

Internal Combustion Engines and Alternative Fuels (ICEAF) Committee
Of the USDA Agricultural Air Quality Task Force
2007 – 2008 Work Plan

The ICEAF Committee members developed a list and then ranked that list to set priorities for this Committee to provide meaningful work products prior to or by August 2008. The Committee established the following topics for focused work: (1) impacts (positive and negative) of biofuels production from crops; (2) impacts (positive and negative) of alternative fuel generation from animal manure; and, (3) impacts (positive and negative) of alternative fuels on internal combustion engines with particular focus on internal combustion engines used in agricultural production.

The Committee supports the development of alternative energy forms and energy conservation for many reasons, such as the unstable supply of oil to produce gasoline, diesel and other constituents from crude oil supplies. The Committee also supports solutions that minimize harm to the environment.

The development of biofuels is largely dependent upon crop production and/or waste products from animal production. There is a general lack of science relative to emissions from the combustion of biofuels. The ability to generate a market for alternative fuels is reliant upon equipment and automobile manufacturers' design of new internal combustion engines or the retrofit of existing internal combustion engines.

In order to present the most in-depth set of intended and unintended consequences from alternative fuel production and use to the AAQTF, the following topics will be examined (but are not limited to):

- Siting criteria
 - Location to nearby towns
 - Availability and close proximity of fuel stock
 - Availability of potable water
 - Condition of potable water (will water require treatment prior to use?)
 - Is the wastewater brine-laden?
 - Where will discharge water go?
 - Where will solid and hazardous wastes go?
 - Availability of electricity
 - Availability of natural gas
 - Previous Conservation Reserve Program (CRP) land?
 - Does site have minimal soil quality requiring extraordinary measures to render to “acceptable” for a construction site?
 - What is the increased use of fertilizer in biofuels crop production?
 - Soil erosion possibilities?
 - Availability of construction companies with expertise in biofuels plant construction
 - Is there an existing road infrastructure to support this facility?
 - Will the facility have to maintain a road infrastructure for this facility?
 - Will the facility have dirt, gravel, or paved roads on the property?

- Is there additional land for expansion?
 - Destruction of wildlife habitat
 - Storage of biomass
- Fuel Stock
 - What is range of distances (miles) to fuel stock supply(ies)?
 - What is the fuel stock?
- Transportation to and from the site by vendors, employees, others.
 - What methods (truck, rails, pipeline, other) will be used to transport fuel stock to the site?
 - What methods (truck, rails, pipeline, other) will be used to transport alternative fuels from the site?
 - What methods (truck, rails, pipeline, other) will be used for other supplies needed at the facility?
 - What transportation methods used for vendors and employees?
- Permits
 - Construction – Air permits (state or federal) – obtaining an air quality permit in one state may not be the same as obtaining an air quality permit in another state
 - VOCs
 - NOx
 - Sox
 - HAPs
 - Odors
 - Must meet Maximum Achievable Control Technology (MACT) and New Source Performance Standards (NSPS) – 40 CFR 60 Subparts Db, Dc, Kb, Y, DD, VV, IIII, and NESHAP Regulations subparts Q, FFFF, ZZZZ, and DDDDD
 - Levels of acetaldehyde emissions may trigger major source thresholds under HAPs
 - Construction – local permits
 - Wastewater discharge – (state and/or local)
- Consumptive Fuel Use and Emissions From Each Fuel
 - Natural Gas
 - Electricity
 - Coal
- Carbon Issues
 - Carbon balance
 - Carbon credit
 - Determination of credits
- Green House Gas Issues
- Unintended Consequences
 - Change in nutrient management for poultry, beef, dairy, swine operations using “waste” products from ethanol production
 - Use of Ethanol and/or biodiesel possibly contribute to a higher production of NOx and HAPs than in gasoline or diesel

- Emergency Response – Explosions of rail cars; change in first responders approaches at an accident scene; clean up of spills;

Biofuel Production and Waste-to-Energy Production

- Nitrogen use efficiency
- Production techniques
- Characterization of emissions from waste-to-energy production facilities by waste stream and identification of data collection needs
- Drought tolerant crops (water use issues)
- Exploring different varieties of fuel crops (see White Paper)
- Energy efficiency of production systems

Internal Combustion Engines Used in Agriculture

- Examine fuel alternatives for agricultural equipment (predominantly diesel) and environmental benefits and disbenefits.

SPECIFIC WORK PRODUCTS TO BE DEVELOPED:

- (1) An assimilation of the state-of-the-science for biofuel and waste-to-energy production and process emissions (requires the part-time loan of USDA research librarian);
- (2) Evaluation of impacts (positive and negative) of increased biofuel production;
- (3) Recommendations to USDA Secretary:
 - a. Biofuel and waste-to-energy research priorities
 - b. Best management or conservation practices
 - i. efficient fertilizer use
 - ii. land and crop management
 - iii. on-farm fuel use
 - iv. strategies for agriculture production to meet the demand for resources to produce biofuel production
 - v. on-farm use of biofuels
- (4) Using the information acquired in (1) and (2) above, develop a multi-media (air, water, waste), multi-disciplinary (policy and technical) meeting held in the time frame of May-July 2008 to achieve the following objectives:
 - a. To explore commonalities of national issues relative to the production of biofuels;
 - b. To develop a list of policy issues that require intervention from environmental regulatory agencies, agricultural agencies, and the industry;
 - c. To develop a list of technical issues that require intervention from environmental regulatory agencies, agricultural agencies, and the industry;
 - d. To establish voluntary, national workgroups to develop policies and technical recommendations to address deficiencies or inaccuracies in existing policies and technical approaches; and
 - e. To establish a link on several websites to make available conference information, work products and workgroup products.