

New York Bioenergy

Janet Joseph

Vice President

New York State Energy Research and Development Authority
(NYSERDA)

Bioenergy Market Development
February 17, 2010



Presentation Outline

- Why is Bioenergy important for NYS?
- Policy and market context
- NYS bioenergy initiatives and programs

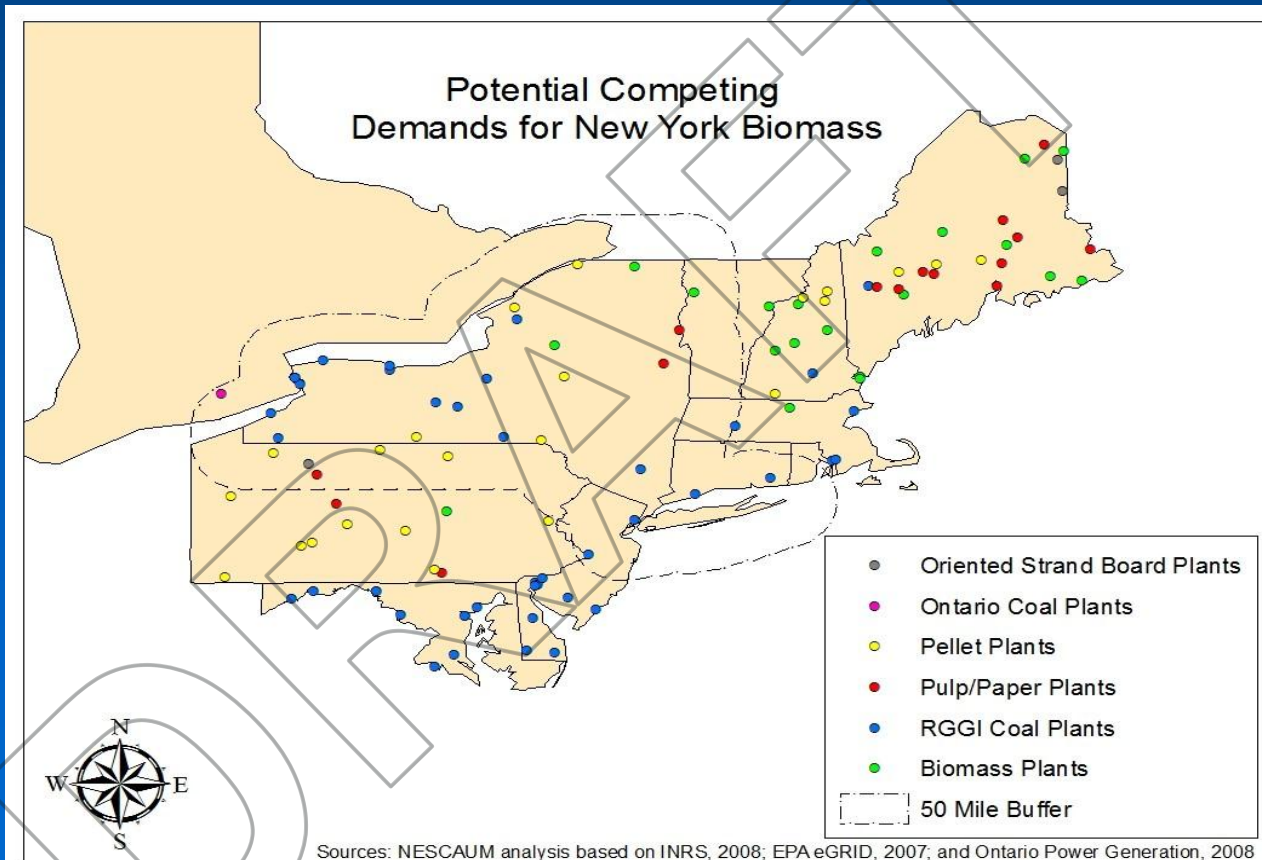
Bioenergy Benefits

- Petroleum displacement
- Local economic development
- Low-carbon option – if done sustainably!

Market Context: Bioenergy is Complicated

- Forms of biomass – lots of different feedstocks
- Conversion technologies – risk, innovation
- Products, end users, market sectors
- Infrastructure barriers
- Resource ownership management challenges
- Conflicting, uncertain or lacking policies

Market Context: Competing Uses for Biomass



- Biofuels
- Wood products
- Electricity generation
- CHP
- Thermal heating

RGGI could create substantial biomass demand

At 2.5% co-firing 4.3 green tons needed (current state-wide wood products industry)

Policy Context: Executive Orders

- State EO No. 111: Requires state agencies to purchase light-duty AFV's
- EO No. 142: Requires that biodiesel comprise 10% of transportation fuel and 5% of heating oil by 2012



Policy Context: Biofuels Tax Policy

- Elimination of state taxes on sale of E85 or B20
 - Worth about \$.38 per g for E85 and \$.08 per g for biodiesel

- Credit up to 50% for E85 refueling property (no cap)
 - Federal credit is 50% (capped at \$50,000)

