

Biodiesel - “From Fat to Fuel”

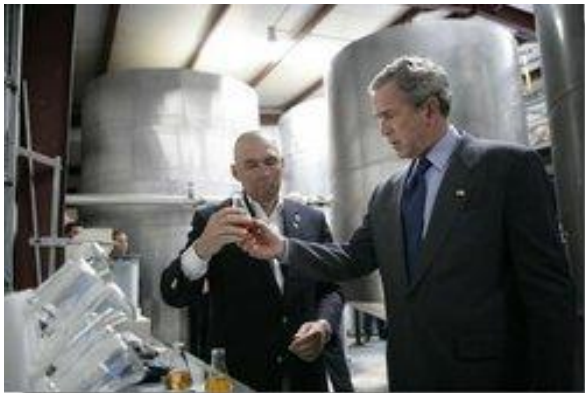
Environmental Sustainability for Cities



Olof Hansen
U.S. EPA Region 9
San Francisco, CA

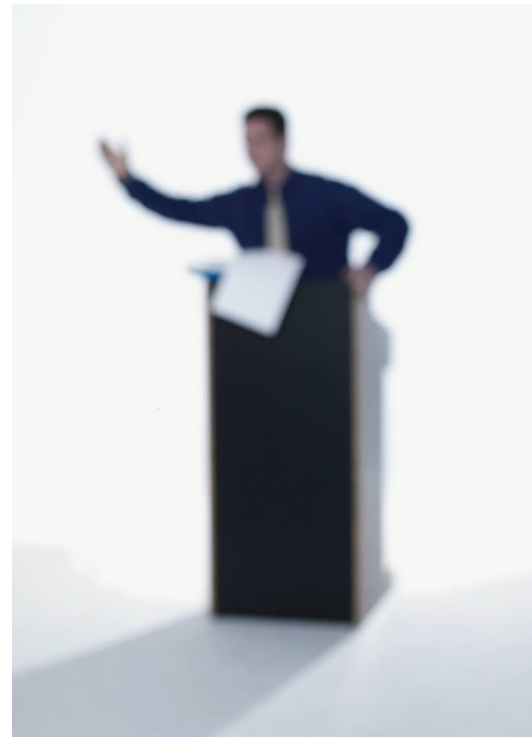
Everyone is on board!

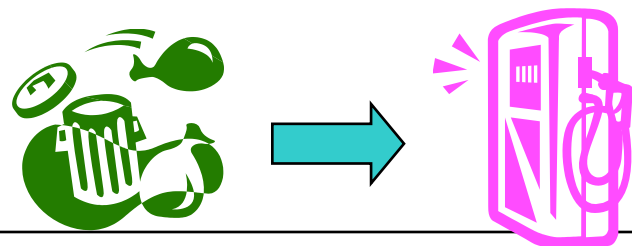
Bi-partisan
East Coast-West Coast
National and Local



Contents

- Benefits of waste-derived Biodiesel
- Community Business Models
 - Commercial
 - Public
 - Legal
- Resources





Benefits of Waste-derived Biodiesel:

Beyond Fossil Fuels and Soybeans

Benefits of Waste Derived Biodiesel (Part 1)

- Conserves Resources
 - Up to 3 billion gallons of waste grease in the US
- Recovers Energy
 - Diverts resources and energy away from landfills
- Saves Costs
 - Waste grease costs a lot less than virgin soy oil
- Protects Water Quality and Infrastructure
 - 80% of US sewage overflows from Fats, Oils and Grease (FOG)
- Provides cradle-to-cradle economic model:
 - Harvest urban “crop” for the local fleet.



Benefits of Waste Derived Biodiesel (cont'd)

- Protects Workers
 - Biodiesel is less toxic than petroleum-diesel
- Splash blend of Bio and Petro-diesels
 - No need to retrofit your diesel engine fleet
- Provides for Co-location
 - Both supply of grease and demand for fuel in close proximity
- Meets your Climate Action Plan
 - Creates up to 80% less green house gases than diesel #2
- Achieves Public Environmental Education Impacts
 - More people in urban areas can learn from these community based programs



Little Known Fact



Dr. Rudolph Diesel designed the diesel engine in 1892 to run on peanut oil:

“The use of vegetable oils for engine fuels may seem insignificant today. But such oils may become in the course of time as important as petroleum and the coal tar products of the present time.”

