

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	18%		34%	
124	Urban Forestry	10%		12%	
401	Structures, Facilities, and General Purpose Farm Supplies	14%		0%	
402	Engineering Systems and Equipment	8%		9%	
403	Waste Disposal, Recycling, and Reuse	25%		21%	
404	Instrumentation and Control Systems	5%		8%	
605	Natural Resource and Environmental Economics	20%		16%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	173.0	0.0	3.0	0.0

2. Institution Name: Cornell University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
851972	0	198999	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
851972	0	198999	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: NY State Agricultural Experiment Station

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	27295	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	27295	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This is a program entailing a wide range of applied research activities and multiple education methods depending on local context and need. Campus-based faculty and extension associates, regional specialists and county-based educators all are involved in designing, implementing, and evaluating tailored applied research and educational efforts depending on the focus and scope of their role. In spring 2010 we launched a major statewide educational initiative based on a team of four specialists located regionally, four campus faculty in leadership roles, and several program work teams.

2. Brief description of the target audience

Agricultural/horticulture/natural resource and supporting businesses are targeted both regarding bioenergy production opportunities and information regarding alternative energy sources and conservation. Policy education efforts relate to development of agriculture and natural resources based alternative energy sources.

Consumers, property managers, and community leaders are targeted for information regarding energy supply alternatives and energy conservation options for residential, facilities, and transportation needs. Citizens, community agencies and organizations are targeted for energy-related policy education efforts particularly as related to development of alternative energy sources and the interaction between

land use and energy conservation.

Residents and property owners are targeted with stewardship and waste reduction and management in their homes and on their properties. Businesses, organizations, and producers are targeted with information about reducing impacts of their operations. Local government and community leaders are targeted with information related to governmental management of waste, such as relationship between waste management and land use, effective recycling programs, and road kill management. Environmental planners and managers and technical assistance providers are targeted with in-depth information related to their audiences/constituents. Workforce development professionals receive information on energy and green economy career pathways. Teachers and youth professionals and volunteers are provided with curriculum and training. Youth are targeted with age appropriate education.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	26611	333575	8916	142085

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan:
 Actual: 2

Patents listed

Bromegrass-Smooth Bromegrass Peak (Experimental No. Brome PX)
 Bromegrass-Smooth Bromegrass York (Experimental No. NY 86-B)

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	63

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- (3.1a) # agricultural producers and agribusiness representatives completing educational

programs on the potential for development of biologically-based fuels
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- (3.1b) # local and state leaders completing educational programs on the potential for development of biologically-based fuels such as biodiesel, ethanol, methane, recycled vegetable oils, space heating fuels etc.
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- (3.1c) # agricultural producers and agribusiness, and natural resource business representatives completing educational programs about cropping for bioenergy production
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- (3.2a) # agricultural/horticulture/ natural resource and supporting business representatives completing educational programs about the availability and pros and cons of alternative energy sources and/or about potential energy savings in operations
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- (3.3a) # consumers and community leaders completing educational programs about the availability and pros and cons of alternative energy
Not reporting on this Output for this Annual Report

Output #6

Output Measure

- (3.4a) # consumers, property managers, and/or housing officials completing educational programs about potential energy cost savings, including selecting energy providers, and energy conservation strategies and measures especially related to housing and transportation
Not reporting on this Output for this Annual Report

Output #7

Output Measure

- (3.5a) # community members, leaders and officials completing education programs about the relationships between development patterns and energy use/costs
Not reporting on this Output for this Annual Report

Output #8

Output Measure

- (3.5b) # of workforce professionals, economic developers and/or entrepreneurs participating in educational programs on energy workforce and business opportunities

Not reporting on this Output for this Annual Report

Output #9

Output Measure

- (3.6a) # of agricultural/natural resources producers, and/or organization and business representatives completing educational programs on managing and reducing waste
Not reporting on this Output for this Annual Report

