

Biodiesel Use in Madison's Fleet **Summary Findings**

Reductions in CO₂ with Transition to Biodiesel Blends in Madison's Diesel Fleet

Mix	Carbon Dioxide Reduction (Tons)	Percent
B5	800	~ 4
B20	3,000	~ 15
B100	17,000	~78

Effects of Biodiesel on Agricultural Land Use and Water Quality

- Soybeans feedstock is one of the most common for biodiesel and soybean cultivation constitutes nearly 18 percent of Wisconsin's 2.5 billion-dollar crop agriculture industry.
- The drive to use biofuels may render previously marginal lands economically viable and encourage more intensive cropping or a change in rotation patterns
- Biodiesel produced from soybeans has a significant advantage over corn ethanol
 - Demands for irrigation water are lower for soy than for corn
 - Demands for chemical fertilizers and pesticides are dramatically lower
 - Soy production requires 99% less nitrogen, 92% less phosphorus, and 87% less pesticides than corn
 - Phosphorus from agricultural run-off is primarily responsible for the water quality problems in Madison's lakes
- However, soybean-only cultivation can reduce agricultural yields due to increase in soy-specific pests and diseases and, compared to corn, soybean cultivation makes soil erosion more likely
- Due to the potential drawbacks for soy-only cultivation, markets should encourage longer-term thinking and a focus on crop rotations.

Sourcing Biodiesel from Non-Virgin Feedstocks

- A feedstock that major municipalities are considering is waste vegetable oil or "yellow grease"
- San Francisco, CA has a "Greasecycle" program to collect waste vegetable oil from residents and businesses
 - The city offers the service for free as the cost of pickup, transport and processing is less than buying virgin biofuels; other benefits for the city include reduced sewer repair and cleaning
- The Stagecoach group in the UK has a "bio-bus" initiative in which customers can exchange used cooking oil for reduced bus fares; this program is expected to have a carbon reduction of around 1,000 tons/year
- Madison can expand its current collection system to restaurants and businesses

Biodiesel and Public Health

- A transition to biodiesel and biodiesel blends can reduce the level of criteria emissions and air toxics
- However, as the proportion of biodiesel used in fuel blends increases, so do emissions of NO-x, a documented respiratory irritant
- Reduction in emissions contributes to a lower risk of cancer
- There could potentially be reductions in:
 - Acute respiratory and cardiopulmonary hospital admissions
 - School and work absences
 - Medication use among asthmatics and others with compromised respiratory conditions
 - Chronic bronchitis, irregular heartbeat, heart attacks
- Biodiesel blends below B20 and limited (local) use will likely have a negligible benefit to public health
- Expanded use of biodiesel could have significant, positive results for the public's health