

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

### **Program # 8**

#### **1. Name of the Planned Program**

Sustainable Energy

#### **2. Brief summary about Planned Program**

The goals of this Work Team team are to:

- educate a core group of extension agents about renewable energy options and energy efficiency.
- broadly educate all extension agents on the basics of renewable energy.

Ultimately, we hope Extension will be seen as the educational entity of choice in the area of clean energy.

Strategies include developing fact sheets for the general public, identifying additional outside resources to support this work and partnering with community agencies to deliver educational programming.

Long term deliverables include:

- develop demonstration sites
- deliver short term classes
- partner with campus faculty
- develop green jobs program for schools
- develop school enrichment materials using STEM based standards

**3. Program existence :** Intermediate (One to five years)

**4. Program duration :** Medium Term (One to five years)

**5. Expending formula funds or state-matching funds :** Yes

**6. Expending other than formula funds or state-matching funds :** Yes

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
132	Weather and Climate	1%		0%	
402	Engineering Systems and Equipment	1%		0%	
605	Natural Resource and Environmental Economics	1%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	97%		0%	
	<b>Total</b>	100%		0%	

**V(C). Planned Program (Situation and Scope)**

1. Situation and priorities

**Ag Energy**

Energy costs for common agricultural operations in Colorado can range from just over 30% of total operating costs (sugar beets) to over 50% of total operating costs (wheat) (<http://www.ers.usda.gov/AmberWaves/April06/Features/Energy.htm>). At the same time, a 2009 regional survey of western agricultural and natural resource Extension educators identified energy efficiency on farms and ranches as one of five priority needs for more information ([http://wsare.usu.edu/news/pdf/WS10\\_2010\\_133734.pdf](http://wsare.usu.edu/news/pdf/WS10_2010_133734.pdf)). A 2008 survey of Extension agents in Colorado showed that 74% of agents rated their assessment of interest by the general public in renewable energy in their communities to be high or very high. At the same time, less than 10% of agents thought that "a great deal of assistance" was provided for energy-related services by entities in Colorado, and 47% of agents thought that Extension was providing "very little assistance" (Western Region Extension Energy Survey, 2008). A 2011 survey of agricultural producers in the San Luis valley showed that 89% of these producers were interested in learning more about renewable energy, yet only 9% felt they had the technical and financial information to make a decision about renewable energy for their operation. In that same survey, 66% of respondents would "have an energy audit done by a professional at a reasonable price" (Paluzzi, 2011).

The importance of expanding education and research efforts in agricultural energy is further validated in that the Association of Public and Land Grant Universities (APLU) identified "creat[ing] pathways to energy independence" as one of seven Strategic Programming Opportunities for Extension at the national level for 2010 and beyond (<http://www.aplu.org/NetCommunity/Document.Doc?id=2019>).

The Ag Energy work team allows CSU faculty to better communicate and collaborate on research and education projects related to ag energy as well as apply for grants and develop outside partnerships when opportunities arise. This will result in more effective energy information services provided to rural Colorado residents with agricultural operations.

**Consumer Energy**

Energy issues have gained prominence in recent years due to the economic crisis, climate change, the BP oil spill, and otherwise. In Colorado, one of the most aggressive renewable portfolio standards in the nation has been adopted as part of the state's move toward a New Energy Economy.

In addition, a 2008 survey of Extension agents in Colorado showed that 74% of agents rated their assessment of interest by the general public in renewable energy in their communities to be high or very

energy-related services by entities in Colorado, and 47% of agents thought that Extension was providing "very little assistance" (Western Region Extension Energy Survey, 2008).

In response, the Consumer Energy team strives to provide unbiased information on energy issues of most relevance to consumers in order to help them make environmentally and financially sound energy decisions.

### **Colorado Energy Masters**

Energy issues have gained prominence in recent years due to the economic crisis, climate change, the BP oil spill, and otherwise. In Colorado, one of the most aggressive renewable portfolio standards in the nation has been adopted as part of the state's move toward a New Energy Economy. With 59 offices in Colorado, staff expressing a high level of interest in energy issues, and a wealth of clean energy research being generated on campus, CSU Extension is well positioned to provide unbiased, timely energy information to Colorado residents and small businesses.

