

Bio products ...productive conversion



Replacing 10% of petroleum with bio fuels such as ethanol would reduce annual estimated tailpipe greenhouse gas emissions (for light-duty vehicles) by 5.1 million tons of CO₂ by 2010.

The term “bio material” refers to crops, crop waste, timber, animal waste, wood processing waste, and food processing waste.

Bio material can be used to produce a wide variety of bio products, including:

- adhesives
- alternative fuels / additives
- bioplastics / polymers / films
- construction materials / composites / plastic lumber
- inks
- landscaping materials
- lubricants and functional fluids
- paints / coatings
- solvents / cleaners
- absorbents
- tree-free paper / packaging / fibers

Bio products reduce greenhouse gases by serving as substitutes for fossil fuels and having the carbon in the bio mass converted into a durable product.

Read all details of the OEC's global warming study, Ohio Climate Road Map, Part 2 at www.theOEC.org

the OEC'S Top Ten

1. Carbon bio capture
2. Carbon geological capture
- 3. Bio products**
4. Methane emission reductions
5. Greenhouse gas markets
6. Electric & heating efficiency
7. Vehicle efficiency
8. Wind & solar power
9. Low or no-carbon energy systems
10. Cleaner diesel

Technology Options

Thermal Processes

Bio products can be converted into fuel through combustion, gasification or pyrolysis. Co-firing of coal and biomass in a conventional coal plant is a good example of biomass combustion. Gasification is the use of high temperatures to convert biomass into a synthetic gas (“syn gas”) made up of hydrogen and carbon monoxide which can then be combusted to generate electricity. An example of pyrolysis is the rapid decomposition of biomass by heat in the absence of oxygen which produces gases that can be combusted for heating use.

Metabolic Processes

Metabolic processes can turn bio material into fuels such as ethanol and biodiesel. A metabolic process using biochemical pathways can produce products such as ethanol through fermentation and biodiesel through esterification/transesterification.

In addition, some bio factories include genetically engineered bacteria as part of their biochemical process in producing polymers.



Recommendations for a better Ohio

Promoting Bio Product Demand

Establish a state purchasing program

The State should adopt a procurement and contractor policy that targets the purchase of biofuel “ready” vehicles.

Develop a state tax credit program

The State should develop a tax credit to promote the purchase of bio fuels in the private sector.

Create an advanced technology portfolio standard

Ohio should adopt an ATPS which requires electric power suppliers to obtain a portion of their power from renewable sources. Co-firing biomass in coal-fired power plants and co-gasifying biomass in coal gasification plants should be eligible.

Create a bio-feed stock task force

This task force should be made up of colleges, universities, state agencies, non-government organizations, and agribusiness stakeholders. The focus should be to identify the best environmental and greenhouse gas practices for bio feed stock use.

Adopt a renewable fuels standard

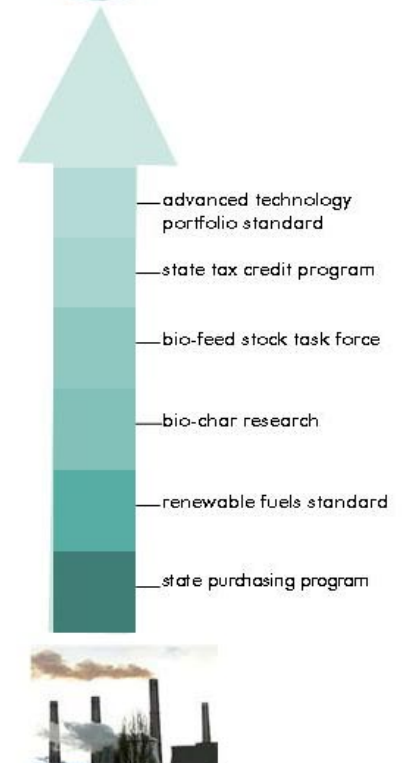
Ohio should develop a renewable fuels standard that requires a minimum content of renewable fuel in gasoline and diesel sold in Ohio.

Next Steps

1. Ohio researchers should coordinate with existing programs to develop a research agenda for bio char. The goal would aim to identify the greenhouse gas benefits and commercialize the technology in the next six-eight years.
2. State and federal funds should be allocated to further research bio char.
3. Stakeholders should work together to develop a set of incentives that address the initial process development obstacles for the bio products industry.
4. State lawmakers should adopt the 2005 rider for the Ohio Energy Loan Fund on a permanent basis to fund targeted grant programs to develop advanced technology energy sources.



The market cost of corn ethanol depends upon corn prices—at \$2.34 per bushel of corn, ethanol would be priced at an estimated \$1.40 per gallon.



Toward a cleaner earth