

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy - Renewable Energy Alternatives for Small Islands

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
401	Structures, Facilities, and General Purpose Farm Supplies			50%	
402	Engineering Systems and Equipment			50%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.1	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
0	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
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The two remaining research projects active in the Sustainable Energy program were completed during 2014. One of the projects proposed and established a solar energy photovoltaic system at one of PRAES substations to both reduce the high cost of electricity at its facilities, and to serve as a model for potential adopters of this technology. The system established followed an on-grid configuration using the infrastructure provided by the electric power authority, which, depending on its policies, either pays or provides credit for the power generated. The experience accumulated in the implementation of the system is being shared with stakeholders interested in the adoption of this technology in their farming operations.

The other project concluded a case-study of the technical and economical aspects involved in implementing solar energy systems in milking parlors. The study provided an analysis with which local customers, specifically from the farming sector, could establish projections and make decisions about the implementation of similar systems. A written report of the project's conclusions was submitted to the local Department of Agriculture's division of innovation and agricultural development. In addition, several presentations were delivered to government officials and interested academic faculty.

2. Brief description of the target audience

- (1) Specialists and County Agents of the Agricultural Extension Service of UPR.
- (2) Professional personnel of the Puerto Rican Department of Agriculture and of the USDA.
- (3) Policy makers in the Commonwealth and Federal Governments.
- (4) Personnel of the Farm Credit Service and other financial institutions that make loans to producers.
- (5) Professionals engaged in private enterprises related to renewable energy projects.
- (6) Faculty members and university graduate and undergraduate students.
- (7) Farmers and managers of agroindustrial operations.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of active research projects in the program

Year	Actual
2014	2

Output #2

Output Measure

- Number of new proposals submitted targeting the program's priorities

Year	Actual
2014	0

Output #3

Output Measure

- Number of popular (non-refereed) publications based on research results

Year	Actual
2014	1

Output #4

Output Measure

- Number of meetings held with stakeholders to extend results and technologies

Year	Actual
2014	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants in meetings held with stakeholders to extend project's results and technologies devised
2	Number of government agencies and other type of institutions willing to collaborate in projects promoting energy efficiency and renewable energy technologies
3	Number of farmers or agroindustrial operations becoming more energy efficient and adopting renewable energy alternatives

Outcome #1

1. Outcome Measures

Number of participants in meetings held with stakeholders to extend project's results and technologies devised

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #2

1. Outcome Measures

Number of government agencies and other type of institutions willing to collaborate in projects promoting energy efficiency and renewable energy technologies

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #3

1. Outcome Measures

Number of farmers or agroindustrial operations becoming more energy efficient and adopting renewable energy alternatives

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes

Brief Explanation

This program was created four years ago. Only a few projects were active in this area and the time commitment of researchers to them was relatively small.

Availability of continued funding for research and for incentives for public adoption of technologies is vital for achieving progress in this program. The recession and increasing cost of inputs may limit farmers' ability to adopt technologies with long-term payoffs.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

An evaluation of the implementation process of this program was conducted in November 2013 and reported in last year's annual report. The following comments offered by participants in an online survey of faculty interested in the program offer insights on both the strengths and limitations of these initial years of the program:

- Respondents remarked that it would be hard to implement some of these projects when little funding is available.
- Nevertheless, some believed we now have two good case studies on energy that can be showcased in upcoming years and can be used for evaluating the program's success.
- This program, as well as many others, is limited to researchers in the field that are willing to undertake research that could lead to energy savings on farms. More expertise is needed within the CAS in this area.
- The program activities should have closer ties with extension and farmers so that a participatory research approach can be implemented.

The current integration of research and extension in our combined Plan of Work may facilitate the implementation of new initiatives in sustainable energy but in the near future

only extension faculty will be conducting work in this program.

Key Items of Evaluation