

Biofuels Infrastructure

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U.S. Department of Commerce
June 19, 2007

World Energy: A Global Leader

- **Most recognized, respected biodiesel brand.**
 - **Diversified BQ-9000 production capacity.**
 - **Largest supply infrastructure in the industry.**
 - **Preeminent source of quality fuel to petroleum distributors worldwide.**
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- **Definition**: Planning, implementation, and coordination of details of a business or other operation.
- **Biodiesel application**: Moving product from plant gate to end user.
- **Primary elements**:
 - Transportation.
 - Storage.
 - Handling.

Mode Comparison

420,000 Gallons



23,000 Gallons



7,200 Gallons



1 Barge = 18.25 Railcars = 58.50 Trucks

Average Types / Sizes

- 8000 gal capacity / 7200 gal average per load (un-insulated).
- 7000 gal capacity / 6200 gal average per load (insulated).

Limitations

- Expensive for long haul.
- Lack of drivers / equipment still concern in some markets.

Regulatory Considerations

- Non Hazardous / Non Regulated.
- ULSD Reporting under 15 ppm to EPA.



- **Product**
 - Feedstock.
 - Fatty Acid Methyl Ester (FAME).
 - Glycerin.
- **Roundtrip**
 - Average 6 weeks.
- **Rate**
 - Depends on distance.
 - Number of railroads / switches required.



Typical Fleet Configuration: 30MM Gallon Plant

- 150 railcars (insulated / coiled) with average load of 23,000 gals.
- 6 weeks roundtrip.
- 10% of railcars in glycerin service.
- Double size of fleet to include feedstock delivery.



Considerations

- Ethanol ordering in large numbers; lease rates have climbed.
- Utilization increasing; rail rates firm and rising.
- 13.5% more railcars ordered in 2006 than 2005.
- 91,466 new order placed in 2006.
- Backlog of 85,826 railcars.*

*(per the Railway Supply Institute's American Railway Car Institute Committee 2006 Report)



- **Average Size**
 - 10,000 bbl / 420,000 gallons.
 - 20,000 bbl and 30,000 bbl also traded.
- **Primary Trades**
 - Mississippi North / South.
 - Houston ship channel.
 - US Gulf.
- **Rates**
 - Distance-based / most cost effective alternative of primary domestic modes.



Tanks

- Accumulate inventory.
- Size depends on location / purpose.
- Seasonal markets (position inventory closer to customer).

Typical locations

- At production facility.
- At market destination.



Considerations

- Long term leases / per gallon cost.
- Limited availability in many markets.
- Most markets require insulated / coiled tanks.

- Quality control *first priority* throughout supply chain.
- Traceability.
- Sampling / analysis.
- Establish confidence in supply chain.
- Train all elements on quality program.
- Concerns
 - Water
 - Temperature
 - Last cargoes (trucks/railcars/barges/tanks)

- **Can use existing infrastructure.**
- **Moderate capital upgrades needed:**
 - Trace heat lines
 - Insulation
 - Inline / tank blending
 - Permitting*
- **Concerns**
 - Multiple distillate products already stressing tank space.
 - Effective operations utilize multiple ME tanks.
 - ROI in an unpredictable / unstable market.

- **August 2005**
 - Methyl esters not classified by the USCG.
 - Methyl esters are classified by International Maritime Organization.
 - Product unfamiliar to ship owners and regulatory bodies
- **Concerns**
 - Illegal to ship in domestic water ways – barge traffic
 - Cannot ship internationally without IMO certification

World Energy took the lead . . .

Worked with the USCG to classify methyl ester for domestic water ways

Barge movements now possible in domestic waterways

Worked with major European customer to enact a tripartite agreement

Worked with ship owners, receiving countries, USCG and the International Maritime Organization to classify methyl ester

Classified all methyl esters as FAME (fatty acid methyl ester) – non feedstock specific

Biodiesel can now be shipped to Europe

- **Increasing volumes = increased challenges:**
 - Tank shortages.
 - Tight receiving logistics.
- **Inefficient shipment volume:**
 - Ideally 20,000 mt.
- **Concerns**
 - Production efficiency.
 - Flooding local markets.
 - Non-liquid market = inaccurate pricing.

- **Harmonized Tariff Codes:**
 - 2710, 3824 or something else.
 - Taxation implications.
 - **Freight Charges:**
 - Tight markets breed higher pricing.
 - **Concerns**
 - Tax policies inhibit biofuel growth / trade.
 - Tracking import / export markets.
 - Higher freight costs slow growth / availability.
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