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Benefits, Barriers, and Opportunities for Renewable Energy Outreach in Extension: A Mixed-Methods Needs Assessment

Blake H. Thomas
Utah State University

BENEFITS, BARRIERS, AND OPPORTUNITIES FOR RENEWABLE ENERGY OUTREACH IN EXTENSION: A MIXED-METHODS NEEDS ASSESSMENT

by

Blake H. Thomas

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Approved:

_____	_____
Dr. Roslynn G.H. Brain Major Professor	Dr. Richard S. Krannich Committee Member
_____	_____
Dr. Edwin R. Stafford Committee Member	Dr. Mark R. McLellan Vice President for Research and Dean of the School of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

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ABSTRACT

Benefits, Barriers, and Opportunities for Renewable Energy Outreach in Extension: A Mixed-Methods Needs Assessment

by

Blake H. Thomas, Master of Science

Utah State University, 2016

Major Professor: Dr. Roslynn G.H. Brain
Department: Environment and Society

A large-scale transition to renewable energy sources will become increasingly appealing as the issues of federal regulation, climate change, and decreased fossil fuel energy return on energy investment become more prevalent. Although renewable resources remain a small portion of the nation's and Utah's energy portfolio mix, current power purchase agreements indicate an impending boom. Cooperative Extension should play an integral role in the transition to renewable resources on the national, state, and local levels. The purpose of Extension is to provide objective, research-based, and credible information to improve local communities. There is a great opportunity for Extension agents to be trusted experts in educating and assisting farmers, ranchers, and homeowners in transitioning to renewable energy systems. This thesis identified the benefits, barriers, and opportunities for renewable energy outreach in Extension. Data were collected through a nationwide online survey and focus group interviews, in addition to a Utah-based online survey. The nationwide survey and interviews revealed a

need and demand for increased renewable energy programming in Extension. This need became further evident after a nationwide inventory discovered that only twenty-two of fifty states have distinct renewable energy departments, programs, or discipline areas. A Utah-based needs assessment revealed that fifty-nine percent of Utah State University (USU) Extension employees agreed that there was a need for a statewide renewable energy specialist. Additionally, more than fifty-five percent of employees agreed that there was an internal and public demand for USU Extension to provide and receive renewable energy information, programs, education, and outreach. The Utah-based survey also revealed differing perceptions of the environmental harmfulness of common energy sources. Different attitudes toward conventional and renewable energy sources demonstrated the need for unbiased, properly messaged delivery of desired renewable energy programs.

(234 pages)

PUBLIC ABSTRACT

Benefits, Barriers, and Opportunities for Renewable Energy Outreach in Extension: A Mixed-Methods Needs Assessment

Blake H. Thomas

Renewable energy is energy from a source that is not depleted when used, such as solar, wind, geothermal, biofuel, and hydroelectric power. Renewable energy sources are a powerful combatant to climate change because they emit little to no carbon dioxide emissions in the electrical generation process. This mixed-methods needs assessment explored the benefits, barriers, and opportunities for renewable energy outreach in Extension on a nationwide and Utah-based scale. Two online surveys and focus group interviews revealed the relative dearth of renewable energy programming currently underway in Extension nationwide. In Utah, more than fifty-five percent of Utah State University (USU) Extension respondents agreed that there was a need for a renewable energy specialist. More than seventy percent of USU Extension respondents' preferred renewable energy programs to be delivered through a website, fact sheets, and in-person workshops. This study provides a framework upon which nationwide Extension offices may construct energy programs.

