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The time is right for ethanol and biodiesel development in Montana

Presentation to Energy and Telecommunications Subcommittee
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Montana Department of
ENVIRONMENTAL QUALITY

What is Ethanol?

- Ethanol is a clean burning, renewable, domestically produced product made from fermented agricultural products such as corn, wheat and barley
- Ethanol contains oxygen, which helps gasoline burn cleaner and more efficiently

Low Cost Oil is Gone or Soon Will Be!

- Increasing demand for oil from third world nations
- Political unrest in nations with large oil reserves
- Oil production is at or near its peak for easy production

Federal Air Quality Standards That Favor Ethanol Use

- Reformulated gasoline (RFG) for non-attainment areas
- Low sulfur gasoline requirements (2006-2007)
- Proposed Renewable Fuel Standard (RFS)-oxygen standard

Ethanol Use In Montana

- **500 million gallons of gasoline sold annually**
- **18 million gallons of gasoline blended with ethanol**
  - **3 million gallons of fuel (straight) ethanol**
  - **E10 available at approximately 50 retail locations**
  - **E85 available in Helena and West Yellowstone**
  - **E8 used in Missoula in the winter**

Ethanol Use Nationally

Nationally 30% of all gasoline sold contains ethanol

- **Montana 4%**
- **North Dakota 30%**
- **South Dakota 50%**
- **Minnesota 100%**

What Ethanol Production Needs In Montana

- Financing - capital
- Availability of starch and sugar – wheat, barley, corn. Long term potential to use wood, straw and paper sludge
- Rail and highway access for feedstock and products
- Markets for co-products – distillers grains, wheat gluten and carbon dioxide
- Stable energy costs for power and fuel for processing

Proposed Plants in Montana

- Agri-Fuels – Great Falls
  - 100 mgy, wheat, barley – wheat gluten (by-product
- Rocky Mountain Ethanol – Hardin
  - 60 mgy, corn, barley - feed
- 3-5 other potential plants

Opportunities Offered by Ethanol

- Support existing agricultural economy---Grain crops and cattle
- Add value to Montana grain by converting to ethanol
- Increase Montana animal feeding operations with co-products
- Eventually develop new uses for wheat straw and wood
- California and Washington MTBE ban requires ethanol for blending
- New York, Connecticut, and New Hampshire MTBE bans will require ethanol from the mid-west for blending
- A 10 % blend of ethanol (E10) reduces regulated vehicle emissions by 10 to 21 percent
- Ethanol-blended fuels reduces greenhouse gas emissions by 12-19% and toxic emissions by 30 %

Challenges

- Low cost grain – Montana produces more wheat, barley and less corn
- Markets for co-products – Montana has few year round feed lots
- Transportation – Rail is expensive
- Financing – Must compete nationally and need stable incentives

Federal Incentives

- **One time payment for new production (Farm Bill-USDA CCC program – dependent on annual appropriation, 2005-2006**
- **Producer Tax Credit - $0.51 per gallon of ethanol, 2005 – 2010**
- **Executive Order for GSA federal fleet to reduce petroleum use by 20%**

Montana Ethanol Incentives

- Producer Incentive
  - **$0.30 per gallon**
  - **up to $3 million per producer per**
  - **$6 million total**
  - **sunsets in 2010**
- Consumer Incentive – Effective after Montana plant is operational. Fifteen (15) percent reduction in state excise road tax for E10. Incentives for 4 years after production begins. Incentive does not apply to E-85.

Challenges

- National markets are not as developed as ethanol
- Idle production capacity nationally
- Financing-must compete nationally and needs stable incentives
- Low cost and high yield oil crops need further development
- Different vegetable oils result in different performance

Federal Biodiesel Incentives

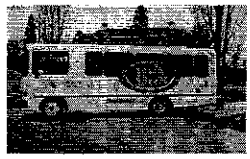
- **GSA federal fleet mandate to reduce petroleum use by 20% by 2010**
- **One time payment for new production (Farm Bill-USDA CCC program – 2005 thru 2006)**
- **Federal excise tax exemption of 1 cent per 1% of blend up to 20 cents**

What other states are doing

- **Producer Incentives from 5-30 cents per gallon**
- **Consumer Incentives - reduced tax on fuel or dispensing equipment**
- **B-2 (Low-Blend) mandate**
- **Low Interest Revolving Fund**
- **Bond Programs to purchase vehicles and infrastructure**

Biodiesel Use In Montana

- B-20 commercially available at 3 retail locations
- B-20 used in UM campus bus and other fleets
- DEQ and Yellowstone National Park demonstrating B100
- MDT completed cold climate "demo" project–December 2004



What the Biodiesel Industry Needs

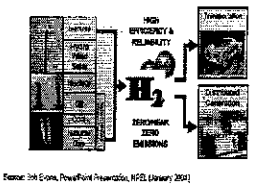
- Low cost vegetable oil
- Oil extraction and crushing
- Market for co-product
- Competitive transportation
- Financing

Opportunities Offered by Biodiesel

- Expand existing Agricultural economy
- Add new oil seed crop - camelina
- Economic development in rural areas
- Added value products – fish meal
- Lower transportation costs by buying locally
- A B20 blend reduces regulated vehicle emissions 10 to 21 percent

What is Hydrogen

- Hydrogen is the most plentiful element in the universe produced from natural gas, coal, gasoline, biomass and other sources
- Hydrogen is considered to be a very clean, high quality form of energy
- Hydrogen can be used in a fuel cell or as fuel for internal combustion engines



Fuel Cells

- Device that uses hydrogen or hydrogen rich fuels and oxygen to create electricity
- More energy efficient than combustion engines
- If pure hydrogen is used a fuel, fuel cells emit only heat and water, eliminating concern about air pollutants or green house gasses
- Can be used to generate heat and electricity for buildings, run turbines to produce electricity or power vehicles

Opportunities

- Hydrogen is produced from natural resources found in Montana (wind, coal, biomass, and solar)
- Montana is the only state with palladium and platinum production
- Hydrogen can be used to fuel generation systems to back up other renewable energy resources
- Hydrogen industry attracts quality technology jobs
- UM-COT established a hydrogen safety center, a K-12 curriculum, and plans for a hydrogen futures park
- MSU has research projects underway
- Possible federal funding for fuel cell research