What is Biodiesel?

A renewable fuel commercially refined from a diverse array of fats and oils by-products & used in normal diesel engines.

Iowa and Illinois produce approximately 70% of biodiesel in the U.S.
America’s Advanced Biofuel

• Biodiesel is America’s first domestically produced, commercially available Advanced Biofuel and meets EPA requirements for inclusion and use under the new Renewable Fuels Standard (RFS-2).

• **EPA Definition 40 CFR 80.1401** - *Advanced Biofuel* means renewable fuel, other than ethanol derived from cornstarch, that has lifecycle greenhouse gas emissions that are at least 50 percent less than baseline lifecycle greenhouse gas emissions.

• Biodiesel production is guided by stringent ASTM fuel specifications, developed through years of testing.
Feedstock Options
EPA approved pathways or those under review

Biodiesel Feedstocks

- Canola Oil 13%
- Recycled Oils 10%
- Distillers Corn Oil 5%
- Animal Fats 20%
- Soybean Oil 52%

- Corn Oil from DGS
- Animal Fats
- Palm Oil
- Yellow Grease
- Soybean Oil
- Canola Oil

Feedstocks
Protects Environment

- Reduces Emissions
- Biodegradable
- Nontoxic
- Displaces Petroleum
• U.S. biodiesel reduces lifecycle carbon emissions by 57% – 86% compared to petrodiesel, qualifying it as an Advanced Biofuel under RFS-2 and making it the best carbon reduction tool of any liquid fuel commercially available.

– Biodiesel from Waste Oils, Waste Grease and Animal Fats
  = 86% reduction in GHG Emissions

– Biodiesel from Soy based oils
  = 57% reduction in GHG Emissions
**Better For Your Health**

- **Biodiesel is:**
  - Biodegradable
  - Nontoxic:
    - LD50 =17.4 g/Kg - less toxic than table salt
    - Skin irritation less than that of 4% soap and water solution
  - **Safer to handle:** Flash point above 200 Degrees F, Non-Reactive, Non-Corrosive

- **Compared to petrodiesel,** biodiesel reduces black smoke (particulates), Carbon Monoxide, and harmful unburned hydrocarbons that cause smog.
Biodiesel has the highest energy balance (5.54 : 1) of any commercially available fuel, returning 5.54 units of renewable energy for every 1 unit of fossil energy needed to produce it.

- Grew to 5.5 due to improved farming
- Refining & transporting petroleum 0.8
Energy Security

• Biodiesel production reduces our dependence on foreign oil from unstable parts of the world, while expanding and diversifying our domestic refinery capacity.

• Biodiesel is the most economical option for turning oils and fats into usable fuel diesel applications:
  – **Low capital cost for facilities**
  – **Low processing costs**
    • 80% of product cost is from oil/fat
Economic Benefits

• Biodiesel helps our U.S. economy and improves our balance of trade.

• Using biodiesel creates added outlets for farm based products and high paid manufacturing jobs in rural parts of our country.

• The 1.1 billion gallons of biodiesel produced in the U.S. in 2011 also supported over 39,000 U.S. jobs.
Biodiesel is produced from a variety of renewable resources, such as plant oils, animal fats, recycled grease, and even algae, making it one of the most sustainable fuels on the planet.

With biodiesel, you don’t sacrifice food for fuel. Oils and fats for biodiesel are a minor by-product of producing food for humans and animals.

- Soybeans are 80% protein, 20% oil
- No one grows livestock for its fat content
- No one cooks more fried food to get used oil for biodiesel
World Soybean Production - 2012/13

- United States, 28%
- Brazil, 31%
- Argentina, 21%
- China, 5%
- India, 4%
- Canada, 2%
- Paraguay, 3%
- Others, 5%

Source: USDA
In the last five years, due to the transfat issue, the share of soybean oil used domestically dropped from 84% to 65%.

(10/13/11, U.S. Department of Agriculture Economic Research Service Oil Crops Outlook report)

Exports and domestic use for soybean oil was flat in 2010 and in 2011. Despite this, the price of soybean oil is approximately 53 cents per pound.

Over the last five years, biodiesel has brought U.S. soybean farmers an additional $2.7 billion in net returns.