Output #10

Output Measure

- (3.7a) # of local government officials and community leaders completing educational programs on managing and reducing waste and the relationship between waste and land use management
Not reporting on this Output for this Annual Report

Output #11

Output Measure

- (3.8a) # of adult and youth consumers, residents, and landowners completing educational programs on waste reduction and management
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	(3.1d) # agricultural producers, agribusiness, or local and state leaders who demonstrate knowledge gains about the potential for development of biologically-based fuels
2	(3.1e) # forest owners and purchasers of forest products who demonstrate knowledge or skills gains about current markets for firewood and chips/pellets and associated cropping practices
3	(3.1f) # producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop
4	(3.1g) # of existing or new producers documented to have modified existing practices or technologies and/or adopted new production management practices for bioenergy production
5	(3.1h) # of producers, horticulture businesses and/or natural resource managers reporting that cropping for and/or use of bioenergy leads to increased economic returns to their enterprises
6	(3.2b) # agricultural/horticulture/ natural resource and supporting businesses who demonstrate knowledge or skills gains about the availability and pros and cons of alternative energy sources and/or potential energy savings in operations
7	3.2c) # of agricultural/horticultural/ natural resource businesses documented to have adopted appropriate alternative energy sources and/or energy conservation practices
8	(3.2d) # of producers/horticulture businesses/natural resource managers documented to have improved economic returns to agricultural/ horticultural business profitability and vitality resulting from adopting alternative energy sources and/or energy conservation
9	(3.3b) # consumers and/or community leaders who demonstrate knowledge or skills gains about the availability and pros and cons of alternative energy sources especially related to housing and transportation
10	(3.3c) # of consumers documented to have adopted appropriate alternative energy sources
11	(3.3d) # of consumers who report savings on energy costs attributable to adopting alternative energy sources
12	(3.4b) # consumers, property managers, and/or housing officials who demonstrate knowledge or skills gains and/or can articulate specific actions they will take related to energy cost controls and conservation measures especially related to housing and transportation
13	(3.4c) # of consumers reporting to have adopted appropriate energy cost control and/or conservation practices
14	(3.4d) # of property managers, and/or housing officials documented to have taken measures to improve energy cost control or efficiency of existing and new buildings
15	(3.4e) # of consumers who report savings on energy costs attributable to adopting energy conservation measures
16	(3.5c) # community members, leaders and officials who demonstrate knowledge gains about the relationships between development patterns and energy use/costs

17	(3.5d) # of workforce professionals, economic developers and/or entrepreneurs demonstrating knowledge gains related to energy workforce and business opportunities
18	(3.5e) # communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation
19	(3.5f) # of community agencies/ organizations documented to have adopted appropriate alternative energy sources
20	(3.5g) # of new workers trained and energy-related businesses established at least in part due to participation in the program
21	(3.5h) # of communities documented to have established or modified land use and development policies to promote energy conservation
22	(3.5i) # of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources
23	(3.5j) # of communities that report increased diversification of their local economies attributable at least in part to participation in the program
24	(3.6b) # of agricultural/natural resources producers and/or organization and business representatives who demonstrate knowledge gains about waste management and reduction
25	(3.6c) # of agricultural/ natural resources producers and/or organization and business representatives documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste
26	(3.6d) # of agricultural/ natural resources producers and/or organization and business representatives documented to have reduced costs through improved waste management practices
27	(3.7b) # of local government officials and community leaders who demonstrate knowledge gains about waste management and reduction and the relationship between waste and land use management
28	(3.7c) # of local government officials and community leaders documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste
29	(3.7d) # of local government officials and community leaders documented to have established or modified waste management policies to enhance and protect land and water resources and minimize energy costs
30	(3.8a) # of adult and youth consumers, residents, and landowners who demonstrate knowledge gains about waste management and reduction
31	(3.8a) # of adult and youth consumers, residents, and landowners documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste
32	(3.8a) # of adult and youth consumers, residents, and/or landowners, documented to have reduced waste volumes and/or costs
33	Diseases of Biofuel Willows: Identification and Distribution in New York
34	Understanding the Environmental, Social, and Economic Impacts of Gas Exploration and Drilling in the Marcellus Shale
35	Renewable Energy Biomass

