US Biofuel Policy Instruments

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Berlin, Germany: December 2007
EESI: Advancing Innovative Solutions!

• Dedicated to promoting sustainable societies through innovative policies on energy, climate, transportation, agriculture, and smart growth
• Founded in 1984, by a bipartisan Congressional Caucus
• Provides timely information regarding science, policy, and technologies
• Organizes ~20 Congressional briefings a year
• Builds coalitions and networks
• Publishes 3 electronic newsletters
  – BCO – Bioenergy, Climate Protection & Oil Reduction
  – Climate Change News
  – National Clean Bus update
• EESI Associates Program allows companies and individuals to participate
Overview

• Biofuel policy development in the US
  – Different policy fields and instruments
• Current US federal biofuel policy
• Biofuel policy in the works
  – Major areas of conflict among the different policies
• Biofuels: One part of a larger strategy
Biomass Incentives Project

• Identifying effective state incentive mechanisms to foster biofuels, biopower, and bio-based products development
• Evaluating opportunities to adapt or package state incentives to complement federal and local incentives
• Three-year USDA-sponsored project
• Project team members:
  – North Carolina Solar Center – NC State University
  – Environmental and Energy Study Institute
  – New Uses Council
## Contributing Organizations

- American Coalition for Ethanol
- American Corn Growers Association
- American Farmland Trust
- American Soybean Association
- BioCycle
- Biogas Energy Systems
- Biomass Investment Group, Inc
- Cargill
- Center for Rural Affairs
- Climate Solutions
- Coalition of Northeastern Governors
- Council of Great Lakes Governors
- Dairyland Power
- DuPont
- Earthshell Corporation
- Federation of Southern Cooperatives
- GEMTEK Products
- Governors Ethanol Coalition: Nebraska
- Great Plains Institute
- Institute for Agriculture and Trade Policy
- IOGEN
- Michigan State University
- Mid-Atlantic Biofuels
- Minnesota Lung Association
- Minnesota Project
- National Association of Conservation Districts
- National Association of State Energy Officials
- National Biodiesel Board
- National Center for Appropriate Technology
- National Corn Growers Association
- National Farmers Union
- National Rural Electric Cooperative Association
- New England Wood Pellet, Inc
- New York State Energy Research and Development Authority (NYSERDA)
- North Dakota State Energy Office
- Oak Ridge National Lab
- Pennsylvania Department of Agriculture
- Piedmont Biofuels
- Renewable Fuels Association
- Renewable Lubricants
- State of Florida
- State of Kansas
- State of Minnesota
- State of New Mexico
- SUNY: State University of New York
- University of Idaho
- University of Tennessee
- US Department of Agriculture
- US Department Of Energy
- US Environmental Protection Agency
- Yale University
Identification and Data Collection of Externalities associated with Biomass Technologies

- Creation of jobs
- Wildlife habitat enhancements
- Wildfire risk reduction
- Public health benefits
- Promotion of “Green Buildings”
- Improved national security
- Increased energy independence
- Promotion of advancements in science and technology
- Prevention of urban sprawl and property development oversensitive lands
- Improvements in animal waste handling technologies.

- Water quality improvement
- Reduction of trade deficit
- Improvement of air quality
- Reduction of carbon dioxide emissions
- Reduction of methane emissions
- Retention of small family farms
- Protection of biodiversity
- Reduction of fuel costs and price volatility
- Waste reduction
- Soil improvements
## Biomass Incentives

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- Sales, excise, property, corporate & user
Complementary Incentives
(examples)

**Economic**
- Enterprise Zones
- Entrepreneurship Centers
- Small Business
- Kansas Bioscience Authority Act

**Health**
- National Pollution Elimination Discharge System

**Air Quality**
- Congestion Mitigation and Air Quality (CMAQ) Improvement Program

**Natural Resources**
- Environmental Quality Incentives Program
Broad Policy Objectives

• Climate Change
• Environmental Stewardship
• National Energy and Security
• Public Health
• International Competitiveness
• Economic Development through local ownership
• Diversify and Sustainability Grow the Domestic Agriculture Portfolio while Decreasing Dependence on Export Markets
Existing US Biofuel Policy

- 1990 Clean Air Act Amendments
- 2002 Farm Bill: Energy Title
- American Jobs Creation Act of 2004
- Energy Policy Act of 2005
- America COMPETES Act of 2007
1990 Clean Air Act Amendments

• The Act requires that cleaner-burning reformulated gasoline (RFG) be sold in the nine areas with the worst ozone pollution. The requirement became effective on January 1, 1995.

