Chesapeake Bay Next-Generation Biofuels Summit

Sponsored by
Chesapeake Bay Commission & Commonwealth of Pennsylvania

September 4, 2008
What is the “Bottom-line” for Biofuels and Water Quality?

**Handled right**, biofuels can be a source of substantial permanent new income for farmers and foresters, can help reduce greenhouse gases, and can reduce nutrient pollution to the Bay.

**Handled wrong**, biofuels can bring economic uncertainty, do little for greenhouse gasses, increase the cost of animal feed, and exacerbate nutrient pollution.
What are the Feedstocks of Biofuels?

- **Natural Oils**: animal fat, yellow grease, restaurant waste, algae, and oilseed crops like soy and palm oil.

- **Sugars/Starches**: corn, sorghum, sugar cane and beets, hulless barley.

- **Cellulosic Biomass**: perennial grasses, woody biomass, corn stover, wheat and rice straw.
Grain-Based Ethanol
Summary of Findings: Grain-Based Ethanol

**MAJOR POTENTIAL SOURCES:**
Mostly corn and some hulless barley.

CBC projects corn acres could increase up to **300K** in 3-5 years.

**POSITIVES:** Benefits include more viable farming, preservation of farmlands from development, and opportunity to expand cover crops and other conservation practices.

**NEGATIVES:** Increased nutrient loads due to increased fertilizer runoff, relatively poor nutrient uptake by corn, condition of new acres, and possible loss of CRP lands.
Impacts of Alternative Biofuels Scenarios
Watershed Delivered Load, Million lbs. N per year

- Corn: 5.0
- Soybeans: 2.6
- 300K Switchgrass: -8.3
- Corn w/ CC: -17.1
- 1M Switchgrass: -25.4
Cellulosic Ethanol
Summary of Findings: Cellulose-Based Ethanol

**MAJOR POTENTIAL SOURCES:** Corn stover, woody biomass, perennial grass

**ADVANTAGES:**
- greenhouse gas and nutrient retention,
- erosion control, energy savings.

Overall, a promising source of sustainable income for farms and forests beginning 2012 to 2015, can be managed to help reduce nutrient overloads to the Bay.

**DISADVANTAGE:** Technology not ready yet.
**Impacts of Alternative Biofuels Scenarios**

Watershed Delivered Load, Million lbs. N per year

What if you were to combine switchgrass with corn with BMPs?
Recommendations to Executive Council:

**HERE & NOW**
- Create long-term, sustainable funding programs for Ag BMP’s in every watershed state.
- Provide adequate delivery mechanisms through technical assistance and outreach.

**NEAR-TERM FUTURE**
- Position the Chesapeake region as a national leader in an emerging cellulosic biofuel industry.
- Identify dedicated funds to research and develop the needed technology.
- Hold Cellulosic Biofuels Summit.
Next-Generation Biofuels
Taking the Policy Lead for the Nation
Cellulosic Biofuels Advisory Panel

Baseline Assumptions
Biofuels Advisory Panel Baseline Assumptions

1. Sustainability

The proper focus for biofuels in the Chesapeake region is economic and environmental sustainability, defined as:

- reduction in nutrient and sediment loadings to the Bay and its rivers;
- net energy benefits;
- net lifecycle greenhouse gas reductions;
- neutrality or benefits re: food security and cost;
- net social and economic benefit to localities; and
- no net loss in biodiversity and natural resources.
2. Regional Factors Affecting Biofuel Production

- Competing markets
- Access to bio-refineries and petroleum blending;
- Feedstock suitability and availability;
- Low level of regional investment in corn ethanol;
- Poultry and other feed costs;
- Help for forest and farm economies; &
- Reductions in sediment and nutrient loadings and greenhouse gasses.
Choosing Our Future

The Chesapeake Region is the least invested in ethanol of any corn-growing region in the nation.
The future of corn-based ethanol in the region is uncertain;

Current U.S. energy policy calls for a doubling of corn-based ethanol production by 2015;

Regional corn acreage will likely max out at only 300,000 new acres, double the change from 2006-2007 while yields will rise; &

Any regional biofuel refineries will use feedstocks imported or from the Corn Belt.
Feedstock mix for the region is unclear but could include corn stover, other crop residues, cover crops, switchgrass and other perennial grasses, forest slash, wood residues, fast growing trees, municipal wastes or algae.

