

**V(A). Planned Program (Summary)**

**Program # 7**

**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
131	Alternative Uses of Land	10%			
402	Engineering Systems and Equipment	20%			
605	Natural Resource and Environmental Economics	20%			
608	Community Resource Planning and Development	20%			
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	20%			
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%			
	<b>Total</b>	100%			

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	2.3	0.0	0.0	0.0
Actual Paid Professional	1.3	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
1188	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
76121	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

- Produce guides on current energy topics.
- Conduct community meetings on energy topics
- Conduct meetings for agriculture and other landowners on alternative energy topics.
- Partner with agencies, local and tribal government, organizations and industry
- Conduct meetings and seminars on methods for evaluating alternative energy opportunities.

**2. Brief description of the target audience**

- Farmers and Ranchers
- Non-farm or ranch energy users
- Landowners
- Local Government
- Current Community Leadership
- Local Development Entities
- Local Economic Development Entities
- Chamber of Commerce Members
- People interested in becoming involved with creating alternative energy opportunities
- Small businesses by SBA definition

**3. How was eXtension used?**

Extension professionals and clientele are encouraged to use the system as a resource for information and educational materials related to their specific questions and concerns. The Ask an Expert function has been valuable to provide information that is not available in our state.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	3363	24000	0	0

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

**Patent Applications Submitted**

Year: 2011  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2011	Extension	Research	Total
Actual	2	0	2

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Sustainable Energy: Number of people attending workshop/presentations and/or accessing the web site for information about wind energy. Number of people attending workshops/presentations on the pros and cons of various types of bio-fuels or alternative energy sources. Development of educational guides/publications on current energy issues. Workshops/seminars on quantifying the impact of energy generation or savings as it relates to the bottom line of their primary business function. Number of people gathering information from the Extension Energy web site.  
 Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- Energy and Agriculture: Number of people attending workshops/presentations or using the website for information about energy alternative and what criteria to use for decision making on becoming involved with energy generation. (wind, solar, bio-diesel, bio-mass, oilseed production/processing, ethanol etc.) Number of producers attending seminars/demonstrations on using energy saving tillage system practices.

Year	Actual
2011	412

**Output #3**

**Output Measure**

- Energy and Community: Number of people attending workshops/presentations or using the web site on public policy issues related to energy generation and transmission. Number of people participating in workshops/presentations on land leasing issues related to energy generation.

<b>Year</b>	<b>Actual</b>
2011	225

**Output #4**

**Output Measure**

- Residential Energy: Number of homeowners and builders who attend workshops/seminars or accessing the web site on home energy saving/conservation practices. Number of home builders, contractors and crews attending workshops on weatherization techniques in construction of homes. Number of people who gain information about the Camelina Composite Pellet Fuels for home stoves.

<b>Year</b>	<b>Actual</b>
2011	2726

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Energy and Agriculture (reservation and non-reservation) Participants will understand energy alternatives and how to use a framework to evaluate energy opportunities Participants will be able to make a sound decision on becoming involved with energy generation. (wind, solar, bio-diesel, bio-mass, oilseed production/processing, ethanol etc.) Participants will use energy saving tillage system practices.
2	Energy and Community (reservation and non-reservation) Participants will understand the public policy issues related to wind and other alternative energy generation and transmission. Participants will understand land leasing issues related to wind and other alternative energy generation and transmission.
3	Residential Energy: Homeowners will apply home energy savings/conservation practices. Home builders, contractors and crews will use weatherization techniques in constructing homes. Participants will become aware of the Camelina Composite Pellet Fuels for home stoves.

## **Outcome #1**

### **1. Outcome Measures**

Energy and Agriculture (reservation and non-reservation) Participants will understand energy alternatives and how to use a framework to evaluate energy opportunities Participants will be able to make a sound decision on becoming involved with energy generation. (wind, solar, bio-diesel, bio-mass, oilseed production/processing, ethanol etc.) Participants will use energy saving tillage system practices.