• Ethanol as well as MTBE could be used to meet the reformulated gasoline requirement.
2002 Farm Bill (P.L. 107-171): Energy Title

- Sec. 9002 Procurement of Biobased Products ($1 mil/yr)
- Sec. 9003 Biorefinery Development Grants
- Sec. 9004 Biodiesel Fuel Education Program ($1 mil/yr)
- Sec. 9005 Energy Audit and Renewable Energy Development Program
- Sec. 9006 RE/EE Improvements ($23 mil/yr)
- Sec. 9007 Hydrogen and Fuel Cell Technologies
- Sec. 9008 Biomass R&D Act of 2000 ($63 mil/yr)
- Sec. 9009 Carbon Sequestration Research
- Sec. 9010 CCC Bioenergy Program ($150 mil/yr)
Renewable Energy Systems & Energy Efficiency Improvements Program

• Purchase of renewable energy systems and energy efficiency improvements for agriculture producers and rural small businesses

• During the first 4 years USDA spent $87 mil in grants and $24 mil in loan guarantees for more than 800 projects
  – 170 mil/yr of ethanol and biodiesel
  – 330+ megawatts of wind power
  – 1.3 million tons of CO2 Reductions

• FY07 Awards
  – 345 recipients of renewable energy and energy efficiency
  – Of the total $18.2 million, $4.8 million has been awarded for guaranteed loans and $13.4 million for grants.
  – Recipients represent 37 different states
American Jobs Creation Act of 2004

- Primarily passed to end the trade dispute with the EU over export programs ruled illegal by the WTO
- Extended the Volumetric Ethanol Excise Tax Credit (VEETC) until 2010
  - Eliminated any impact of the ethanol program on the Highway Trust Fund
- Modified the Small Ethanol Producer Tax Credit, which allows cooperatives to fully participate in the program.
- Created Tax Credit for biodiesel

Some Wins

• Renewable Fuel Standard
• Amends Biomass Research & Development Act of 2000
• Elimination of the Federal (reformulated gasoline) RFG Oxygenate Standard (effectively increasing demand for ethanol as MTBE was phased out voluntarily by petroleum companies)
• Integrated Biorefinery Demonstration Projects
• Biofuel Tax Credits
• Loan Guarantee Program
Biomass Research & Development Act

• Executive Order 13134: DEVELOPING AND PROMOTING BIOBASED PRODUCTS AND BIOENERGY, issued in August of 1999

• Multi-agency effort to coordinate and accelerate all Federal biobased products and bioenergy research and development

• USDA/DOE Joint Solicitation since FY03

• Vision: For Bioenergy and Biobased Products in the United States, 2006
Renewable Fuels Standard (Sec. 1501)

- 7.5 billion gallons of renewable fuels to be sold or dispensed in 2012
- One gallon of cellulosic ethanol or waste-derived ethanol will be counted as 2.5 gallons
- After 2012, the 2.5-to-one ratio no longer applies, but the RFS will require annual minimum of 250 million gallons of cellulosic biomass fuels
Biorefineries

- Integrated Biorefinery Demonstration Projects (Sec. 932(d), EPAct ’05) - capital to build biorefineries
- February 2007, DOE announced $385 million for 6 cellulosic ethanol biorefineries
  - More than 130 million gallons of cellulosic ethanol annually
  - Biobased products, including: power, methanol, hydrogen, and ammonia.
  - Each biorefinery will use more than 700 tons of feedstocks per day including: agriculture residues such as corn stover, wheat and rice straw; wood residues, wood based energy crops; and landfill organic wastes
- May 2007, DOE announced it will provide up to $200 million, from FY07 to FY11, to support the development of small-scale, (at ten percent of commercial scale), cellulosic biorefineries in the United States
Tax Credits*

Volumetric Ethanol Excise Tax Credit (VEETC)
• This Blender's Credit is the 51 cents per gallon tax credit that goes to the petroleum industry as an incentive to blend ethanol into their gasoline

Agri-Biodiesel Excise Tax Credit
• $1.00 per gallon for biodiesel made from virgin oils derived from agricultural commodities and animal fats.