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CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Extension's Formation

The Morrill Act of 1862 (7 U.S.C. § 301) was passed by the United States Congress and subsequently signed into law by President Abraham Lincoln. This Act, and its second provision in 1890 (7 U.S.C. § 321), provided federal support for land-grant universities (Rogers, 1988). The original mission of land-grant universities was to provide a practical education to the working class (Association of Public and Land-grant Universities, 2012). Further, land-grant universities offered an opportunity for children of the working class to obtain a higher education (Rasmussen, 1989). President Woodrow Wilson extended the efforts to bring higher education to the working class by signing the Smith-Lever Act of 1914 (7 U.S.C. § 341). The Smith-Lever Act provided federal funds for land-grant institutions to enhance and extend the application of useful and practical information through Cooperative Extension Services (Extension). Wayne Rasmussen (1989, p. 3) described Extension's partnership with land-grant institutions as such:

> Then came a new concept, which Cooperative Extension embodied, that the knowledge within the land-grant institutions should be made available to those not attending those institutions and should continue to be available throughout one's life. Thus was the university brought to the people.

Extension's Relevancy in the 21st Century

When Congress passed the Smith-Lever Act of 1914, over 50% of the United States' population lived in rural areas and 30% of the workforce was engaged in farming (National Institute of Food and Agriculture, 2015). In 2014, just two percent of the United States' population claimed farming as an occupation (American Farm Bureau Federation, 2015). Considering Extension's origins in agricultural outreach, recent publications have questioned the relevance of Extension in the 21st century (Bull, Cote, Warner, & McKinnie, 2004; Extension Committee on Organization and Policy, 2002; Franz & Cox, 2012; McDowell, 2004). As the nation continues to move away from an economy of agrarian occupational dominance, Extension has experienced increased pressure to fund and support programs that connect with larger audiences.

Utah State University Extension (USU) is an example of such program diversification; offering outreach in marriage counseling, outdoor tourism, and personal finance. While there are myriad ways in which Extension might connect with an increasingly urban 21st century audience, this thesis investigates the need for developing or expanding existing energy programming, outreach, and education within USU Extension and Extension nationwide. Several Extension employees nationwide have proposed sustainable living programs as a means of bolstering Extension's relevancy in the 21st century (Apel, Jones, & McDonald, 2013; Elliott et al., 2008; Simon-Brown, 2004). The topic of energy is a prominent rural and urban sustainability issue in need of being addressed now and in the future (Brain, Upton, & Tingey, 2015; McCollum, Krey, & Riahi, 2011). More specifically, renewable energy programming, outreach, and

education could be the intersection where Extension's relevancy is revived by means of energy-focused sustainable living programs.

The History of Energy in Extension

The nexus of agriculture and energy is apparent in the language of the amended Smith-Lever Act (7 U.S.C. § 341 Pub. L. 95-113). The Act states:

> In order to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture, uses of solar energy with respect to agriculture, home economics, and rural energy, and to encourage the application of the same, there may be continued or inaugurated in connection with the college or colleges in each State, Territory, or possession…

Given that two of the Act's four charges are directly related to energy topics, one might expect a surplus of energy programs and publications within Extension. The *Journal of Extension*, the official refereed journal for Extension, illuminates the litany of scholarship devoted to energy topics since its inception in 1962. Using the Journal's internal web-based search engine, results show more than 480 articles relating to "energy development," 150 articles relating to "energy efficiency and conservation," and 70 articles relating to "renewable energy."

Notwithstanding the abundance of Extension scholarship on energy issues, one of the nation's leaders in Extension energy programming argues that despite Extension's "long, if intermittent, record of offering programming on energy issues," current activity is "relatively poorly defined" (Geiger, 2014). Geiger (2014) further states, "…agriculture has clearly delineated components, such as range management, 4-H livestock judging, horticulture, or soil fertility, but no such clear focus has emerged for Energy Extension."

Considering that modern society is built upon energy, Extension programs could benefit from having a distinct energy component with specific attention given to renewable energy technologies and systems.

Need for Renewable Energy Programming in Extension

The modern societal relevance of renewable energy development can be seen in President Barack Obama's Administration making the largest investment in renewable energy technologies in American history, resulting in the doubling of the United States' renewable energy generation from solar, wind, and geothermal since 2009 (Zichal et al., 2012). From an economic standpoint, the solar industry alone represented almost 1.3% of all new American jobs in 2014, with 97,031 solar installers compared to 93,185 coal miners (The Solar Foundation, 2015). Global investment and research groups have articulated that "renewable technologies [are] transforming markets and business models around the world" (Bloomberg New Energy Finance, 2015). Therefore, "finding new ways to produce energy is of paramount importance" (Goldman Sachs, 2014). These trends are not going unnoticed by Extension personnel. For example, a nationwide survey of Extension employees was conducted in 2008 to determine energy interests and needs. The two highest ranked topics of interest to clientele were wind and solar energy information (Kluchinski, 2012).