Key is to make choices that improve environmental conditions while remaining flexible to market and other forces.
5. Environmental Issues

- The emphasis on regional environmental improvement from biofuel development is on nutrient and sediment reductions to the rivers and the Chesapeake;

- Other issues include water supply and use, wildlife habitat, invasive plant species, greenhouse gas reductions and net energy benefits.
Comparing Fuels:

Estimated change in greenhouse gas emissions if petroleum fuel is replaced by one of these alternatives.
6. Land Use Changes

The potential scale of cellulosic ethanol and other next-generation biofuel development provide challenges and opportunities for:

- Mined area reclamation;
- Soil conservation and erosion control;
- Forest cover;
- Wildlife management;
- Use of pasture and underutilized lands; &
- Reduction of urban sprawl.
7. **Overall Approach**

- Be flexible;
- Plan on diverse feedstocks and fuels;
- Keep the scale relatively small and at the local level; and
- Take advantage of what farmers and foresters already do well in our region.
Next-Generation Biofuels
Taking the Policy Lead for the Nation

The Policy Recommendations
Three major subject areas where action is to be focused:

I. **Feedstocks**: Assuring a reliable and accessible supply of large amounts of biomass grown in the Chesapeake region.

II. **Natural Resource Protection**: Determining the types of biomass used, where they are grown, and the best management practices needed.

III. **Marketing and Infrastructure**: Harnessing the region’s opportunities for production capacity, distribution of feedstocks and biofuels, and marketing of biofuels and their co-products.
I. Feedstocks

- Coordinate regional input on U.S. Department of Agriculture conservation programs to promote sustainable feedstock production and harvest (Regional).

- Encourage local or on-farm use of biomass (Regional).

- Encourage winter biofuel crops as first-generation feedstocks (State).

- Ensure the nursery and seed industry has adequate supplies of feedstocks (State).
Maximizing the Potential of Biomass Production and Uptake of Nutrients.

SOURCE: Andrew H. Heggeness, Iowa State University
II. Natural Resource Protection

- Discourage use of invasive non-native feedstocks (Regional).
- Establish regional research priorities (Regional).
- Assure broad and effective use of best management practices (State).
II. Natural Resource Protection

- Establish or update state removal guidelines for crop residues and forest slash and provide incentives for their adoption *(State)*.

- Provide incentives for forest management plan development and implementation *(State)*.

- Encourage sustainable biofuels production on abandoned or underutilized land *(State)*.
III. Marketing And Infrastructure

- Coordinate regional action to secure funding from the 2008 Farm Bill, 2007 Energy Act, and 2005 Energy Act (Regional).
- Develop a regional carbon trading strategy (Regional).
- Coordinate as a region to affect national energy policy (Regional).
- Establish a regional analytical framework for biofuels development (Regional).
- Establish a regional strategy to encourage greater use of higher blends of biofuels (Regional).
III. Marketing And Infrastructure

- Implement a regional outreach effort (Regional).
- Proactively communicate consistent messages about the benefits of biofuels and the importance of their sustainable production (State).
- Establish biofuel market purchase requirements and incentives (State).
- Utilize state economic development programs (State).
- Focus facility support on small-scale, first-stage operations (State).
Conclusions

- A number of cooperative regional bodies need to be established.
- A number of Executive actions are needed.
- A number of items need to be dealt with by the state legislatures.
- Public education is important.
- There is no reason we cannot lead the Nation in the move to next-generation cellulosic biofuels.
A Project championed by
Chesapeake Bay Commission &
Commonwealth of Pennsylvania

For more information:
aswanson@chesbay.us
pbuckley@state.pa.us