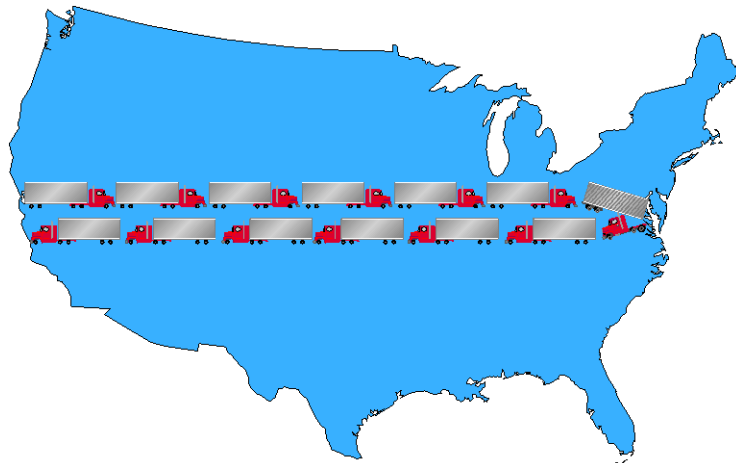


Why Focus on Waste Cooking Oil?

- EPA's Resource Conservation Challenge (RCC)
 - Reduce waste, and reuse and recycle
 - Recover energy lost in waste going to landfills
- U.S. Restaurants generate up to 3 billion gallons of waste cooking oil annually (U.S. EPA OSWER)