That said, demands on Extension staff are increasing due to budget shortfalls and otherwise and staff in general cannot devote much time to becoming local energy experts. Therefore in order to be effective at fulfilling Extension's mission of disseminating locally relevant, research-based information to the public throughout the state, Extension must engage a network of citizens and volunteers.

The Colorado Energy Master program has been developed in order to help Colorado residents and small businesses make educated energy decisions. This occurs through the participation of both volunteers and non-volunteers in the program coursework. The program can also provide some degree of training and exposure for those interested in a career in the clean energy field, particularly in the field of home energy audits.

## **2. Scope of the Program**

- In-State Extension
- Multistate Extension
- Integrated Research and Extension

## **V(D). Planned Program (Assumptions and Goals)**

### **1. Assumptions made for the Program**

#### **Assumptions:**

##### **Ag Energy**

- Agricultural professionals and producers will continue or increase their levels of interest in clean energy issues.
- There is value in conducting outreach to help these constituents better understand clean energy options and the plethora of ever-changing financial incentives related to them.
- Producers will implement low- or no-cost energy conservation, energy efficiency, and renewable energy measures if provided with needed information.
- The costs of clean energy will continue to become more attractive and competitive versus fossil fuel energy sources.

##### **Consumer Energy**

Individuals, businesses, and local governments will continue or increase their levels of interest in clean energy issues.

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options and the plethora of ever-changing financial incentives related to them.

Residents will implement low- or no-cost energy conservation, energy efficiency, and renewable energy measures if provided with needed information.

The costs of clean energy will continue to become more attractive and competitive versus fossil fuel energy sources.

**Colorado Energy Masters**

- Interest in clean energy in Colorado communities will be maintained or increase.
- Home and small business owners can benefit from unbiased information and tools on energy efficiency and renewable energy in terms of reducing fossil fuel energy use in a cost-effective manner.
- Volunteers receiving 30 hours of training on energy efficiency and renewable energy in Colorado will be capable of and effective at conducting basic home energy assessments and serving as energy educators in their communities.

**2. Ultimate goal(s) of this Program**

- Ag Energy 2) Agricultural producers in Colorado are empowered to make decisions for growing crops to be used as biofuel
- Clean Energy 1) - Coloradans are empowered to make environmentally and financially sound energy decisions.
- Energy Masters 2) Colorado citizens have a broad, research-based context for understanding energy issues.

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

**1. Estimated Number of professional FTE/SYs to be budgeted for this Program**

Year	Extension		Research	
	1862	1890	1862	1890
2013	4.9	0.0	0.0	0.0
2014	0.7	0.0	0.0	0.0
2015	0.7	0.0	0.0	0.0
2016	0.7	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0

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

**1. Activity for the Program**

- Clean Energy - Ag - "Plug and play" media presentations made available to Extension agents
- Clean Energy - Ag - Agricultural energy audits conducted
- Clean Energy - Ag - Agricultural energy research projects
- Clean Energy - Ag - Gallons of on-farm biofuels consumed