In 2012, an entire Master of Science thesis at Montana State University was dedicated to renewable energy program design and implementation (Hamlen, 2012). The thesis resulted in an Extension curriculum on energy efficiency and small renewable

energy technologies for the home, farm, and ranch. After the launch of the Exploring Energy Efficiency & Alternatives (E^3A) curriculum, Montana State University, the University of Wyoming, Colorado State University, and the Association of Public and Land-grant Universities hosted the inaugural National Extension Energy Summit in the spring of 2013.

Extension is well suited to deliver topical renewable energy information in an unbiased, research-based manner. The late Extension Specialist Leigh Fortson declared:

> Extension agents across the country are in the best possible position to both introduce this new industry [renewable energy] to America's farmers and ranchers, and support them through the tides of change. In doing so, we'll help create a crop of entirely new possibilities. (Fortson, 2006)

To remain relevant, Extension must be a player in the "critical discussions [that] are shaping new energy policy, industry regulation, and market investment, which are setting the stage for rural America to provide the energy of tomorrow" (Romich & Bowen-Ellzey, 2013).

The Rise of Renewable Energy

This thesis explores the renewable energy opportunities in Extension nationwide, and specifically within USU Extension. Nationwide, renewable resources used for electricity and heat are expected to grow by 3.4% in 2015 (Energy Information Administration, 2015). Despite Utah's national ranking of 46 in renewable energy production, the state currently has 811 megawatts (MW) of renewable energy projects signed to power purchase agreements (Energy Strategies, 2015; United States Department of Energy, 2015). For context, Utah had only 611 cumulative MW of

installed renewable energy projects in 2013 (American Council on Renewable Energy, 2014). This rising growth and interest in renewable energy brings attention to the expanding role it might play in Extension programming.

Existing Renewable Energy Efforts in Extension

A nationwide inventory of renewable energy programmatic efforts was conducted as a preliminary measure of this mixed-methods needs assessment. Key personnel were identified from each Extension program, and then were contacted by electronic mail or phone to confirm what type, if any, of renewable energy programs their office offers.

Table 1-1 shows that 24 out of 50 (48%) states have centralized or distinct Extension energy programs in place. The seventeen states considered to have "energy involvement without a distinct program" participated in sporadic or dated energy activities that are not recognized as a core program. These states often provided out-of-date fact sheets or had one-time grant funding relating to renewable energy.