36	CCE/EmPower New York Energy & Money Management Education
37	Electronics and Hazardous Waste Recycling Events

Outcome #1

1. Outcome Measures

(3.1d) # agricultural producers, agribusiness, or local and state leaders who demonstrate knowledge gains about the potential for development of biologically-based fuels

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

(3.1e) # forest owners and purchasers of forest products who demonstrate knowledge or skills gains about current markets for firewood and chips/pellets and associated cropping practices

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

(3.1f) # producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	462

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
404	Instrumentation and Control Systems

Outcome #4

1. Outcome Measures

(3.1g) # of existing or new producers documented to have modified existing practices or technologies and/or adopted new production management practices for bioenergy production

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	118

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment

- 404 Instrumentation and Control Systems
- 605 Natural Resource and Environmental Economics

Outcome #5

1. Outcome Measures

(3.1h) # of producers, horticulture businesses and/or natural resource managers reporting that cropping for and/or use of bioenergy leads to increased economic returns to their enterprises

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	79

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
404	Instrumentation and Control Systems

Outcome #6

1. Outcome Measures

(3.2b) # agricultural/horticulture/ natural resource and supporting businesses who demonstrate knowledge or skills gains about the availability and pros and cons of alternative energy sources and/or potential energy savings in operations

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

3.2c) # of agricultural/horticultural/ natural resource businesses documented to have adopted appropriate alternative energy sources and/or energy conservation practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	57

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
404	Instrumentation and Control Systems

Outcome #8

1. Outcome Measures

(3.2d) # of producers/horticulture businesses/natural resource managers documented to have improved economic returns to agricultural/ horticultural business profitability and vitality resulting from adopting alternative energy sources and/or energy conservation

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	47

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
404	Instrumentation and Control Systems

Outcome #9

1. Outcome Measures

(3.3b) # consumers and/or community leaders who demonstrate knowledge or skills gains about the availability and pros and cons of alternative energy sources especially related to housing and transportation

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

(3.3c) # of consumers documented to have adopted appropriate alternative energy sources

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

(3.3d) # of consumers who report savings on energy costs attributable to adopting alternative energy sources

Not Reporting on this Outcome Measure

Outcome #12

1. Outcome Measures

(3.4b) # consumers, property managers, and/or housing officials who demonstrate knowledge or skills gains and/or can articulate specific actions they will take related to energy cost controls and conservation measures especially related to housing and transportation

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

(3.4c) # of consumers reporting to have adopted appropriate energy cost control and/or conservation practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	2064

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

Outcome #14

1. Outcome Measures

(3.4d) # of property managers, and/or housing officials documented to have taken measures to improve energy cost control or efficiency of existing and new buildings

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

(3.4e) # of consumers who report savings on energy costs attributable to adopting energy conservation measures

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1645

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

Outcome #16

1. Outcome Measures

(3.5c) # community members, leaders and officials who demonstrate knowledge gains about the relationships between development patterns and energy use/costs

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

(3.5d) # of workforce professionals, economic developers and/or entrepreneurs demonstrating knowledge gains related to energy workforce and business opportunities

Not Reporting on this Outcome Measure

Outcome #18

1. Outcome Measures

(3.5e) # communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation

Not Reporting on this Outcome Measure

Outcome #19

1. Outcome Measures

(3.5f) # of community agencies/ organizations documented to have adopted appropriate alternative energy sources

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
403	Waste Disposal, Recycling, and Reuse

Outcome #20

1. Outcome Measures

(3.5g) # of new workers trained and energy-related businesses established at least in part due to participation in the program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	45

