V(A). Planned Program (Summary)

Program # 6

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	10%		0%	
125	Agroforestry	5%		0%	
131	Alternative Uses of Land	5%		0%	
511	New and Improved Non-Food Products and Processes	80%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.0	0.0
Actual Paid	1.1	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**
79867	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
76966	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

Extension assisted communities on use of biomass products and worked with producers to develop value-added forest products. Outreach helped educate the public on using biomass and biofuels. Faculty worked with communities and organizations regarding the use of biomass and with producers interested in biomass production. Research and outreach efforts addressed public education on the sustainability of biomass harvesting, new technologies and community planning.

2. Brief description of the target audience

The target audiences included producers and consumers, communities, agriculture and forestry businesses, industry leaders, entrepreneurs, individuals and groups concerned about the quality of the Alaska environment, public resource agencies, public and private resource managers, other faculty researchers, and undergraduate and graduate students. Efforts were directed toward environmentally, economically sustainable development and conservation of our natural resources that benefit citizens and help them adapt and become resilient as the climate changes. Advisors and stakeholders included various forestry organizations, greenhouse managers, Alaska Farm Bureau, the Alaska Wood Energy Task Force, Alaska Energy Authority, the Alaska Department of Natural Resources, borough governments and Alaska Native corporations.

3. How was eXtension used?

eXtension was not used in this program.

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	251	1140	78	60

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output 1: Workshops, demonstrations, short courses, classes, field days and conferences on sustainable energy issues organized and conducted.

Year	Actual
2018	19

Output #2

Output Measure

- Output 2: Community, organizations and one-on-one consultation concerning bio-based energy opportunities conducted.

Year	Actual
2018	53

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome 1: Maintain a forestry biomass database.
2	Outcome 2: Monitor adoption of bioenergy technologies.
3	Outcome 3: Increase community awareness about the use of biomass and other sustainable energies.

Outcome #1

1. **Outcome Measures**

Outcome 1: Maintain a forestry biomass database.

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Outcome 2: Monitor adoption of bioenergy technologies.

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Outcome 3: Increase community awareness about the use of biomass and other sustainable energies.

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	231

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustainable energy is an increasingly popular issue in Alaska where transportation and heating costs are prohibitive. In the face of declining oil prices and production, there is a need for Alaska to invest in alternative energies. A fundamental shift in the state's energy focus requires constituent support to gain momentum. Community-level change begins with improving knowledge and awareness at the individual level, and Extension is uniquely situated as source of research-based information that can provide outreach across Alaska on relevant energy topics.

What has been done

The energy specialist held biomass, biochar and greenhouse-heating presentations for contacts at venues like the experiment farm and conferences. The energy specialist also conducted workshops for 231 participants on wood burning, greenhouse heat, gasification, solar energy and biochar in five different Alaska communities. The energy specialist and two research engineers from the Alaska Center for Energy and Power revised an Alaska-specific solar design manual. The manual was originally created in 1981 by a former extension agent and is in its fifth edition.

Results

An interdisciplinary partner provided preliminary information to interested community members, including tribal leaders and decision-makers at the Alaska Village Cooperative (AVEC). Required social capital will be evaluated for AVEC to determine what is needed for their viability as a candidate for use of a biomass-fired combined heat-and-power system. Applications of these findings have the potential to contribute to energy self-sufficiency, job creation, local food production, student learning and engagement, and climate change mitigation. The updated solar guide was made available to the public for a nominal fee and includes information on solar design, components, current standards and codes, solar economics and financing, solar heating technologies, passive solar heating, and active solar water heating.

4. Associated Knowledge Areas

KA Code	Knowledge Area
125	Agroforestry
511	New and Improved Non-Food Products and Processes

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

Alaska continues to be severely impacted by the falling price of crude oil. The state provides a significant portion of the university's funds, and the university has experienced several consecutive years of reductions. About 40 percent of SNRE funding comes from the state. Between 2014 and 2018, the university system's budget dropped from $378 million to $317 million. SNRE, in particular, has faced difficulties with the combination of budget cuts and fixed-cost increases. In FY18, there were no research FTEs allocated to the sustainable energy area.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Workshop attendees were able to gain hands-on experience enhancing greenhouse heating options. Demonstrations were held at public events with a Gasification

Experimenter's Kit (GEK) biomass gasifier. Results of sustainable energy outreach efforts came primarily in the form of capacity building, as connections were made with multiple community organizations that can help further the awareness of biomass potential in the state.

A needs assessment survey of landowners was conducted and 17 landowners responded, with 15 indicating they were interested in a workshop or training about forestry to help them expand their knowledge, process firewood, learn management practices, or develop in their career. Eleven indicated they had not previously used Extension for forestry resources, with many mentioning that they had not heard of Extension before or did not know it offered forest-related information. Respondents rated fire risk and pest damage as their greatest concerns, and most were interested in better managing their lands for firewood productivity and sustainability. Twelve provided contact information to receive follow-up information on wood energy-related topics.

Key Items of Evaluation

Public awareness was raised of biomass uses in Alaska. Landowners indicated increased awareness of Extension forestry and wood energy resources and plan to seek more information on sustainable forest management.