



Small Scale Modular Units & the Future of Biodiesel

Biodiesel for New England

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The Overall Biodiesel Story

a renewable alternative for petroleum diesel

- **Home Grown** *Abundant domestic low/no-cost sources located at high-use centers, can use locally produced vegetable oils & tallow Think of it as “distributed fuel generation”*
- **Healthier** *reduces air pollution and related public health risks*
- **Versatile** *high BTU fuel, similar properties to No. 2 diesel can splash blend in any percentage with No. 2*
- **Practical** *integrates easily with existing No. 2 infrastructure*
- **Flexible** *transportation, heating and power generation*
- **“Green”** *renewable, lower energy input than ethanol, very low GHG emissions, biodegradable, non-toxic*

Biodiesel bridges current demands & needs with future Energy solutions

Considerations Relative to Biodiesel

■ Feedstock

- Virgin Vegetable Oils
- Used Oils
- Tallow
- POTW Waste fats

■ Process Technology

- Established Batch Processing
- Continuous Flow Processing

■ Sourcing

- Use:
 - Established Biodiesel Producers
 - Emerging Concerns
- Develop Local Option by utilizing modular & scaleable units

Supply & Demand Based



The Biodiesel Challenge

The challenge is not whether or not Biodiesel makes **environmental** sense . . .

Rather it's how to integrate Biodiesel into a community or existing company's operation where it makes **strategic & economic sense**

Advantages of a Local Option

- Expands markets through “grass root” applications
local participation = local direct benefits
- Decreases impact of some direct production costs impacting cost of biodiesel
- Effects an increase in value produced (exceeds value of the biodiesel)
- Has a quantitative environmental benefit in terms of air quality (sulfur & particulates)
- Positions producer/community to take advantage of a change in the “energy landscape”

What is a Modular unit?

For purposes of discussion

- A modular production unit would be:
 - Reliable, service contract, test-engineered, lower capital costs per unit production capacity
 - Shop fabricated
 - Pre-assembled & shipped on a pallet or in a container
 - Incorporate a high yield production process
 - Scalable, but initially smaller in size (150 gals/hr to 500 gals/hr)
 - Transportable
 - Ownership would tend to be directed at independents
- Advantages
 - Flexible
 - Expandable
 - Simple & tested permitting process
 - Could piggy back on existing operations or processes
 - Reduce labor costs & transportation costs
 - Utilize existing services (i.e. feedstock or steam/heat)



Who Might Consider Modular Units?

- Municipalities
- Companies with Access to Feedstock Supplies
- Solid Waste & Water Treatment Authorities
- Petroleum Distributors
- Renderers
- Utilities
- Restaurant Chains & Associations
- Agricultural Concerns
- Entrepreneurs
- Diesel fleet operators

Why Consider a “local” approach?

- From a community’s perspective
 - Improve local air quality
 - Expands local economic base
 - Improves the “localized” environment
 - Reduces dependency on imported energy
 - Can help support local agriculture
 - Reduces a significant portion of transportation costs
 - Represents commitment to sustainability & stewardship
 - Offers a degree of self-sufficiency

Why Consider a “local” approach?

- From a company’s perspective
 - Offers higher value for “waste grease”
 - Utilizes existing assets to help bring down associated costs
 - Represents shift towards sustainability
 - Proactively positions fleet to meet future rules & regs
 - May facilitate “near” cost equivalent fuel
 - Generate & bank Emissions Reduction Credits or Tags
 - Can help Utilities meet their renewable portfolio standard requirements

Into the Community Mix

- Creates new jobs
 - Direct – Projected @1 new job / 100k gals produced
 - Indirect – can be as high as 2:1 (Indirect to Direct)
- Captures energy dollars LOCALLY
 - diverts dollars away from paying for IMPORTED energy
 - creates economic stimuli for communities that may be as high as a 5 to 1 increase in local economic activity based on captured energy dollars
- Broadens tax base
- “Bottom-line” – implementation costs may be largely off-set



Questions relative to the Company Mix

- What are the revenues received or costs incurred for pick-up of used-oils produced?
- What financial incentives exist (state, federal, local)?
- How much No. 2 is being used by fleet?
- What existing production assets are there that can help off-set biodiesel diesel costs?
- What is the company's position on sustainability as a competitive advantage?

Bottom Line: Is this something to consider? ("back of an envelope" approach)

- Feedstock availability – what is the estimated amount of feedstock available locally & at what cost
- Demand – how much fuel would be required to meet the needs of:
 - School district
 - UPS service hum
 - Local transit authority
 - Existing fleet of tractor trucks
 - Home heating needs of a community

Bottom Line (cont.)

- What is the “order of magnitude cost”?
 - Capital Costs for a commercially viable unit
 - Range from **\$0.35 - \$1.25/gal** annual capacity
 - What is the space required?
 - Processing area can be as little as 12' x 50'
 - What are some of the local citing issues?
 - Operating Costs (see attached)

Economic-Mechanics for a “Hypothetical” Cost Comparison

		New Use \$0.185/lb deliv.		Yellow Grease \$0.085/lb deliv		Waste \$0.00/lb
Expenses						
	Base Cost of Feedstock	\$1.30		\$0.58		\$ -
	Transportation (Feedstock)	\$0.05		\$0.03		\$ -
	Chemical Components	\$0.22		\$0.22		\$0.24
	Energy	\$0.03		\$0.04		\$0.06
	Labor	\$0.16		\$0.18		\$0.20
	Other Direct (Maintenance./Overhead/Royalties)	\$0.15		\$0.15		\$0.15
	Indirect (Admin., Insurance, Sales & Marketing)	\$0.15		\$0.15		\$0.15
	Capital Costs	\$0.15		\$0.16		\$0.18
	Transportation (to Distributor)	\$0.04		\$0.02		\$0.02
		\$2.25		\$1.55		\$1.00
(less)						
	Contribution of Glycerol (7% vol @ \$0.09/lb)	\$0.10		\$0.10		\$0.10
	Incentives (i.e. USDA's CCC)	\$0.60		\$ -		\$ -
	Tipping	\$ -		\$ -		\$0.05
	Projected Cost to Producer	\$1.55		\$1.20		\$0.85

BT's Vision

- Modular units - commercially viable
 - providing means to capture energy dollars locally
 - & to have a quantitative environmental benefit
- Continuous flow process – scalable, less expensive, offer superior yields to batch process
- Grass Roots Approach - within high use areas of the country make sense



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