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

Outcome #21

1. Outcome Measures

(3.5h) # of communities documented to have established or modified land use and development policies to promote energy conservation

Not Reporting on this Outcome Measure

Outcome #22

1. Outcome Measures

(3.5i) # of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
124	Urban Forestry
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

Outcome #23

1. Outcome Measures

(3.5j) # of communities that report increased diversification of their local economies attributable at least in part to participation in the program

Not Reporting on this Outcome Measure

Outcome #24

1. Outcome Measures

(3.6b) # of agricultural/natural resources producers and/or organization and business representatives who demonstrate knowledge gains about waste management and reduction

Not Reporting on this Outcome Measure

Outcome #25

1. Outcome Measures

(3.6c) # of agricultural/ natural resources producers and/or organization and business representatives documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	85

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #26

1. Outcome Measures

(3.6d) # of agricultural/ natural resources producers and/or organization and business representatives documented to have reduced costs through improved waste management practices

Not Reporting on this Outcome Measure

Outcome #27

1. Outcome Measures

(3.7b) # of local government officials and community leaders who demonstrate knowledge gains about waste management and reduction and the relationship between waste and land use management

Not Reporting on this Outcome Measure

Outcome #28

1. Outcome Measures

(3.7c) # of local government officials and community leaders documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	23

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #29

1. Outcome Measures

(3.7d) # of local government officials and community leaders documented to have established or modified waste management policies to enhance and protect land and water resources and minimize energy costs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	19

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #30

1. Outcome Measures

(3.8a) # of adult and youth consumers, residents, and landowners who demonstrate knowledge gains about waste management and reduction

Not Reporting on this Outcome Measure

Outcome #31

1. Outcome Measures

(3.8a) # of adult and youth consumers, residents, and landowners documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #32

1. Outcome Measures

(3.8a) # of adult and youth consumers, residents, and/or landowners, documented to have reduced waste volumes and/or costs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	436

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

Outcome #33

1. Outcome Measures

Diseases of Biofuel Willows: Identification and Distribution in New York

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As fossil fuel resources to power the world's economies move beyond peak supplies and their accessibility becomes mired in political turmoil, exploring new ways to generate power with minimal environmental impact becomes a prudent endeavor. Biofuel willows greatly exceed yields from long-rotation woodlots and is among the most promising technologies for the current century. Willow chips can be burned or converted to ethanol. Either way, they are projected to reduce air pollution and put otherwise marginally productive agricultural land to good use. For example, compared to switchgrass, willows yield approximately the same tonnage, but switchgrass has a narrow timeframe for harvest and loses quality when stored outdoors and produces 3 to 7 times as much ash. They also outproduce corn stover without the ecological consequences such as erosion. But as with other agricultural endeavors, plant pathogenic fungi could cause yield loss.

What has been done

We examined the SUNY-ESF willow biofuels trial plots in Tully, NY at monthly intervals from September, 2008- September 2009, then expanded those surveys to commercial plantations in 2009-2010. We especially looked at collections with the highest potential for commercialization. Our aim: a comprehensive overview of major disease threats to New York willow plantations.

Results

We found few worrisome fungus- or bacteria-caused plant diseases. Among them were black canker (*Glomerella miyabeana*), willow scab (*Venturia saliciperda*), *Leucostoma* canker (*Leucostoma niveum*), and two powdery mildews (*Erysiphe adunca* and *Phyllactinia guttata*). These were common on most clones at the Tully plots, but all were at levels well below threshold. The incidence of leaf rust, however (presumably *Melampsora epitea*) was extremely variable in hybrid willow-yield trial plots in Geneva, Constableville, and Tully NY. Some selections seemed to be immune while others were so susceptible that they were completely defoliated by mid-August. Curiously, some of the most apparently rust resistant selections in the Tully evaluation trials were so susceptible at a site in Groveland, about 200 km to the west, that willows shed leaves 3 weeks earlier than normal. This makes us wonder just how variable the pathogen is in various sites in NY. Commercial willow producers in the Northeast now know of our expertise in willow pathology and are willing to send potential disease samples to our diagnostic laboratory. Growers also seem willing to accept our assertion that premature defoliation from known fungal pathogens has so little impact on yield or cold hardiness at this stage in the evolution of the industry that disease management via fungicides or cultural means is not a prudent endeavor.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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123 Management and Sustainability of Forest Resources