Biodiesel Excise Tax Credit
• 50¢ per gallon for biodiesel made from agricultural products and animal fats

Renewable Diesel Excise Tax Credit
• $1.00 per gallon for Renewable diesel derived from biomass using a thermal depolymerization process
Tax Credits (cont.)*

Small Ethanol and Agri-Biodiesel Producer Tax Credits
• Production income tax credit of 10 cents per gallon on up to 15 million gallons of ethanol per year
• For facilities that produce up to 60 million gallons annually

Secondary Offset Tariff
• To offset the 51 cent per gallon Blender's Credit a 54 cent per gallon tariff is in place.
• This helps to ensure that taxpayer dollars are not invested in foreign ethanol production.

Fueling Stations for Alternatives
• Gives gas station owners a tax credit of 30%, up to $30,000, of the cost of installing an E85 pump or converting an existing pump for E85

*Not all of these tax credits were in EPAct 05
Loan Guarantees

Loan Guarantees (Title XVII & XV, EPAct ’05)

– Risk mitigation for new technology
  • avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases
– $9 billion in loan authority being considered for FY08
– In Oct. DOE announced the Final Rule for the program
– 16 projects invited to submit pre-applications
  • 6 of the 16 projects are for biomass
– Competition for funds: Senators Bingaman (D-NM) and Domenici (R-NM) interested in coal-to-liquids and nuclear power
America COMPETES Act of 2007

• Helps America regain its technical edge and leadership in the physical sciences
  – $43.3 billion in federal spending in FY 2008-2010

• Protecting America’s Competitive Edge Through Energy Act (PACE-Energy Act), Title V
  – Creates a Science, Engineering, and Mathematics Education Fund
  – Establishes a summer internship program for students to provide experiential-based learning opportunities at the National Energy Laboratories

• Establishes the Advanced Research Projects Agency-Energy (ARPA-E) to overcome long-term and high-risk technological barriers in the development of energy technologies
US Biofuel Policy in the Works

• Farm Bills
  – Farm, Nutrition, and Bioenergy Act of 2007 (House)
  – Food and Energy Security Act of 2007 (Senate)

• Energy Bills
  – Creating Long-Term Energy Alternatives for the Nation Act of 2007 ' or the `CLEAN Energy Act of 2007‘

• Climate Bills
  – America's Climate Security Act of 2007
Farm Bill

- Increased Human Capacity Infrastructure
  - Public-private partnerships, Management assistance, Strategic business and financial planning, Continuing education, Spur innovation
- Biorefineries: Grants and Loans
  - Need to get plants up and running to demonstrate technologies
- Risk mitigation program for farmers and foresters to transition to new energy crops
  - Appropriate feedstocks for all different regions of the country
  - Increased yields with low inputs
  - Sustainable harvesting and storage techniques
**House Energy Title Programs**

- Federal procurement of biobased products.
- Loan guarantees for biorefineries and biofuel production plants.
- Energy audit and renewable energy development program.
- Renewable energy systems and energy efficiency improvements.
- Adjustments to the bioenergy program.
- Research, extension, and educational programs on biobased energy (Sun Grants).
- Energy Council of the Department of Agriculture.
- Farm energy production pilot program.
- Rural energy self-sufficiency initiative.
- Agricultural biofuels from biomass internship pilot program.
- Feedstock flexibility program for bioenergy producers (sugar).
- Biomass inventory report.
- Future farmsteads program.
- Sense of Congress on renewable energy.
- Biodiesel Education Program.
- Biomass Energy Reserve.
- Forest Biomass for Energy.
- Supplementing Corn as an Ethanol Feedstock (sorghum provision).
- Community Wood Energy Program.
## Senate Energy Title Programs
(before Senate floor action)

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Energy Bills

• Biofuels
  – Modifications to the Renewable Fuel Standard
  – Biorefinery Grants and Loan Guarantees
  – Research
  – Tax Credits

• Infrastructure Development
  – Vehicles
  – Fueling Pumps
  – Research
### Original House Energy Bill Included 11 Committees Legislation

- Energy and Commerce Committee, package of six bills
- Agriculture Committee
- Appropriations Committee
- Foreign Affairs, The International Climate Cooperation Re-engagement Act
- Education and Labor Committee, Green Jobs Act (H.R. 2847)
- Oversight and Government Reform Committee, Carbon-Neutral Government Act (H.R. 2635)
- Science and Technology Committee (seven bills)
- Transportation and Infrastructure Committee, Transportation Energy Security and Climate Change Mitigation Act of 2007 (H.R. 2701)
Renewable Fuel Standard