- Clean Energy - Ag - Graduate students working in bioenergy labs
- Clean Energy - Ag - Increased revenue estimated from bioenergy crops and/or production (in dollars)
- Clean Energy - Ag - Number of acres for oilseed crops as biofuels
- Clean Energy - Ag - Undergraduates working in bioenergy labs
- Clean Energy - Ag - Number of variety trials for crops as biofuels
- Clean Energy - Annual savings estimated from investments in energy efficiency and/or renewable energy (in dollars)
  - Clean Energy - Capital invested in energy efficiency and/or renewable energy (in dollars)
  - Clean Energy - Certified Master Volunteers (of those related to Volunteers)
  - Clean Energy - Community Coalitions, Collaborations, Alliances Formed to Address a Specific Issue [list specific groups/issue]
    - Clean Energy - Community Meetings Convened [examples: Advisory Groups, Councils, Coalition Meetings, Boards]
    - Clean Energy - Community Meetings Facilitated [examples: Focus Group, Citizen Forum, Round Table Dialogue, Strategic Planning Process]
  - Clean Energy - Direct Communication/Education by telephone and/or e-mail
  - Clean Energy - Educational materials distributed
  - Clean Energy - Energy Masters - Certificates of completion for teacher license renewals
  - Clean Energy - Energy Masters - CEUs earned by realtors in the Colorado Association of Realtors
  - Clean Energy - Energy Masters - Counties offering the Colorado Energy Master program
  - Clean Energy - Energy Masters - Educational contacts
  - Clean Energy - Energy Masters - Energy block parties
  - Clean Energy - Energy Masters - Home energy assessments
  - Clean Energy - Energy Masters - Non-volunteers successfully completing all Energy Master coursework
    - Clean Energy - Energy Masters - Value of volunteer hours
    - Clean Energy - Energy Masters - Volunteer hours
    - Clean Energy - Energy Masters - CEUs earned by US Green Building Council LEED professionals
    - Clean Energy - External Grant Dollars
    - Clean Energy - New Technologies Expected to be Adopted by Producers
    - Clean Energy - Newsletters (This is number of newsletters, not number mailed or number of Coloradoans who received them.)
      - Clean Energy - Peer Reviewed Publications, including Fact Sheets & Curricula
      - Clean Energy - Press/News Release or Column (number submitted)
      - Clean Energy - Trainings for Extension Staff
      - Clean Energy - Trainings for Volunteers
      - Clean Energy - Trainings/Classes/Workshops, Field Days, Activity Days
      - Clean Energy - User Fees
      - Clean Energy - Volunteers (total) in Planned Program
      - Clean Energy - Websites (number of hits)
      - Clean Energy - Websites (number of Websites)

**2. Type(s) of methods to be used to reach direct and indirect contacts**

**Extension**

Direct Methods	Indirect Methods
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<ul style="list-style-type: none"><li>• Education Class</li><li>• Workshop</li><li>• Group Discussion</li><li>• One-on-One Intervention</li><li>• Demonstrations</li><li>• Other 1 (eXtension)</li></ul>	<ul style="list-style-type: none"><li>• Public Service Announcement</li><li>• Newsletters</li><li>• TV Media Programs</li><li>• Web sites other than eXtension</li></ul>
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### 3. Description of targeted audience

1) We have two main audiences - agricultural professionals such as Extension agents and NRCS personnel as well as the agricultural producers they serve.

2) The program is available to all adults as well as to high school juniors and seniors so as to offer youth an opportunity to get involved in their communities and pursue a topic not traditionally taught in school.

- The program offers professional development credits (CEUs) for realtors, LEED professionals, and teachers. In addition to these groups, retirees (particularly retired engineers), sustainability professionals, environmental educators, other CSU "Master" volunteers, and community college, University, and high school students will be targeted.

- The program will be capable of training individuals with little prior knowledge of energy issues in the basics of energy efficiency and renewable energy as well as how to conduct a basic home energy assessment, possibly to include a home "solar audit" using utility bill history, a rooftop analysis, a Solar Pathfinder, and web-based analysis tools.

3) In the Western Region Extension Survey of 2008, energy efficiency/conservation on the farm/ranch, wind energy, and bioenergy were identified as the three most common requests for information among Colorado agents. These requests were closely followed by energy efficiency/conservation in the home, solar PV, and energy costs and comparisons. Based on survey results, it is clear that our primary audiences are 1) rural energy users and 2) residents

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

## **V(H). State Defined Outputs**

### **1. Output Measure**

- Number of volunteers supporting clean energy
- Number of partnering agencies/organizations around clean energy
- Number of Extension Agents trained
- Clean Energy - Energy Masters - CEUs earned by realtors in the Colorado Association of Realtors
- Clean Energy - Energy Masters - Certificates of completion for teacher license renewals
- Clean Energy - Energy Masters - Number of Counties offering the Colorado Energy Master program
- Clean Energy - Energy Masters - Number of Non-volunteers successfully completing all Energy Master coursework
- Clean Energy - Energy Masters - CEUs earned by US Green Building Council LEED professionals
- Clean Energy - Number of Community Coalitions, Collaborations, Alliances Formed to Address a Specific Issue
- Clean Energy - Number of Community Meetings Convened [examples: Advisory Groups, Councils, Coalition Meetings, Boards]
- Clean Energy - Number of Community Meetings Facilitated [examples: Focus Group, Citizen Forum, Round Table Dialogue, Strategic Planning Process]
- Clean Energy - Energy Masters - Number of Energy block parties
- Clean Energy - Number of Press/News Releases or Columns submitted
- Clean Energy - Number of Newsletters (This is number of newsletters, not number mailed or number of Coloradans who received them.)
- Clean Energy - Ag - Number of Agricultural energy audits conducted
- Clean Energy - Number of Direct Communications/Education by telephone and/or e-mail
- Clean Energy - Number of Educational materials distributed
- Clean Energy - Energy Masters - Number of Home energy assessments
- Clean Energy - Energy Masters - Value of volunteer hours (hours x \$21.62 nationally recognized value of volunteer time/hour, adjusted for Colorado)
- Consumer - Number of Loans of energy audit equipment