San Francisco

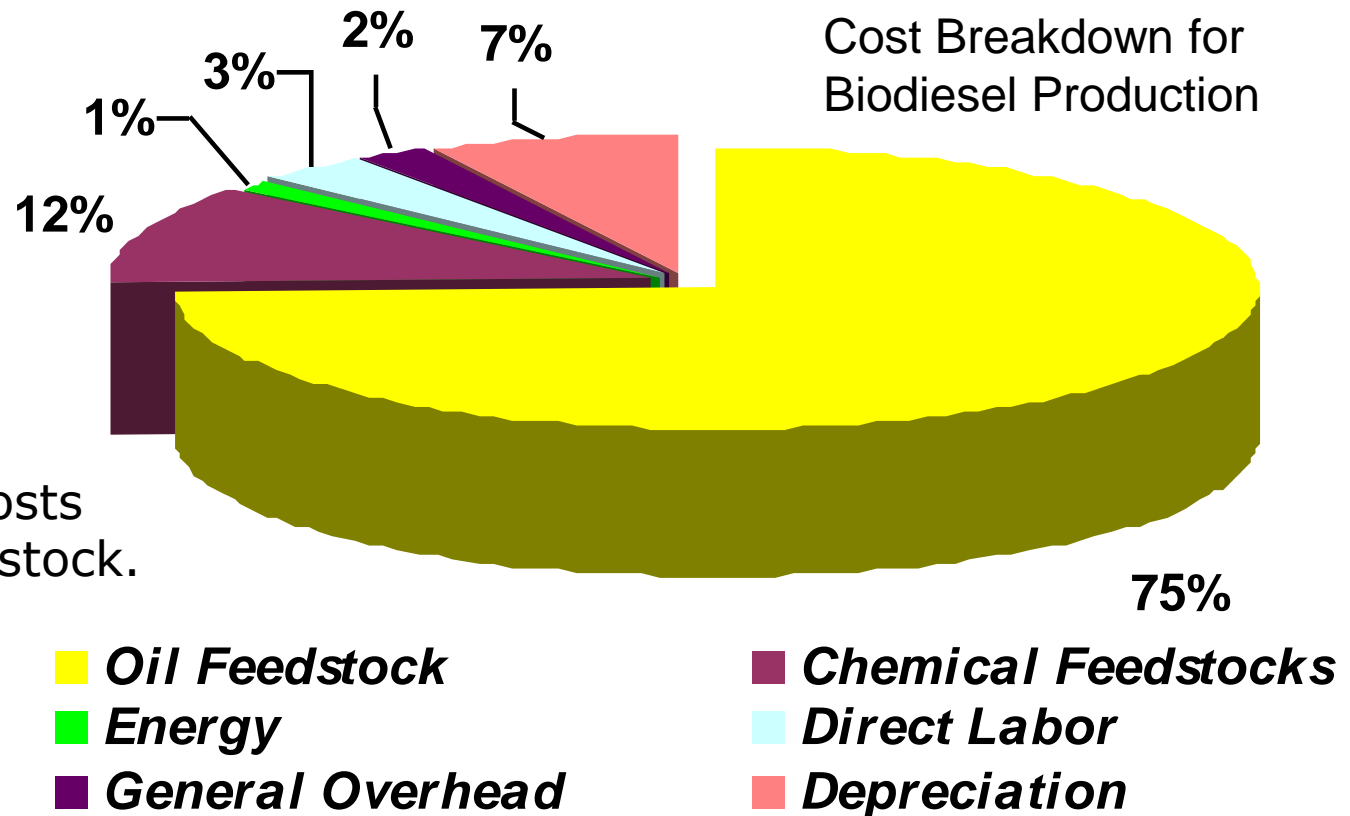


3 billion gallons = 5,700 miles
of tanker trucks end-to-end



New York

What are the Cost Benefits of Waste Cooking Oil?



$\frac{3}{4}$ of production costs are in buying feedstock.

How can Biodiesel Solve Waste and Water Pollution Problems?

By converting waste grease to a fuel commodity

- Diverts large waste stream from:
 - Landfills or illegal dumping
 - Publicly-owned treatment works (POTWs)



- Prevents spills and sewer blockages:
 - 80% of sewer spills in the USA are caused by FOG (US EPA Office of Water)
 - In a year, Los Angeles had about 800 sewer spills, due to pipes clogged by FOG





***Flexible
Biodiesel Models
from West Coast
Communities***

Santa Cruz Project

Urban Biofuels Initiative Final Report: A Guide for Coordinating a Fryer to Fuel Collection Program in Combined Urban/Suburban Areas



Fryer to Fuel

COLLECTION PROGRAM

The Fryer to Fuel (F2F) collection program is a FREE weekly service provided to restaurants throughout Santa Cruz County. The program was developed in collaboration with environmental agencies, food service industry and liquid waste haulers with funding from the United States EPA Urban Biofuels Initiative. Collection of used fryer oil for biodiesel production offers many benefits to the community including: improved water quality, reduced fossil fuel use, economic opportunity, and free grease disposal for restaurants.

Santa Cruz Model for other Cities



Fryer to bin to grease hauler for rendering to manufacturer for processing into biodiesel to distributor for blending and distribution to public fleets

Commercial Biodiesel Business Model

Recipe

Dish: Locally-produced, sustainable biodiesel

Serves: B5, B20 or B50 for local public fleets for a population of 150,000 people

Ingredients:

- At least 100,000 gallons of waste grease/year generated by about 200 local restaurants.
- Commercial biodiesel plant within 200 miles.
- Liquid waste hauler(s) servicing local restaurants with truck(s) and containers.
- Public or commercial fleet(s) using diesel.
- Champion: Environmental or sustainability professionals within the public domain to motivate.
- Local environmental compliance inspectors regulating fats, oil, and grease from restaurants.



Public Model (San Francisco)

- EPA assisted in developing biodiesel plan with diverse, unconventional stakeholders:
 - Dept. of Environment, City Public Utility Commission, Biofuels Co-op, Municipal Transit Agency, City College, consultants
- West Coast Diesel collaborative grant means that SF is the largest city in the US to convert its whole municipal fleet to biodiesel
- Part of Mayor's goal to convert whole city fleet to B20 (8 million gallons of diesel/year)



“San Francisco - Bridging the Biodiesel Gap”



- \$200,000 in EPA funds
- \$515,000 leveraged from partners
- City College developing biodiesel curriculum
- Also supports refueling infrastructure and testing of local fleets
- Additional partners include People's Fuel Cooperative, Community Fuels, SF Environment, Royal Petroleum