Senate Energy Bill (H.R. 6)

• Expanded (RFS) requires 8.5 billion gallons of renewable fuels in 2008 and increases to 36 billion gallon by 2022
• Biofuels will be required to emit 20 percent fewer lifecycle carbon emissions compared to gasoline
• Bill includes protections to ensure that increased use of biofuels will not harm air or water quality

• Beginning in 2016, an increasing portion of renewable fuels must be advanced biofuels, which is anything derived from non-corn starch feedstocks
• The required amount of advanced biofuels begins at 3 billion gallons in 2016 and increases to 21 billion gallons in 2022
S. 2191 America’s Climate Security Act

• Senate and Environment and Public Works Committee reported S. 2191 on Dec. 6, 2007 by a vote of 11–8. 15 of 50 amendments were adopted.

• S. 2191 is a cap-and-trade bill that places a declining cap on US emissions of six primary greenhouse gases (GHG) in the electric power, transportation and industry sectors.

• Limits the amount of (GHG) emissions to 70 percent of 2005 levels by 2050.

• Flexibility mechanisms:
  – banking (no time limit)
  – 15% borrowing (@ 10% interest)
  – 15% domestic offsets
  – 15% international emission allowances
S. 2191 America’s Climate Security Act (cont.)

• Establishes a Carbon Market Efficiency Board
  – Monitors the emissions trading market and periodically report to the President and Congress
  – Board may temporarily increase the amount that covered entities may borrow, lengthen the payback period of loans, and/or lower the interest rate on loans; and to loosen a given year’s economy-wide emissions cap by as much as 5%.

• Alexander Amendment #3. Reauthorizes existing program at EPA/Dept. of Energy to study availability of biofuels to replace existing transportation fuels. Approved by voice vote.

• Alexander Amendment #42. Adds low carbon fuel standard (LCFS) to upstream cap to help reduce reliance on foreign oil. Approved by roll call of 13-6.
California Low-Carbon Fuel Standard (LCFS)

• In the January 2007 California Governor Schwarzenegger established a Low-Carbon Fuel Standard (LCFS) by Executive Order.

• The goal is to reduce the "life-cycle carbon intensity" of California’s transportation fuels by at least 10 percent by 2020.

• This first-in-the-world greenhouse gas (GHG) standard for transportation fuels will spark research in alternatives to oil and reduce GHG emissions.
Low Carbon Fuel Standards

1. January 16: Senators Sanders (I-VT) and Boxer (D-CA) introduced legislation incorporating a Low Carbon Fuel Standard (S.309).

2. January 31: the European Commission proposed a European LCFS.

3. February 21: Senator McCain (R-AZ) endorsed a national LCFS.

4. March 30: Senators Collins (R-ME), Feinstein (D-CA) and Snowe (R-ME) introduced legislation to enact a National Low Carbon Fuel Standard (S. 1073).


7. May 8: Senators Obama (D-IL) and Harkin (D-IA) introduced legislation to enact a National Low Carbon Fuel Standard (S. 1324).
Biofuels **ONE** part of the Clean Energy and Climate Solution

- **There is No Silver Bullet**
- **New Policies**
- **New Technologies**
- **New Feedstocks** (including wastes)

- **Conservation & Efficiency Efforts**
- **Decreased Petroleum for Transportation Needs**
  - Flex-Fuel Vehicles/Plug-In Hybrids
  - Biobased products and renewable energy can reduce fossil energy use/ greenhouse emissions
Connecting Transportation & Electricity

National Plug-In Partner Campaign

• Most car trips are less than 20 miles – so with a Plug-In, the entire trip could be fueled by the electric battery.
• Owners can recharge their car at night when over 40% of the generating capacity in the U.S. sits idle.
• If the trip is longer than the battery range (about 40 miles), the car can switch to gasoline or a biofuel.

• At prevailing electric rates, the cost of an “electric” gallon is 70-80¢ – compared to gas, which is averaging $2.50 a gallon
• More than 125 public power utilities, largely signed on through the American Public Power Association
• Surpassed 6,000 soft fleet orders
• Includes 30 of the 50 largest cities in the US
• Provisions in House/Senate Energy Bills
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