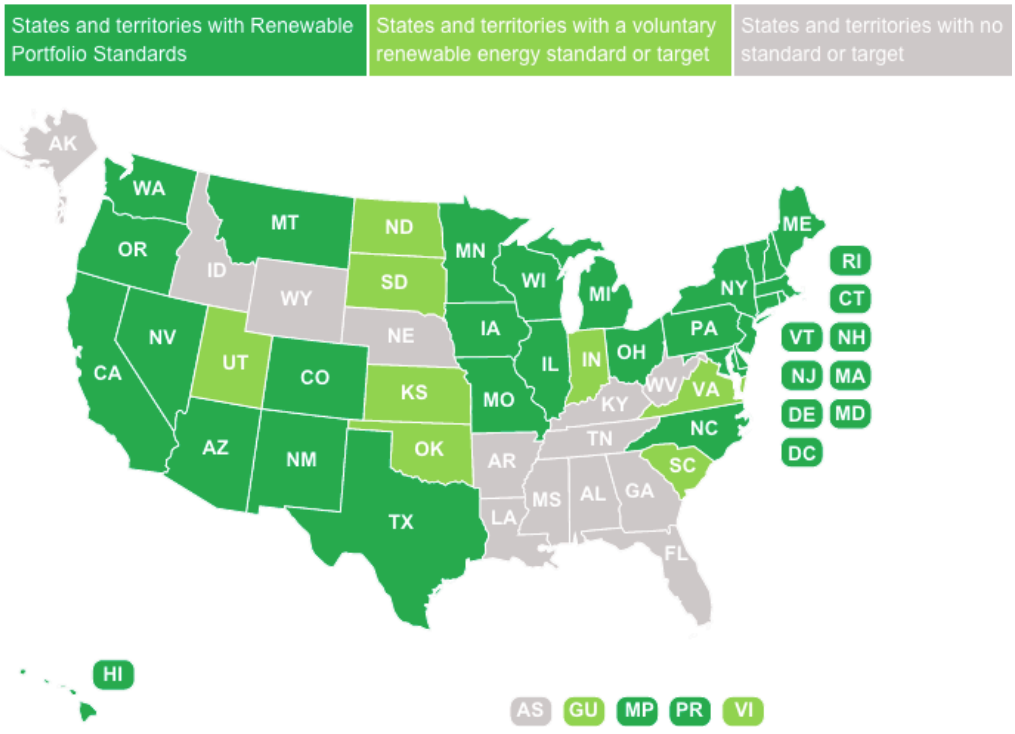
Table 1-1.
Nationwide Inventory of Energy Programs in Extension.

State	Centralized or distinct energy program	Energy specialist or similar title	Energy involvement without distinct program	No reported energy involvement or specialist	Renewable Portfolio Standard
AL		X			
AK	X	X			
AZ	X	X			X
AR			X		
CA			X		X
CO	X	X			X
CT			X		X
DE				X	X

FL			X		
GA			X		
HI				X	X
ID			X		
IL	X	X			X
IN	X	X			
IA	X	X			X
KS				X	
KY			X		
LA	X	X			
ME	X	X			X
MI	X	X			X
MN	X	X			X
MS			X		
MO	X	X			X
MT	X	X			X
NE	X	X			
NV			X		X
NH			X		X
NJ	X	X			X
NM			X		X
NY	X	X			X
NC			X		X
OH	X	X			
OK			X		
OR			X		X
PA	X	X			X
RI	X	X			X
SC			X		
SD				X	
TN	X	X			
TX				X	
UT	X				
VT			X		X
VA	X	X			
WA	X	X			X
WV			X		
WI	X	X			X
WY	X	X			

The last column indicated whether the state had a renewable portfolio standard (RPS) or not. The RPS is a regulatory mandate to increase production of energy from renewable sources such as wind, solar, biomass and other alternatives to fossil and nuclear electric generation (National Renewable Energy Laboratory, 2015). Currently, twenty-nine states have an RPS in place (See Figure 1-1), while eight have voluntary goals or targets. Sixteen of the twenty-nine (55%) states with an RPS also had distinct Extension energy programs or specialists. There were only three states that had an RPS and no Extension involvement in energy programming. The connection between Extension's involvement in renewable energy programming and a state RPS suggests the influence that regulatory measures might have on Extension priorities.

Figure 1-1. Nationwide Map of Renewable Portfolio Standards



(National Conference of State Legislatures, 2015)

Thesis Purpose and Research Questions

The research in this thesis highlights nationwide and Utah-based opportunities and barriers of renewable energy in Extension, in additional to the internal and public demand for renewable energy programming within USU Extension. The nationwide survey seeks to build on themes highlighted by the University of Wyoming's Energy Extension Coordinator, who noted, "the internal appetite for more robust Extension involvement in energy sustainability issues is apparent" (Geiger, 2014). The USU Extension survey offers Utah's perspective to compare against a 2012 master's thesis that found Extension educators in Montana, Wyoming, and Colorado had "a general lack of knowledge and awareness about renewable energy programming" (Hamlen, 2012). Additionally, the information assists USU Extension Sustainability's program, which provides publications on renewable energy systems, to understand USU Extension's internal demand for a renewable energy specialist.