(1/11, Centrec Consulting Group LLC)
Soybean Yields

Soybean Yield

United States of America
Least Developed Countries
South America
World Soybean Importers - 2012/13

- China, 65%
- EU-27, 12%
- Mexico, 3%
- Japan, 3%
- Others, 17%

Source: USDA
WORLD’S LARGEST SOYMEAL CONSUMERS IN 2011/2012

- China: 46.46 MMT
- EU-27: 30.45 MMT
- United States: 28.03 MMT
- Brazil: 13.94 MMT
- Mexico: 4.33 MMT
- Thailand: 3.88 MMT
- Japan: 3.80 MMT
- India: 3.38 MMT
- Indonesia: 2.89 MMT
- Iran: 2.55 MMT
- Vietnam: 3.24 MMT
- Korea, South: 2.27 MMT
- Russia: 2.21 MMT
- Egypt: 1.98 MMT
- Philippines: 1.96 MMT
- Canada: 2.04 MMT
- Taiwan: 1.74 MMT
China Vice President Xi Jinping Visits Iowa
U.S. Soyoil Consumption For Food/Feed and Industrial Use
2000/10 – 2010/11 and USDA Forecast for 2011/12

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Soybean Meal Use by Livestock

- Poultry: 49%
- Swine: 25%
- Beef: 12%
- Dairy: 8%
- Petfood: 3%
- Other: 3%
Soybean Plantings are NOT driven by Biodiesel

- Protein meal for livestock feed is the **primary** driver for soybean production.

- Better utilization of the oil coproduct can reduce the price of the protein meal.
What Crop to Plant?

• What grows well in my soil?
• What grows well in my climate?
• What equipment do I own?
• What will commodity prices be next year?
• What are the input costs for each crop?
• What infrastructure exists to market my crop?
• What crop insurance is available?
• What did I grow last year?
  – Rotation to build soil nutrients, moisture, interrupt pests, etc.
Increased efficiencies = **LESS ENERGY**
being utilized per bushel and per acre:

- No-till techniques for soybeans, Strip Till, Minimum till
- Equipment improvements from planters spanning 10 feet to modern planters covering 60 feet or more
- Seed technology advances causing fewer passes through field
- Reduced on-farm energy use by 20% in last decade.
SOYBEANS-SUMMARY

• Soybeans are part of a system
  – Rotation with corn
  – Producing protein for livestock

• Technology optimizes yield
  – Precision application of fertilizer
  – Conservation tillage
  – Crop scouting to identify pest management

• Efficient storage & transportation
  – Fungibility essential to economic viability
• Key Federal Policy
  – Federal Blenders Credit – creates price volatility cushion for industry
  – Renewable Fuel Standard – creates floor for biodiesel producers

• Key State Policies
  – Function to create opportunities for growth in specific states
  – Insurance policy if federal policy changes
States Incentives and Mandates

• 32 states have biodiesel incentives
  – Very diverse, and provides different types of incentives from building infrastructure to creating customer demand by putting the incentive at the retail level

• 35 states have requirements for use of biodiesel in some capacity, mostly state fleets but some retail incentives
RFS-2 mandates 36 billion gallons of renewable fuel be used by obligated parties (i.e. refiners) by 2022:
- 1 billion gallons biomass-based diesel,
- 4 billion gallons un-differentiated advanced biofuel.
Additional Threats to RFS2 Program

- **Legislative:**
  - Avoid Legislative Re-opening of RFS2 Program.
  - RIN Integrity.

- **Litigation:**
  - Interventions to Defend Program/Stability.
    - Under constant threats from petroleum producers and their trade organizations.
Biodiesel Infrastructure & Use

• Biodiesel and biodiesel blends are now available nationwide, dispensed through existing fueling stations
• Using Biodiesel is easy!
• B20 and lower blends are a drop-in replacement for diesel fuel; no vehicle modifications needed
• Can be used in any diesel engine / vehicle according to OEM’s recommendations
Biodiesel: An “Advanced Biofuel” Available Now

205 EPA-Registered plants nationwide with over 3.08 Billion GPY Capacity
• States’ Adoption of ASTM D6751 into law
  2011: 48 states (AK, NJ remain)

• Active Enforcement
  2011:
  – 36 states have authority to regulate fuel quality
  – 20 states do proactive testing
All 2011 MY and beyond GM Heavy Duty Products are approved for B20:

- Chevrolet Silverado
- GMC Sierra
- Chevrolet Express
- GMC Savana
New Chevy Cruze diesel passenger car coming in 2013

- Biodiesel blend approval TBA
- We are working with GM to confirm B20 support for this vehicle upon launch
OEMs Supporting B20+
Questions/Resources

- www.iasoybeans.com
- www.iowabiodiesel.org
- www.unitedsoybean.org
- www.biodiesel.org

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