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	412

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Evidence of renewable energy as a relevant societal issue was presented in the 2011 State of the Union Address, the US Farm Bill and the Western Extension Directors Association reports from 2006 to present. Of the five NIFA national priorities, sustainable energy is number three. The Association of Public and Land-Grant Universities (APLU) provides additional evidence of the recognized need for Extension involvement in renewable energy education. Energy is one of the APLUs ten major initiatives (APLU, 2011).

#### **What has been done**

The E3A (Exploring Energy Efficiency and Alternatives) curriculum will meet the demand for comprehensive energy education, specific to Montana as related to agriculture, community, and more. The E3A toolkit curriculum has been developed. It is a self-guided, self-contained teaching resource that was developed in collaboration with the University of Wyoming. Content was also provided by Colorado State University and North Dakota State University. A multi-state 12 member issue team of MT and WY agents was formed to develop and review all content.

#### **Results**

Work by the E3A team resulted in over 80 fact sheets of energy content and supporting PowerPoint content. The E3A fact sheets were developed through integration of research and Extension and reviewed by Extension, MSU Wind Application Center, Wyoming School of Energy Resources, NREL, CSU Engineering, economists in MT, WY, and CO and are comprehensive, relevant, and carefully evaluated. The toolkit was launched on November 28, 2011 so impacts of teaching efforts are just beginning. Initial feedback on the training materials has been very positive.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics

#### Outcome #2

##### 1. Outcome Measures

Energy and Community (reservation and non-reservation) Participants will understand the public policy issues related to wind and other alternative energy generation and transmission. Participants will understand land leasing issues related to wind and other alternative energy generation and transmission.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2011	225

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Energy is a sizeable input cost for agricultural producers and a significant expense for nearly all Montanans. Energy prices have been volatile in recent years. Environmental concerns are growing due in part to concern about greenhouse gas levels. Both of these factors have encouraged Montanans to utilize energy more effectively. Unfortunately many Montanans do not have quality information about benefits and costs associated with alternative energy in Montana.

###### **What has been done**

Targeted audiences of farmers and ranchers, as well as non-farm or ranch energy users were assembled in classes both in person and online and delivered proper energy management tools.

###### **Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
605	Natural Resource and Environmental Economics

608 Community Resource Planning and Development

**Outcome #3**

**1. Outcome Measures**

Residential Energy: Homeowners will apply home energy savings/conservation practices. Home builders, contractors and crews will use weatherization techniques in constructing homes. Participants will become aware of the Camelina Composite Pellet Fuels for home stoves.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2011	2726

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Montana consumers have noticed a major difference in their utility bill during the past year; the cost of energy has increased by as much as 65%. With higher utility bills consumers (affluent and low-income) are requesting assistance for energy conservation and weatherization, seeking information on energy efficient construction and remodeling and purchasing Energy star appliances. By applying basic energy conserving principles (at current energy costs), consumers can reduce their home utility cost by an average of 21% about \$156/year. Weatherization applied to older homes can save as much as 65% about \$780. In both cases, the savings payback is typically 1-4 years; truly a good investment.

**What has been done**

Classes/workshops were conducted for contractors, home owners, housing authorities, tribal members, real estate agents, home inspectors, waste water treatment operators, health departments and Extension agents.

**Results**

Thirty one training programs were provided directly to 326 energy related contractors. The training resulted in the weatherization of 2400 homes throughout Montana, reducing home energy consumption by an average of 33% or an estimated \$345.00/year/household, a savings of \$828,000. Indirectly, approximately 24,000 Montana households received energy education using Extension publications and consumer education materials.

**4. Associated Knowledge Areas**



<b>KA Code</b>	<b>Knowledge Area</b>
402	Engineering Systems and Equipment
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

#### **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
- Competing Programmatic Challenges

##### **Brief Explanation**

{No Data Entered}

#### **V(I). Planned Program (Evaluation Studies)**

##### **Evaluation Results**

The impacts in this area are focused in three areas: Energy and Agriculture, Energy and Community, and Residential Energy. Outcomes have focused on results of decision making related to energy efficiency and energy alternatives.

##### **Key Items of Evaluation**

The program area will continue to focus on Energy Efficiency and Alternatives.