This study is guided by following research questions:

<u>Nationwide Online Survey</u>

1) What are the opportunities for and barriers to renewable energy education, outreach, and programming in Extension?
2) What are the size and scale of renewable energy projects that Extension agents engage?
3) What is the perceived clientele support and interest in renewable energy programming?

Nationwide Focus Group Interviews

1) Do renewable energy programs exist in participants' respective states?
2) If a participant oversees an Extension renewable energy program, what is the primary function and role of that program?
3) What are the most effective message framing and communication techniques for delivering renewable energy programs in Extension?

USU Extension Online Survey

1) Is there a public demand for USU Extension to provide renewable energy education, outreach, and programs?
2) Is there an internal demand for USU Extension faculty and staff to receive renewable energy information?
3) Is there a need or demand for a renewable energy specialist within USU Extension?

As a note to the reader, the Utah-specific research does not focus on bioenergy because of USU Extension's existing Utah Biomass Resources Group and Center for Agronomic and Woody Biofuels.

Thesis Structure

This thesis is prepared in a multi-paper format. There are two main chapters that have been prepared for publication, which aim to offer insight on the benefits and barriers of renewable energy programming in Extension. The data used in this research were collected during the spring of 2013, the fall of 2013, and the summer of 2014.

Chapter 2 discusses research data collected from attendees at the National Energy Extension Summit (online survey) and the National Extension Sustainability Summit (focus group interviews). Descriptive statistics are used to provide Extension employees and clientele with an understanding of the contemporary opportunities associated with renewable energy outreach and programming. Chapter 3 discusses USU Extension's majority support for a renewable energy specialist position, as well as a demand for internal and public renewable energy outreach. The Utah-based survey results in this chapter offers an Extension perspective from those who are not actively working on renewable energy initiatives; providing a unique contrast to the survey results discussed in Chapter 2. Descriptive statistics are used to demonstrate the interest in renewable energy programs. Pearson's chi-square test is used to show USU Extension's differing attitudes toward the harmfulness of electricity generating sources across the state. The statistically significant differences in energy attitudes across the state illuminate the need to properly message and communicate renewable energy programs. Chapter 4 provides conclusions and recommendations from the research as a whole.

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CHAPTER 2

OPPORTUNITIES AND BARRIERS FOR RENEWABLE ENERGY OUTREACH IN EXTENSION: A MIXED-METHODS NEEDS ASSESSMENT[1]

Abstract

This paper illuminates the far-reaching applications that renewable energy programming offers Extension employees' rural and urban clientele. An online survey was sent to attendees of the inaugural National Extension Energy Summit, which revealed the need for increased energy programming in Extension. Following survey analysis, focus group interviews were conducted at the National Extension Sustainability Summit to determine the best way to respond to the reported need for energy programming. The results provide readers with an understanding of the role and relevancy that renewable energy programming can provide Extension in the 21st century.

Introduction

In the face of climate change, geopolitical tension, and diminishing returns on energy investments, a clean and secure energy supply is one of the most pressing societal issues of the 21st century. One of Extension's earliest energy outreach efforts was the integration of electricity to rural homeowners in partnership with the Rural Electrification Administration from the 1930s to 1950s (Geiger, 2014). During the 1970s oil crisis, multiple authors of Extension publications began arguing that energy is an important topic in which Extension should provide education and expertise (Born, 1980; Hamlen, 2012; Liles, 1978). Since the 1970s, many of Extension's energy programs became

[1] This manuscript was co-authored by Blake H. Thomas and Dr. Roslynn Brain

sporadic or nonexistent (Western Extension Directors Association, 2008). Today, the mounting importance of a clean and secure energy supply can be seen in the Obama Administration's policies, which have contributed to a doubling of the United States' renewable energy generation since 2008 (White House, 2012).

