine manufacturers specify various biodiesel limits that can and do exceed RFS levels. Manufacturer warranties specify limits which are based heavily on quality and concentration issues that are being addressed with the CEF F.A.ST.™ system. Extending this blend capability to the point of dispense combined with proper fluid storage and blend temperatures enables biodiesel producers to supply B100 directly into the marketplace helping to competitively price Biofuels for broader consumer acceptance.

U.S. Environmental Protection Agency requests tracking of Biofuel content through Renewable Fuel Standard Reporting Forms,⁶ also referred to as Renewable Identification Numbers (RINs). The CEF F.A.ST.™ system has the capability to track Biofuel consumption on a national basis that either meets the aggregate RFS levels, or voluntary consumption in excess of these levels. Higher consumption than what is required or stipulated by RFS establishes the business case for environmental credits. CEF is able to capture distributed Biofuel consumption data throughout the United States, and North American for that matter wherever F.A.ST.™ units are located, using a remote telemetry systems.

Environmentally responsible consumer sentiment alone only increases renewable consumption by a small percentage, however applying a commercial value to increased Biofuel consumption further stimulates growth. CEF F.A.ST.™ units are highly automated in this regard and serve to promote proactive environmental responsibility.

Technology

Biofuel distribution challenges remain an obstacle to the development of new emerging markets for clean, renewable energy sources. This includes Ethanol blends, biodiesel blends, and new diesel exhaust emissions reductants, commonly referred to as Diesel Exhaust Fluid (DEF), not yet available

on the open market. The CEF F.A.ST.™ system, which restated means Fluids Affordably STored™, helps install infrastructure into the marketplace, primarily and initially travel and fleet fueling centers, that is designed and effective at properly storing, correctly blending and effectively dispensing Biofuels and related fluids.

The CEF F.A.ST.™ system uniquely controls blend content through a proprietary and patent pending fluid controls and pump systems. The dispense system reads quantity flow rates and adds the necessary additive volume to within one percent. Systems, storage and blend apparatus are climate controlled to provide for proper storage temperatures and essential blend temperatures.

- Fluid Storage
 - Multiple fluid storage.
 - DEF, Bio-Fuel, and more!
 - Configurable: 55, 2,000-10,000 gal.
 - Safe, secure, high quality
 - Expandable, versatile, affordable
 - Climate control – heat, cooling, UV, particles.
- Fluid Dispense
 - Cardlock dispense system
- On-site Fluid Blending
 - Blend any combination
 - You select ratio
 - Blender unit available separately

Clean Emission Fluids F.A.ST.™ Unit Photographs taken at NextEnergy Center in Detroit, MI.



For additional information please contact Clean Emission Fluids at:
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Or visit us on the web at: www.cleanemissionfluids.com or www.dieselexhaustfluid.com

Sources:

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- ¹ U.S. Environmental Protection Agency, RFS Program (6406J), <http://www.epa.gov/OMS/renewablefuels/>, March 12, 2007.
 - ² U.S. Environmental Protection Agency, Renewable Fuel Standard: Notice of 2008 Requirement (published February 14, 2008), <http://www.epa.gov/OMS/renewablefuels/>, March 12, 2007.
 - ³ Beveridge & Diamond, P.C., <http://www.bdlaw.com/news-202.html>, March 12, 2007.
 - ⁴ Energy Information Administration Form EIA-821, "Annual Fuel Oil and Kerosene Sales Report," for 2000-2004, http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/historical/2004/pdf/table1.pdf.
 - ⁵ National Biodiesel Board, March 12, 2008, http://www.soystats.com/2007/page_24.htm.
 - ⁶ U.S. Environmental Protection Agency, Renewable Fuel Standard Reporting Forms, <http://www.epa.gov/otaq/regs/fuels/rfsforms.htm>, March 12, 2007.