- Bioheat: \$.01 per % of biodiesel up to \$.20 per gallon



Policy Context: In-State Biofuels Production Tax Credit

- Renewable Fuel Production Credit
 - NY companies can receive credit for each gallon produced
 - \$0.15 per gallon after first 40,000 gallons (\$2.5 M annual cap)
- Current Biofuels production:
 - Western New York Energy making 55 mgpy corn ethanol (Shelby, NY)
 - Northern Biodiesel operating, others in planning
 - Northeast Biofuels was to make 100 mgpy ethanol at former Miller Brewing Co. – plant sold to Sunoco, they plan to retrofit

Emerging State Bioenergy Policies

- Highlights of recent State Energy Plan:
 - Biofuels -- LCA completed 2011-2013, tax incentives aligned with LCA conclusions regarding alternative fuels
 - Bioheat – B20 in home-heating-oil tax credit extends beyond 2011
 - Biomass Heating
 - find \$ for wood boiler change out: 2009
 - biomass heating performance standards: 2011-2013,
 - Energy Star incorporated into incentive packages 2011-2013
- Low Carbon Fuel Standard – implemented 2014-2018
- Climate Action Plan – bioenergy use and sustainability is being considered

Bioenergy Programs/Efforts at NYSERDA

- Renewable Fuels Roadmap
- Biofuels (cellulosic ethanol, biodiesel, advanced)
- Biofuels Infrastructure (terminals, fueling stations)
- Biopower (RPS)
- CHP
- Biomass Heating (liquid biofuels)
- Biomass Heating (solid biomass)
- Anaerobic Digesters



Renewable Fuels Roadmap and Sustainable Biomass Feedstock Study

Supported by: NYSERDA, NYS Department of Environmental Conservation, NYS Department of Agriculture & Markets

Prime Contractor: Pace University

Report targeted on web in March 2010 with two annual updates.

- Life-cycle environmental consequences including upstream emissions and land-use impacts
- Best practices for supplying sustainable feedstock
- Current industrial and research base in NYS
- Distribution network
- Workforce and training needs
- Financial resources needed to develop industry
- Economic development benefits for agricultural areas

Preliminary “Roadmap” Conclusions

- Focus on Liquid Biofuels,
 - Many results useful to others in Bioenergy
 - Biofuels industry under distress
 - Few other choices for liquid transportation fuels
- Stakeholder input – held statewide meetings, sustainability survey shows low consensus among 35 criteria
- Sustainability must include how to measure, validate, enforce
- NY has enough feedstock for future biofuels industry
 - Forests growing 3x faster than we are cutting
 - 54% of NYS is forestland
- Life-cycle analysis shows GHG reductions
- 80% of jobs in feedstock (inc. transport)
- Need policies to: develop industry, increase demand, and help producers, harvesters, distributors, refiners

Biofuels Infrastructure



- NYS Biofuel Distributor Program
- Seven projects to store, blend and distribute biofuels
 - displace 3.4 m gallons of petroleum annually
- 2010 solicitation to be issued for cost-shared infrastructure projects – focus on E85

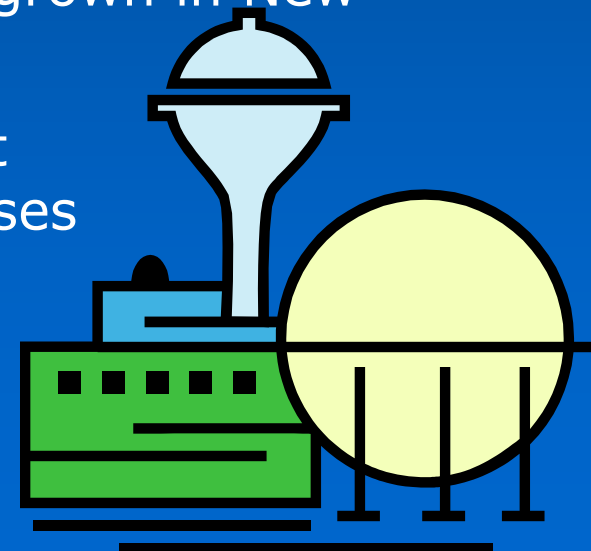
Biofuels Infrastructure

- NYSERDA Biofuels Station Initiative
 - \$10 M for incentives to 300 retail gas stations
 - 50% up to \$50,000 for equipment/installations
 - new dispensers and retrofits eligible
 - 14 Biodiesel stations
 - 45 E85 stations to date
 - Over 120 station applications
- Thruway Authority to introduce biofuels at travel plazas



Pilot Demonstrations: Cellulosic Ethanol Biorefineries

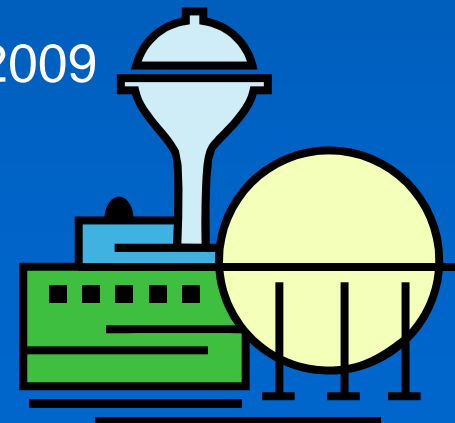
- Competitive Solicitation (issued in 2006) in partnership with NYS Department of Agriculture & Markets
- Share the risk of building and operating a pilot plant facility in New York State for three years
- Development of cellulosic ethanol feedstocks grown in New York
- Commercialization of technology developed at New York colleges, universities, and/or businesses based in New York State