As the nation moves away from an economy of agrarian dominance, recent publications have questioned Extension's relevancy in the 21st century (Bull, Cote, Warner, & McKinnie, 2004; Extension Committee on Organization and Policy, 2002; Franz & Cox, 2012; McDowell, 2004). Renewable energy outreach and education could be the intersection where Extension's relevancy is revived by providing instruction and practical demonstration that applies to both rural and urban individuals, households, and communities.

Given the rising societal relevance of renewable energy generation, and growing interest in this type of information, a mixed-methods needs assessment was completed to examine what type of programming Extension currently offers on the topic and its associated opportunities and restraints. This article discusses the results of that needs assessment, conducted to better understand the self-identified benefits of and barriers to renewable energy outreach within Extension from the faculty that are pioneering this emerging field.

Methods

The research study consisted of two parts: an online survey and focus group interviews. The online survey was distributed in March 2013 to all attendees of the inaugural National Energy Extension Summit in Fort Collins, Colorado. The Summit had

57 eligible attendees, all of whom received the survey instrument via e-mail. Participants were eligible if they worked for Extension and their primary job responsibilities involved energy programming, outreach, or education. The survey was designed around Dillman's Tailored Design Method with minor modifications (Dillman, Smyth, & Christian, 2009). Participants were electronically sent a pre-notice letter, two follow-up reminder letters, and a thank you note upon completion (with approval of the university's Institutional Review Board).

Extension faculty from Utah State University, the University of Wyoming, Colorado State University, and the University of Montana piloted the survey. The survey consisted of 27 questions, six of which were brief demographic questions. Due to the limited amount of literature on renewable energy in Extension, the survey used an exploratory approach. Topics covered in the survey included: (1) the opportunities and barriers of renewable energy in Extension, (2) the size and scale of renewable energy projects that Extension agents engage in, and (3) perceived clientele support and interest in renewable energy programming.

Of the survey's 27 questions, 11 used a 5-point Likert agreement scale for response choices. The survey also included ranked-order and open-ended questions. Results were analyzed using the Statistical Package for Social Sciences (SPSS) software package.

The focus group interviews were conducted October 2013 at the inaugural National Extension Sustainability Summit in Park City, Utah. The interviews served as an opportunity to further expound upon the themes that emerged from the exploratory online

survey distributed earlier that year. Interview facilitators were given nine questions to guide the discussion. The nine questions explored: (1) the existence, role, and importance of renewable energy outreach in participants respective Extension offices, (2) the opportunities for and constraints on renewable energy programming, outreach, and education within Extension, and (3) the message framing, marketing, and communication of renewable energy programs to clientele. Five facilitators conducted hour-long focus group interviews with 26 Extension employees from across the nation. Participants were selected for their role in Sustainable Living programs; most had expertise in energy programming. The interviews were recorded and transcribed verbatim, then analyzed using open, axial, and selective coding techniques (Neuman, 2013).

Results

The online survey achieved a 72% response rate, and the 26 focus group participants (and five facilitators) represented 52% of National Extension Sustainability Summit attendees that opted-in to and met participant selection criteria for the interview.

Descriptive statistical analyses to the online survey results and focus group coding resulted in four common themes emerging from the data in each study. Therefore, survey and focus group results presented hereafter are merged, offering breadth and depth to the following four themes that appeared most frequently in both data collection instruments:

1) There is a need for increased energy programming in Extension.

This theme was mentioned 62 times during the focus group interviews, while the second most frequent theme was mentioned 39 times. A focus group participant stated, “We have maybe a few people who know something about this [renewable energy

outreach and education], but they may not know enough. I think some thoughtfulness needs to be given…to assembling the people who are experts within our system and then reaching out to others." The experts who are already delivering renewable energy programs in Extension have been received well. Their assessment of public reception to renewable energy programs is outlined in Table 2-1.

2) Extension's history of providing unbiased, research-based information must remain central to renewable energy programming and outreach efforts.