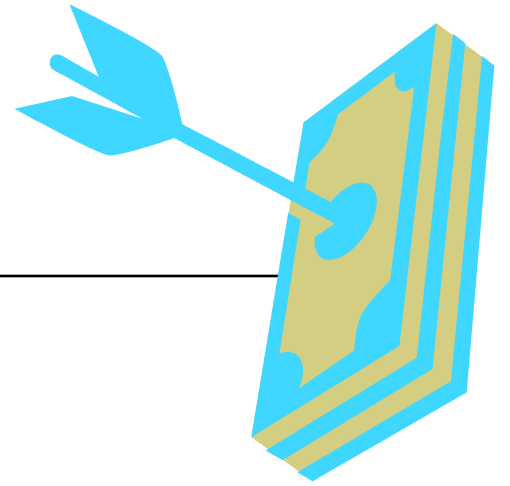
Big City versus Mid-size

Current Status (Oct08)	SFGreasecycle (San Francisco)	Fryer to Fuel (Santa Cruz)
Budget	\$1.2 million	\$75,000
Number of Participating Restaurants	500	30 (highest volume restaurants)
Total Number of Restaurants in Area	2600	Approximately 1000
Geography	Dense urban	Suburban/urban/ rural combination
Staff	3 Full-time employees	1 full-time employee for the duration of the grant, work absorbed by existing public works staff, Environmental Compliance Inspectors
Number of liquid waste haulers picking up fryer oil in region	More than 10.	Less than 3 licensed haulers, one main hauler.
QA/QC requirements	Same requirements as private enterprise (below)	None for government, borne by private entities (below).

Legal Model (Portland, OR)


- Ordinance with mandatory goals 16.60.020 Biofuel Requirements. (Amended by Ordinance No. 180671, effective January 12, 2007.)
- Goals:
 - Summer 2007 B5 for all retailers
 - By July 1, 2010 B10 throughout Portland
- 50% of the biodiesel sold in Portland needs to come from either:
 - Recycled feedstock: used cooking oil, or
 - Local agriculture: Canola, Flax, Sunflower or Safflower
- Biodiesel produced from a **imported palm oil may not be used** to satisfy the requirements of this Chapter.
- http://www.oregon.gov/ENERGY/RENEW/docs/Final_Portland_Biodiesel_Ordinance.pdf






Resources for Sustainable Biodiesel

Resources for Restaurants from Santa Cruz Project




6 Steps for Fryer to Fuel Waste Oil Maintenance & Storage


Step 1
ONLY WASTE FRYER OIL in the bin:



Fryer Grease OK



No Stove-top Grease Waste




No Grease Trap Waste

Step 2
Keep storage container lid closed and locked at all times.

Step 3
Make sure oil is free of solids. Skim fryer if necessary.

Step 4
Always transport waste fryer oil in a container with a lid.



Step 5
Never contaminate Fryer to Fuel grease with excessive moisture or solids.

Step 6
Never contaminate exterior storage areas with grease spillage. If a spill occurs, immediately wipe it up with a shop rag.



Programa de recolección de aceite de la sartén para convertirlo en biodiesel

El programa de recolección de aceite de sartén para convertirlo en biodiesel (Fryer to Fuel - F2F) es un servicio semanal GRATUITO, proporcionado a los restaurantes del condado de Santa Cruz. El programa, desarrollado en colaboración con las agencias medioambientales, la industria de servicios alimentarios y los transportadores de desechos líquidos, ha sido financiado por la EPA Urban Biofuel Initiative de los Estados Unidos. La recolección de aceite de cocina usado para la producción de biodiesel ofrece muchas ventajas a la comunidad que incluyen: una mejor calidad del agua, una disminución del uso de combustibles fósiles, oportunidades económicas y servicio gratuito de desecho de basura para los restaurantes.

1 ¿ADEMÁS DE LA RECOLECCIÓN GRATUITA DEL ACEITE, CUÁLES SON LAS OTRAS VENTAJAS PARA MI NEGOCIO?

Con la inscripción en el programa de recolección "F2F", su restaurante aparecerá publicado en los periódicos locales, usted podrá utilizar los logos de "F2F" que destacan el compromiso de su restaurante con el uso de combustibles alternativos y podrá satisfacer una percepción significativa de los criterios del programa de negocios verdes del área de la bahía de Monterey o "Monterey Bay Area Green Business Program".