- Consumer - Number of Loans of power monitors
  - Clean Energy - Energy Masters - Number of Educational contacts
  - Clean Energy - Energy Masters - Number of Volunteer hours
  - Clean Energy - Amount of External Grant Dollars
  - Clean Energy - Amount of User Fees Collected
  - Clean Energy - Number of Websites (not number of Website hits)
  - Clean Energy - Number of Websites hits (not number of Websites)
  - Consumer and Ag Energy - Number of Uploads of multimedia
  - Consumer and Energy Masters - Number of Entries using social media
  - Clean Energy - Annual savings in dollars) estimated from investments in energy efficiency and/or renewable energy
  - Clean Energy - Capital invested in energy efficiency and/or renewable energy (in dollars)
  - Clean Energy - Number of Certified Master Volunteers (of those related to Volunteers)
  - Clean Energy - Number of New Technologies Expected to be Adopted by Producers
  - Clean Energy - Number of Trainings for Extension Staff
  - Clean Energy - Number of Trainings for Volunteers
  - Clean Energy - Number of Trainings/Classes/Workshops, Field Days, Activity Days
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Clean Energy 1.1) Participants analyze options for cost-effective energy conservation, efficiency, and/or renewable energy measures.
2	Clean Energy 1.2) Participants take advantage of financial incentives for energy efficiency and/or renewable energy.
3	Clean Energy 1.3) Participants conduct a basic energy assessment.
4	Clean Energy 1.4) Participants implement cost-effective energy conservation, efficiency, and/or renewable energy measures.
5	Energy Masters 2.1) Participants more closely follow and better comprehend energy-related news.

**Outcome # 1**

**1. Outcome Target**

Clean Energy 1.1) Participants analyze options for cost-effective energy conservation, efficiency, and/or renewable energy measures.

**2. Outcome Type** : Change in Action Outcome Measure

**3. Associated Knowledge Area(s)**

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Clean Energy 1.2) Participants take advantage of financial incentives for energy efficiency and/or renewable energy.

**2. Outcome Type** : Change in Action Outcome Measure

**3. Associated Knowledge Area(s)**

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Clean Energy 1.3) Participants conduct a basic energy assessment.

**2. Outcome Type** : Change in Action Outcome Measure

**3. Associated Knowledge Area(s)**

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

#### **4. Associated Institute Type(s)**

- 1862 Extension

#### **Outcome # 4**

##### **1. Outcome Target**

Clean Energy 1.4) Participants implement cost-effective energy conservation, efficiency, and/or renewable energy measures.

**2. Outcome Type :** Change in Action Outcome Measure

##### **3. Associated Knowledge Area(s)**

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

#### **4. Associated Institute Type(s)**

- 1862 Extension

#### **Outcome # 5**

##### **1. Outcome Target**

Energy Masters 2.1) Participants more closely follow and better comprehend energy-related news.

**2. Outcome Type :** Change in Action Outcome Measure

##### **3. Associated Knowledge Area(s)**

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

#### **4. Associated Institute Type(s)**

- 1862 Extension

### **V(J). Planned Program (External Factors)**

#### **1. External Factors which may affect Outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

**Description**

Economic conditions and changes in public policy could drive outcomes up or impede success, depending on the direction of the changes. This work was organized as a "strategic initiative team" in fall, 2009. NIFA priorities and progress by the team are reflected in showing the work as a planned program for 2011. A new Clean Energy specialist, hired for a three-year fixed term position, leads this work.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

Specific indicators will guide program evaluation in the coming year.