Outcome #34

1. Outcome Measures

Understanding the Environmental, Social, and Economic Impacts of Gas Exploration and Drilling in the Marcellus Shale

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Gas drilling in the Marcellus Shale in the Southern Tier of NYS holds great interest to gas companies, landowners, and communities. Reserves are worth billions of dollars. Many landowners are being approached by gas companies and have questions about fair compensation and property impacts. Meanwhile, municipal officials and citizens are concerned about impacts on environment, watersheds, landscape, infrastructure, and tourism. Research on the socio-economic impact in drilling is urgently needed, as is a stakeholder outreach plan.

What has been done

We did case studies of 4 counties in Pennsylvania and New York document how stakeholders perceive drilling in the early stages of development show. We also presented seven "road shows" that reached about 400 people across the Southern Tier of NYS, bringing a team of Cornell faculty members and extension educators to communities to discuss environmental, community and economic development, and regulatory and leasing issues related to natural gas drilling. We presented a series of webinars to about 240 CCE educators for use in their communities and reached as many as 600 people in communities or organizations that invited us to speak to them.

Results

Our survey reached 1,461 in four counties in NY and PA. People described varying local economic impacts such as business growth, income for leaseholders, tax impacts, and potential for a state severance tax. Many were supportive of drilling if revenues were returned to the areas experiencing growth and increased demand for services. Concerns included the social impact (rapid population growth and the potential for increased inequality among residents) and the impacts on agriculture. Where development is underway, some people reported severe strain on roads and other physical infrastructure?even during the early stages. Others reported heightened

concern for the negative environmental impacts of development and were especially concerned about legacy effects or environmental problems (such as acid mine drainage) that continue long after active drilling is complete. Meanwhile, we have helped communities create task forces, as well as forums that bring together task force representatives from different counties. We get ongoing feedback regarding needs for outreach from CCE educators working directly with landowners in their respective communities. We're also preparing a second-phase road show in the Southern Tier. This research allowed us to garner a \$100,000 grant from the National Science Foundation to reach and engage a broader audience in promoting public understanding so people can make their own scientifically informed decisions regarding their communities and their land.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics

Outcome #35

1. Outcome Measures

Renewable Energy Biomass

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Farmers and landowners are interested in additional revenue streams, as well as positioning themselves for providing source biomass materials for emerging markets in a developing bio-economy. There also is need to provide education and skills that will be necessary for changing workforce requirements.

What has been done

To meet the needs of a community that is interested in renewable energy and workforce development, a CCE Educator proposed developing field demonstration plots located at a local school. Students could help manage, showcase and use the demonstration plots as a way to develop and supplement their own education, as well as being used as a tool to help the

community learn about and see what these renewable energy crops are and how they are planted, grown and harvested. This project demonstrates how these crops can be grown on marginal land not used for food or feed crops.

