Biodiesel WEBINAR

gov - the Policy Perspective
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Why is EPA Working on Biodiesel?

• “Advanced Energy Initiative: national goal of replacing more than 75% of our oil imports by 2025…
• Biodiesel will help end dependency on foreign oil …
• Foreign oil will go the way of typewriter and walkman…
• Restaurant grease which would normally be thrown away, will be turned into fuel…
• Biodiesel is making the black puff of diesel smoke a thing of the past. “

U.S. EPA Administrator Steve Johnson
Why Pacific Southwest?

To reduce particulates in our air!
Diesel Emissions Pose a Significant Environmental Health Problem

• Diesel exhaust
  – Serious health impacts
    • exacerbates asthma,
    • respiratory & cardiac illness
  – Possible human carcinogen
    • over 70% of the cancer risk from all air toxics
  – Degrades air quality
    • Particulate Matter
    • Ozone
  – Contributes to climate change
EPA’s Diesel Regulations

- Clean Diesel Truck/Bus Rule: Dec 2000
- Clean Air Non-road Diesel Rule: May 2004
- ULSD for highway diesel engines: 2006
- Low sulfur diesel for non-road engines: 2007,
- ULSD for non-road engines: 2010, and
- ULSD for locomotives and marine engines: 2012.

- When fully implemented in 2030, this will **annually prevent** up to:
  - 2,000 premature deaths,
  - One million lost work days,
  - 15,000 heart attacks and
  - 6,000 children's asthma-related emergency room visits

- Combined, these stringent regulations will achieve
  - $150 billion in health benefits
But what can be Done with the 11 Million Diesel Engines in Use today?
Enter: Biodiesel

- Domestic, renewable fuel
- Only alternative non-fossil fuel that passed the Clean Air Act Tier I and II health effects testing
- Reduction of virtually all regulated air emissions (60% reduction of asthma causing PM, nearly 80% reduction of green house gases, 100% reduction of sulfur oxides causing acid rain)
- Great potential for resource conservation: used frying oil (UFO) can be converted to biodiesel
- Non-toxic and biodegradable -- no need for Exxon-Valdez type spill cleanup
Benefits of Waste-derived Biodiesel

- **Conserves Resources**
  - Up to 3 billion gallons of waste grease generated in the US/yr

- **Recovers High Yields of 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)

- **Reduces air emissions**
  - 86% reduction of GHG emissions for biodiesel derived from waste oil feedstock based on lifecycle analysis for the renewable fuel standard (RFS-II)
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High Energy Yield in FOG (Fats-Oil-Grease)

(Courtesy of M-Con Bio and Farmatic Biotech Energie AG, Yields in m³ gas/ton)
Life Cycle Analysis for Biodiesel
Left: Soybean Oil - Right: Waste Grease

LCA shows great fossil energy ratio benefits:
- Petroleum Diesel: 0.8
- Soybean Biodiesel: 3.2
- Yellow Grease Biodiesel: 4.6 – 6.4

Reproduced from Sheehan et al., 1998
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What are the Economic Benefits?

Waste cooking oil may reduce biodiesel production costs by 75% when compared to virgin oil.
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Waste Grease to Biodiesel or Anaerobic Digester

- **Energy** derived for producing biodiesel is greater than for producing electricity through anaerobic digestion (1120 versus 1010 KiloJoule/Liter).

- Net **greenhouse gas emission** reductions are substantially greater for biodiesel production than AD (0.48 versus 0.23 kg CO2/L).

- **Economic** benefits of producing biodiesel may be greater over the long term than producing electricity through AD capacity.

- Many organic wastes are suitable for **ADs**, however few are suitable feedstock for **biodiesel**.
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Air Quality: Emission Difference between Biodiesel and Petrodiesel

Source: Draft EPA Report EPA420-P-02-001
Benefits of Waste-derived Biodiesel (continued)

• **Closed-loop economic model**
  – In urban settings, FOG is an urban “crop” to be harvested and used locally in a sustainable cradle-to-cradle fashion.

• **Co-location of supply and demand**
  – Fats-Oil-Greases are generated in large quantities in locales such as universities, wastewater treatment plants, military bases, corporate campuses where demand for fuel is high as well (large fleets).

• **Community based – “by-product synergy”**
  – One industry’s waste (restaurant grease) is another’s feedstock (biodiesel manufacturer) providing for beneficial use of a by-product.

• **Public environmental education impact**
  – Higher population density in urban centers allows for environmental education from community based programs.
Resources/Funding/Grants

A centralized site for all Federal Grants
www.grants.gov

Federal Sustainable Transport Program, e.g. Clean Cities
http://www.westcoastdiesel.org/programs.htm#federal

State of California Grants, e.g. Alternative and Renewable Fuel and Vehicle Technology Program by CEC
www.getgrants.ca.gov

California Integrated Waste Management Board's Grant Writing Tips
http://www.ciwmb.ca.gov/Grants/Tips.htm

EPA Grant Writing Tips
http://www.epa.gov/ogd/recipient/tips.htm
Thank you

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http://www.epa.gov/region9/biodiesel