

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Sustainable Energy

Reporting on this Program

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	85%			
605	Natural Resource and Environmental Economics	15%			
	Total	100%			

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	11.0	0.0	0.0	0.0
Actual Paid Professional	11.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
350000	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
558230	0	0	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

The Sustainable Energy planned program at West Virginia University Extension works toward energy independence to develop biomass use for biofuels by designing optimum forestry and crops for bioenergy production. It also works towards improving woodlot conditions and expanding forest and non-timber product production in general.

Educational topics include: reclamation of Marcellus well sites, chestnut for reforestation, switchgrass potential for minesoils, chestnut growth on surface mines, bioenergy crops on surface mines, flow effects on acidity, survival of chestnut trees, biomass for bioenergy, switchgrass biomass stewardship, biomass issues for forest management plans, and workshops on byproduct utilization for bioproducts/bioenergy collaborative research on blueberry waste. One specialist is conducting research on reducing food waste and increasing agricultural byproduct utilization for producing other food products and/or producing bioproducts that will be useful for other applications such as enzymes/catalysts. Another specialist is conducting research on the reclamation of mined land with switchgrass, Miscanthus, and Arundo for biofuel production.

2. Brief description of the target audience

Foresters, government officials, consumers of wood products, commercial enterprises dealing with wood products, Extension staff and faculty.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	862	1000	427	1281

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

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total

Actual	1	2	3
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational materials created or updated about sustainable energy

Year	Actual
2013	14

Output #2

Output Measure

- Number of educational materials about sustainable energy distributed

Year	Actual
2013	0

Output #3

Output Measure

- Number of professional presentations on sustainable energy topics

Year	Actual
2013	1862

Output #4

Output Measure

- Number of training activities related to sustainable energy

Year	Actual
2013	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of stakeholders participating in production/harvesting/storage systems that increase or improve their skills.
2	Number of youth who gain science process skills in biofuels.
3	Number of participants who adopt BMPs for production/harvesting/storage systems.
4	Number of participants who increase their knowledge and skill related to reclamation of Marcellus well sites.

Outcome #1

1. Outcome Measures

Number of stakeholders participating in production/harvesting/storage systems that increase or improve their skills.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	63

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

West Virginia is well-suited to supply forestry wastes for ethanol production and to grow certain energy crops such as switchgrass on marginally productive lands. The state also has tens of thousands of acres of reclaimed surface mine sites which are well-suited for production of energy crops. West Virginia is the nation's second largest coal-producing and third most heavily forested state in the nation. Opportunities exist for the co-development of biomass and coal energy which combine the sustainable qualities of woody biomass and the fuel density of West Virginia coal.

What has been done

Presentations were made at the American Society of Mining and Reclamation national meeting at the National Association of Abandoned Mine Land Meeting. Topics included biomass and coal development opportunities, bioenergy research and development, torrefied biomass and coal blends, energy policy and environmental impacts, and the technical and financial feasibility of coal and biomass as feedstocks for liquid transportation fuels. Other educational topics throughout the year includes: reclamation of Marcellus well sites, chestnut for reforestation, switchgrass potential for minesoils, chestnut growth on surface mines, bioenergy crops on surface mines, flow effects on acidity, biomass for bioenergy: switchgrass biomass stewardship and biomass issues for forest management plans.

Results

Participants gained knowledge of West Virginia surface mine drainage and post-mining land use development, biomass and coal development opportunities, bioenergy research and development, torrefied biomass and coal blends, energy policy and environmental impacts, and the technical and financial feasibility of coal and biomass as feedstocks for liquid transportation fuels.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Number of youth who gain science process skills in biofuels.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

West Virginia citizens need to understand the importance of natural resources and how these resources can be managed to assure they are available for current and future use.

What has been done

West Virginia Extension holds a Conservation Camp each year. Topics and activities include: fish management, forest protection, forest management, forest products, soil conservation, watershed management, water quality, and wildlife management. Approximately 115 youths attend each year.

Results

Each fall, two to three new incoming freshman at WVU select an educational track in the natural resource field after attending our Conservation Camp.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources

Outcome #3

1. Outcome Measures

Number of participants who adopt BMPs for production/harvesting/storage systems.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	303

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An energy audit is the first step to assess how much energy a building or operation consumes and to evaluate what measures can be taken to make buildings or operations more energy efficient.

What has been done

Energy audits were performed to help producers plan for and make decisions to adapt to changing environments and take advantage of economic opportunities offered by climate changed mitigation technologies.

Results

303 producers in West Virginia received an energy audit and made decisions related to adopting climate mitigation technologies to reduce the amount of energy expended in their buildings and operations.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Number of participants who increase their knowledge and skill related to reclamation of Marcellus well sites.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Developing newer and cleaner combustion, while meeting increasing energy demands, is one of the most defining issues of the 21st century. While a variety of natural resources are available to produce energy, the focus on abundant natural gas has increased in the past eight years. West Virginia has a long history in the production of oil and gas. With the discovery of the Marcellus shale and new drilling techniques the state emerges as one of the central natural gas plays in the Appalachian Basin. With this development comes safety and environmental concerns.

What has been done

WVU Extension held 11 educational programs including regional trainings, the second Annual Enhancing Public Awareness of Natural Gas Issues Conference, and in-service training for Extension agents from West Virginia and Pennsylvania. In addition, more than 1,000 people viewed the NGET display and asked questions during the WVU Extension Day at the Legislature in 2013.

Results

Participants (366) increased their knowledge and skills in the environmental impacts of Marcellus shall gas development, reclamation on drilling sites, experiment forest, WV regulations regarding Marcellus shale, WV source water protection program for public water supplies and private wells, WVDEP air quality rules and regulations regarding the natural gas industry, aquatic impacts of Marcellus shall gas development, public health concerns, environmental permit considerations and requirements for natural gas pipeline installation, environmental risk assessment for shale gas development, farming over the Marcellus, overview of water and wastewater treatment for beneficial reuse, and WV erosion and sediment control.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}