Results

The Vernon Verona School (VVS) Biomass Lab has provided numerous educational opportunities for the participating students (150 students annually) to learn of biomass crops, participate in the management of the crops, as well as to help conduct research on the crops and conduct tours of the Biomass field plots for the public. Farmers and the general public have toured the plots to learn about these crops and developing markets. During Community Day events in September 2009 and October 2010, 12 field tours, (averaging 35 individuals per tour) were given by researchers, Extension personnel and students. The field demonstration plots of bio-energy crops at VVS were the feature of the National Future Farmers of America (FFA) Organization's filming to highlight the importance of research-based agricultural education in our school systems. The national filming event brought continued recognition to a stellar agricultural program that has been developing demonstration field plots of Shrub Willow, Energy Sorghum and Switchgrass.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
605	Natural Resource and Environmental Economics

Outcome #36

1. Outcome Measures

CCE/EmPower New York Energy & Money Management Education

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As energy prices increase and more households are facing increased economic challenges, there is an increased need for and interest in workshops providing low cost/no cost strategies to assist

households with limited resources. The Public Service Commission determined in 2004 that an important component of the then new EmPower NY Program would be educational strategies targeting the payment challenged consumers of the 6 major utilities in NYS.

What has been done

A contract was developed with Cornell Cooperative Extension (CCE) of Tompkins County to provide statewide leadership for the development and implementation of energy and money management workshops. CCE Associations were recruited, educators provided with the curriculum and workshop materials, database of EmPower Enrollees for recruitment purposes, energy and money management toll kits for workshop attendees, and paid for conducting qualifying workshops. Recognizing that this information is useful to everyone and to avoid any stigma that only persons with low incomes were invited, it was agreed the workshops would be open to the public.

Results

During this reporting year 72 CCE Educators plus staff from partnering organizations attended the annual Inservice training and received the revised Energy Workshop curriculum. Forty-four CCE Associations plus CUCE NYC have signed Agreements to conduct these workshops in their county. As a result, 992 workshops with 12,587 attendees were conducted in this 12 month reporting period. Six hundred and five were Energy Workshops with 8,123 attendees and 387 were money management with 4,464 attendees. Since this partnership started in late 2004 more than 4481 workshops reaching just under 50,000 consumers have been conducted throughout NYS and within NYC. Data indicates that while the workshops are open to the public a significant percentage of attendees are income eligible for the EmPower NY Program. Almost all workshop attendees indicate they would recommend the workshops to others. Many indicate they wish they had had the information sooner especially in the money management area. Feedback from attendees documents that they are using the information gained at the workshops.

4. Associated Knowledge Areas

KA Code	Knowledge Area
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

Outcome #37

1. Outcome Measures

Electronics and Hazardous Waste Recycling Events

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cayuga county residents are often calling Auburn city officials and landfill staff to inquire about the proper way to recycle electronics. Many people often call asking about how to properly dispose of their hazardous waste they find around their homes. Cornell Cooperative Extension (CCE) provides yearly events for people to recycle their used electronics for low or no cost and also provides free proper disposal for household hazardous wastes. Many county residents save their hazardous waste and electronics to bring to these events.

What has been done

CCE partners with the county planning department to organize and carry out these events. Record numbers were seen this year and calls are still coming in every day. A grant from NUCOR Steel provides the funding to hire local recycling companies to unload and take the electronics from the event. This has been wildly popular and we have added an additional event to decrease the strain on staff and volunteers for each event.

Results

Cayuga Recycles events continue to grow both in participants and pounds of materials to be recycled. Spring Home Electronics and Propane Cylinder Recycling events in May 2010 together brought in 961 residents. Tire Roundup in June 2010 brought in 268 residents with 5,000 tires being dropped off. Fall recycling Events had high participation. Fall Home Electronics and Propane Cylinder Recycling events on brought in 593 residents. More than 511 residents recycled electronics and hazardous chemicals in Fall events.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The interaction between natural disasters, the economy, and energy costs is well documented. Weather in particular has interrupted supplies and dramatically influences heating and cooling costs. Appropriations, public policy, and regulations directly affect the ability to pursue energy source alternatives, including bioenergy development, and to implement energy conservation alternatives, particularly for low-income households. Government regulation and policies driven by public priorities can change the circumstances of personal finances and the energy market. Public and private funders and CCE may have fewer fiscal resources and other resources to devote to energy matters although government incentives might offset that.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}