

# **THE FUTURE FOR BIOPRODUCTS**

**EVERYTHING OLD IS NEW  
AGAIN – AND THEN SOME**

**PRESENTED TO THE  
GLOBAL AGRICULTURAL  
FORUM 2007**

**June 14, 2007**

**Sheraton Centro Historico Hotel  
Mexico City**

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# BIOBASED INDUSTRIAL PRODUCTS ARE BACK

- Biobased industrial products were common in the first two decades of the last century
- The emerging petroleum industry and petrochemical industry provided more product innovation at lower cost
- Three factors have converged to shape the re-emergence of biobased industrial products

- Petroleum and natural gas based energy and products have become more expensive and supplies less dependable
- Growing concerns with global climate change have caused more attention to environmental sustainability and carbon cycle management
- Biological sciences are now much more adept at creating new products

# U.S. PUBLIC POLICY HAS PLAYED AN IMPORTANT ROLE

- Biomass Research and Development Act
  - Funding research, development, and demonstration projects
- Energy Title of 2002 Farm Bill
  - BioPreferred preferred procurement
  - Renewable energy and energy efficiency grants and loan guarantees
- Energy Policy Act of 2005
  - Renewable fuels requirement, 7.5 billion gallons
- Tax credits for ethanol (51 cents per gallon) and biodiesel (\$1.00 per gallon)

# PROPOSED U.S. PUBLIC SECTOR INVESTMENTS

- Bush Administration's farm bill proposals include \$1.6 billion in new funding for renewable energy research, development, and production.
- Including \$2.1 billion in guaranteed loans for cellulosic projects,
- \$500 million for bioenergy and bioproducts research, and
- \$500 million for renewable energy systems and energy efficiency grants
- Department of Energy will invest up to \$385 million over four years to support cellulosic ethanol development

# CURRENT U.S. BIOFUELS PRODUCTION

- Ethanol production capacity of 7 billion gallons in April, 2007, from 118 plants, many of them farmer owned
- Biodiesel production capacity of 864 million gallons in January, 2007, from 105 plants, many of them farmer owned
- Increased emphasis on developing biomass sources that do not compete with food or feed

# U.S. WIND ENERGY DEVELOPMENT

- 29% annual growth rate over 2000 to 2005
- 9,149 megawatts installed at end of 2005
- Industry expects to install 3,000 megawatts in 2007
- U.S. wind energy potential is estimated to be 10,777 billion kilowatt hours
- U.S. production tax credit of 1.9 cents per kwhr in place

# U.S. PHOTOVOLTAIC ENERGY

- 1996 peak kilowatts produced – 13,016
- 2005 peak kilowatts produced – 424,807
- Federal tax credit of 30% of expenditures for solar technologies (through 2008)
- Various state level incentives also apply
- Technological breakthroughs in efficiency of solar energy development are creating new interest in solar energy

# U.S. POLICY SUPPORTS BIOREFINERY DEVELOPMENT

- Bioproducts, and feedstocks for bioproducts, are part of the same refining process for biofuels, increasing cost effectiveness of both
- An extensive array of chemical building blocks and final chemicals can be produced from biobased feedstocks
- Biobased chemicals can often be produced more cheaply and more quickly with greater environmental sustainability than can chemicals from petroleum or natural gas

# TOP VALUE ADDED CHEMICALS FROM BIOMASS

- U.S. Department of Energy has identified twelve biobased chemicals as building blocks for a wide range of final products
- End use products include familiar products such as: composite panels, hydraulic fluids, solvents, coatings, clothing plastic films and containers, adhesives, wood substitutes, cleaning agents, carpeting, personal care products, and pharmaceuticals

# GLOBAL CHEMICAL INDUSTRY GROWTH

- Industry grows by 3 – 6% per year
  - Biobased share projected to rise from 2% now to 22% of industry by 2025
- Global chemistry industry will grow to over \$2 trillion by 2025
  - Biobased share to exceed \$500 million per year
- Corn will be primary feedstock for next 10 years with cellulosic sources becoming dominant within 20 years

# PROJECTED GLOBAL MARKETS OF BIOBASED CHEMICALS

- Commodity chemicals:
  - 2005 -- \$0.9 billion; by 2025 -- \$50-86 billion
- Specialty chemicals:
  - 2005 -- \$5 billion; by 2025 -- \$300-340 billion
- Fine chemicals:
  - 2005 -- \$15 billion; by 2025 -- \$88–98 billion
- Polymers:
  - 2005 -- \$0.3 billion; by 2025 -- \$45-90 billion

# A BIOBASED PROCUREMENT PREFERENCE PROGRAM

- Focus of presentation will now shift to a preferred procurement program for biobased products affecting all Federal agencies and their contractors
- Two states have enacted legislation modeled after the Federal program
- A number of countries are also reviewing the U.S. program as a guide

# FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM

- Provides that Federal agencies must give purchasing preference to biobased products designated by this program
- Authority for the program included in the Farm Security and Rural Investment Act (FSRIA) of 2002
- Section 9002 provides for both preferred procurement and labeling programs

# SECTION 9002 OF FSRIA SETS OUT FEDERAL AGENCY REQUIREMENTS

- The Act defines biobased products as commercial or industrial products that are composed, in whole or in significant part, of biological products or renewable **domestic** agricultural materials (including plant, animal, and marine materials) or forestry materials