2 MANTENIMIENTO Y ALMACENAJE DEL ACEITE DE SARTÉN:

El programa y los socios de "F2F" proveerá gratuitamente a su cocina o negocio los envases para el almacenaje externo de grasa. Estos envases tienen tapas bloqueables y rejillas en ángulo para la extracción de sólidos. Los envases y la recolección gratuita serán proporcionados mientras se cumpla con los requisitos de manejo y almacenaje.



3 ALMACENAJE EXTERNO

Además de separar el aceite de sartén de otros desechos del restaurante, tenga cuidado al vaciar el aceite al envase de almacenaje externo. Por favor, no contamine los alrededores con derramamiento de grasa. En la ciudad y en el condado de Santa Cruz, es ilegal verter grasa desechable o grasa marrón de las rejillas por los drenajes.

4 COMO MIEMBRO DEL PROGRAMA, SU COCINA DEBE MANTENER EL ACEITE DE SARTÉN SEPARADO de otras grasas que se usen y seguir las pautas específicas resumidas a continuación:

- SOLAMENTE EL ACEITE DESECHABLE DE SARTÉN debe ser vertido en el envase mantener
- siempre la tapa del envase cerrada y bloqueada
- no permitir que exceso de agua, de humedad o de sólidos se introduzca en el envase externo de grasa
- entrenar a todo el personal de cocina en los requisitos de almacenaje para el programa de recolección "F2F"
- utilizar un envase con tapa para transportar el aceite de sartén al almacenaje externo y verter la grasa lentamente y con cuidado para reducir al mínimo la posibilidad de derramamiento.

5 RECOLECCIÓN

El programa "F2F" colabora estrechamente con los transportadores de grasa para lograr que la recolección se haga, en lo posible, sin problemas. La grasa será recogida en las rutas designadas. Esto significa que si el aceite de sartén de una cocina sale contaminado, podría contaminar la carga entera. El horario de la recolección será establecido durante el proceso de solicitud.



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Biodiesel

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Biodiesel: Fat to Fuel

Biodiesel is an alternative fuel produced from domestic, renewable resources. It is safe to use in any diesel engine and is more sustainable and far less polluting than conventional petroleum diesel. Biodiesel

significantly reduces asthma-causing soot, greenhouse gases, carbon dioxide, and sulfur dioxide in air emissions. Along with creating less pollution, biodiesel is simple to use, biodegradable and non-toxic. Produced from renewable resources such as waste cooking oil or soybean oil, biodiesel reduces dependence on limited energy resources and foreign oil. The "fat to fuel" process recovers energy and recycles waste oils that are either dumped in landfills or flushed down drains, clogging pipes and causing costly sewer spills.

'Thanks to this project, yesterday's French fry grease is tomorrow's truck fuel.' -Jeff Scott, EPA R9 Waste Mgmt. Division Director

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- EPA Region 9 Biodiesel Page
 - Stories from AZ, HI & NV
 - Resources
 - Funding, Grants

Sustainable Biodiesel Resources



- Sustainable Biodiesel Alliance (SBA) Criteria Catalogue in the US
 - <http://www.sustainablebiodieselalliance.com/welcome.html>
- Renewable fuel standards developed by USEPA, and California Air Resources Board
 - <http://epa.gov/otaq/renewablefuels/index.htm>
 - <http://www.arb.ca.gov/fuels/lcfs/lcfs.html>
- Roadmap for Biodiesel facilities covering all environmental laws
 - Will be released in mid-November
- International Biofuels Roundtable
 - <http://cgse.epfl.ch/page65660.html>
- Popular resources such National Geographic Magazine "Green Dreams"
 - <http://ngm.nationalgeographic.com/2007/10/biofuels/biofuels-text>

Summary: Benefits of Waste-derived Biodiesel

- Environmental (Air, Water, Waste)
- Energy Independence (Domestic, Renewable Fuel)
- Economic/Cost (Waste to Fuel)
- Green Local Business Model
- Improved Safety

EPA Region 9
Earth Day Awardee
Willie “BioWillie” Nelson



Take home message:



- Biodiesel from used fryer grease has great potential as clean, alternative fuel
- Cities can serve as catalyst to help local biodiesel production
- It takes only a few ingredients to make it happen!

Thank you



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