Cellulosic Ethanol:



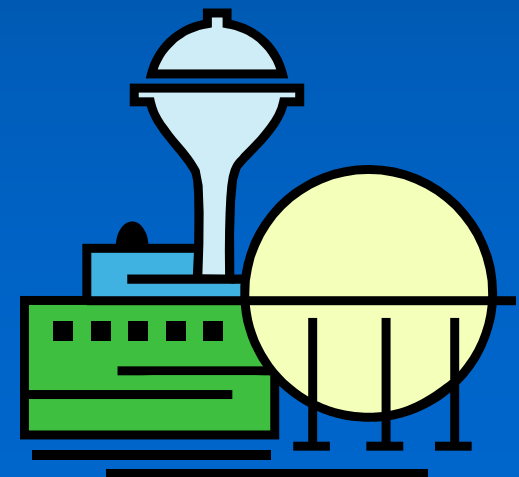
- Griffiss Technology Park in Rome, NY
- 500,000 gallons/year of ethanol capacity
- NYSERDA Funds: \$14.8 million Total Cost: \$29.8 million
- Partners: Cornell, Clarkson, Dartmouth
- Feedstocks: wood chips, willows, papermill sludge, switch grass
- Lignin, other co-products
- Bench unit completed June 2008; Pilot completed Jan. 2009
- Operate for 3 years – rotate feedstocks



Cellulosic Ethanol:



- Co-located pilot plant with power plant.
- NYSERDA Funds: \$10.3 million Total Cost: \$20.7 million
- Biomass extraction (hemicellulose), membrane separation and fermentation developed and tested at SUNY-ESF
- Partners: SUNY-ESF, O'Brien & Gere
- Feedstocks: willows, harvested wood
- Lab work nearly complete. Pilot to follow



Residential and Commercial Heating (liquid biofuels)

- Laboratory testing of biodiesel and Ultra Low Sulfur Heating blends, cellulosic bioblends
- Development of commercial biodiesel burners, biodiesel condensing boiler
- Demonstration of biodiesel blends with residual fuel oil

Residential and Commercial Heating (solid biomass)

- Market survey of high efficiency European biomass combustion appliances
- Energy and emissions performance of high efficiency pellet boiler integrated with solar thermal and hot water storage
- Comparative study of emissions and energy performance of residential biomass heating systems
- Multiple demonstrations and evaluations of high efficiency, low emissions wood heating equipment

Residential and Commercial Heating (solid biomass) cont'd

- Development of multiple high efficiency, low emissions wood boilers
 - 3 NYS manufacturers supported by NYSERDA
- Laboratory testing of grass combustion appliances
- Development of a mobile grass pelletizer
- Evaluation of wood feedstock variability
- Working with regulators to set performance standards

Biopower in the RPS

Main Tier

Facilities: Niagara Generating Facility, AES Greenidge

New Renewable Capacity of 30 MW

Expected to Produce 209,000 MWh/yr

Projected Economic Benefits: \$10,710,263

Maintenance Resource

Facilities: Boralex Chateaugay Biomass Plant, Lyonsdale Biomass

Expected to Produce 259,283 MWh/yr

Projected Economic Benefits: \$23,130,597

Biomass-Fired CHP Units

- Lockheed Martin, Owego
 - (2) 600 HP biomass boilers
 - using waste products from local lumber mills
 - Will save \$2.1 million in operating expenses annually
- US Salt, Watkins Glen
 - Fluidized-bed boiler
 - Will save \$4 million annually
 - 5-6 year payback
- Griffiss Business Park, Rome
 - Feasibility study addressed feedstock cost and supply in 50-mile radius
- Guidebook on siting bioenergy CHP

Anaerobic Digesters

- Dairies, wastewater treatment plants, food processors
- New York -- third largest dairy cow population
- ADG is a proven technology that can:
 - Reduce odor issues
 - Reduce greenhouse gas emissions
 - Improve farm nutrient management
 - Reduce long-term operating costs
- As of December 2009, NYSERDA has contracted for 5 MW of renewable electricity capacity with
 - 15 farms
 - 3 wastewater treatment plants



Summary

- **Bioenergy is a complicated business!!**
- **Highly affected by policy**
- **Tremendous biomass resources in NYS**
- **Sustainable production of biomass resources will be key (included in new RGGI programs)**

Where to find information:

- <http://www.nyserda.org/publications/>
 - Biomass Guidebook
 - Biodiesel Feasibility Study
 - Renewable Fuels Roadmap
(coming in March)
- www.NYSEnergyPlan.com
- NYSERDA staff contacts:
 - Jeff Peterson (imp@nyserda.org)
 - Judy Jarnefeld (jj1@nyserda.org)