# DOMESTIC CONTENT

- Is interpreted to mean content from any country with which the United States has a preferential trade agreement
- Countries that are signatories to NAFTA and CAFTA, for example, will have their qualifying biobased products treated the same as U.S. domestic products
- Label program requires minor statute change in biobased definition

# WHY DID CONGRESS CREATE THIS PROGRAM?

- To spur demand growth for new biobased products/jump start a new industry
- To grow domestic demand for agricultural commodities
- To encourage development of processing and manufacturing in rural communities
- To capture environmental benefits
- To enhance the Nation's energy security

# WHAT DOES THE PROGRAM REQUIRE?

- All Federal agencies must give preference to biobased products that have been designated by the program, unless:
  - The products are not reasonably available
  - The products fail to meet performance standards for the application intended
  - The products are available only at an unreasonable price

# DESIGNATING ITEMS FOR PREFERRED PROCUREMENT

- Items are generic groupings of products
- Items are designated by rule making
- Once designated, all 'qualifying' products within a designated item are eligible for preferred procurement
- Federal agencies have up to one year to implement procurement preference

# WHAT IS A 'QUALIFYING' BIOBASED PRODUCT?

- It is consistent with definition in statute
- Biobased content is known
- Environmental and health effects of product use are available
- Product performance, as tested against industry recognized standards, is known
- Designation is based on providing reliable and relevant information to Federal agency

# EXCLUSIONS FROM THE PROGRAM

- The following product groups are excluded from the program by statute:
  - Food and feed
  - Motor vehicle fuels
  - Electricity

# AGENCIES' SPECIFICATIONS MUST COMPLY

- Within one year after final guidelines issued, (January 11, 2005) agency specifications require use of biobased products
- Agencies must create procurement program
  - A biobased products preference program
  - An agency promotion program
  - An annual review and monitoring of effectiveness of agency's program
- Within one year after designation, agencies' must give procurement preference to items
- Applies to Federal agency contractors, as well

# TO USE THE PROGRAM A MANUFACTURER CAN:

- Claim coverage under the program for all products for which items (generic groupings of products) have been designated by rule making
- Certify that a product's biobased content is consistent with statutory definition
- Certify biobased content meets minimum requirement, using ASTM standard test
- Certify that a product will perform in the use to which it will be put

# BIODEGRADABILITY REQUIRED

- To be designated for preferred procurement, items of single use bioplastic products must meet appropriate ASTM standard for biodegradability
- Some examples are:
  - Cutlery
  - Garbage bags
  - Food containers

# FEDERAL AGENCIES MAY ASK FOR PRODUCT INFORMATION

- Federal agencies may ask the manufacturer for the following information:
  - Biobased content information using ASTM test
  - Environmental and health effects of product use using BEES analysis or ASTM standard
  - Product's life cycle cost using same standards
  - Results of product performance testing against industry recognized performance standards

# ITEMS IN PROCESS OF BEING DESIGNATED

- Hand cleaners and sanitizers
- Adhesives and mastic removers
- Sorbents
- Graffiti and grease removers
- Glass cleaners
- Dust suppressants
- Carpet and upholstery cleaners
- Bathroom and spa cleaners
- Floor strippers
- Laundry products

# EXAMPLES OF ITEMS PROPOSED FOR DESIGNATION

- Metal working fluids
- Composite panels
- Biodegradable containers
- Hydraulic fluid for stationary use
- Hydraulic fluid for mobile uses
- Durable plastic films
- Biobased carpet
- Biodegradable cutlery
- Greases
- De-icers
- Clothing products

# BIOBASED PRODUCTS MARKET PLACE

- **170** Items (generic groupings of products) identified so far
- **2,119** companies identified that produce or market **11,758** biobased products
- For the first four rounds of designation, **36** items are designated that include **2,438** individual biobased products

# DESIGNATING PRODUCT ITEMS

- Must be done by rule making process
  - Proposed rule
  - Public comment period
  - Final rule
- USDA must consider information on
  - Product availability
  - Economic and technological feasibility of use, including life cycle costs

# DESIGNATING PRODUCT ITEMS

- USDA must also provide information to Federal agencies concerning:
  - Relative price
  - Performance
  - Environmental and public health benefits
  - And, where appropriate, recommend a level of biobased content in the procured product

# VOLUNTARY LABELING PROGRAM

- Qualifying biobased products may gain use of **U.S.D.A. CERTIFIED BIOBASED PRODUCT** label and logo
- Authority to use label granted for limited number of years with re-authorization
- Proposed rule to establish labeling program in formal clearance in USDA
- We anticipate opening the labeling program to biobased products from mature markets, as well as from new and emerging markets
- Label available to all qualifying biobased products

# USDA'S MODEL PROCUREMENT PROGRAM

- Under leadership of Departmental Administration
- In coordination with the Office of Federal Procurement Policy of OMB
- This program will be available to all Federal agencies
- Its purpose is to train agencies, educate, and promote use of biobased products

# CONCLUSIONS

- There is private and public sector interest in developing the biobased economy
- This effort is underwritten by a supportive public policy foundation
- Biofuels and bioproducts are expected to fill growing roles in the U.S. economy
- The BioPreferred Program is an innovative effort to spur bioproduct market development