Extension's purpose is to "provide useful, practical, and research-based information" to communities of all sizes (Cooperative Extension System Offices, 2014). This theme appeared multiple times in open-ended comments on the online survey and

Table 2-1.
Level of Agreement to Statements about Clientele Reception to Renewable Energy Programming in Extension

	Ranking*						
	1	**2**	**3**	**4**	**5**	**Mean**	**N**
The majority of my clientele are open to the idea of renewable energy as an alternative energy source.	0 (0%)	1 (3%)	10 (30%)	16 (49%)	6 (18%)	3.82	33
In teaching about renewable energy, I feel my approach connects well with my clientele.	0 (0%)	0 (0%)	7 (21%)	19 (58%)	7 (21%)	4.00	33
I receive more positive than negative feedback regarding the renewable energy outreach materials and training I have delivered.	0 (0%)	1 (3%)	5 (15%)	13 (39%)	14 (43%)	4.21	33

*1 = Strongly Disagree; 5 = Strongly Agree

was highlighted frequently in all five focus group interviews. Extension employees perceived that this was their niche, or their strongest point of leverage and influence. A focus group participant summarized this sentiment by stating: “The advantage of Extension is that we have over 100 years of history being recognized as providing unbiased, research-documented information. We’re not trying to sell anything or promote any particular product, and that’s what we do best.” Extension’s unbiased reputation makes them an ideal third party educator between homeowners/landowners and their utilities. Additionally, Extension has the opportunity to widen its influence by bringing distributed-scale (i.e., the generation of electricity at some point or points other than a central station power plant) renewable energy information to agricultural landowners as well as urban dwellers.

3) Extension needs to form partnerships with outside existing energy entities to best serve the public.

The need for Extension to collaborate with local energy providers, non-profits, and other outreach groups was mentioned 26 times during the focus group interviews. Partnering with other existing energy groups was cited as an opportunity for knowledge sharing and as a way to compensate for busy schedules with few opportunities for new or added responsibilities.

A focus group participant stated, “We always feel like our capacity isn’t what we want it to be. I am a little shorthanded. I think that’s a recurring theme that we’ve been hearing all day. There’s so much to do.” When Extension offices collaborate with outside

local energy stakeholders, it will foster communication between the two groups that prevents duplicated efforts. Partnerships will also ensure that Extension employees working in energy are making the most of their time.

4) Cost is the principal driver and barrier in Extension clientele's renewable energy decisions.

The most frequently referenced issue that Extension respondents identified about their clientele was the financing of distributed-scale renewable energy projects. Financial decision-making was often reported as the primary driver to the completion of renewable energy projects in states with favorable incentives and regulations. Conversely, financial restrictions were more frequently cited as the chief barrier to distributed-scale renewable energy transitions when energy prices were low and incentives were minimal. Table 2-2 illustrates the top ranking that most survey respondents gave financial resources as a barrier to clientele renewable energy decisions.

The high startup cost of renewable energy systems is commonly cited as a challenging adoption barrier in public attitude and opinion research (Fratanduono, Steelman, & Petersen, 2013; International Economic Development Council, 2011; Reddy & Painuly, 2004). Extension can play an important role with farmers, ranchers, and homeowners through communicating state and federal incentives, geographical considerations, and loan options. As the demand for renewable energy information increases, these four themes can help to further advocate and direct Extension's efforts in renewable energy outreach and education.

Table 2-2.
Ranking of Barriers to Extension Clientele's Renewable Energy Decisions

	Ranking*						
	1	**2**	**3**	**4**	**5**	**Mean**	**N**
Lack of financial resources	23 (74%)	3 (10%)	3 (10%)	2 (6%)	0 (0%)	1.48	31
Lack of understanding of technology	4 (13%)	18 (58%)	5 (16%)	3 (10%)	1 (3%)	2.32	31
Lack of access to the technology	1 (3%)	11 (36%)	14 (45%)	4 (13%)	1 (3%)	2.77	31
Lack of renewable energy sources (e.g. sunlight, wind)	0 (0%)	1 (3%)	8 (26%)	14 (45%)	8 (26%)	3.94	31
Opposed to renewable energy	2 (7%)	1 (3%)	4 (13%)	5 (16%)	19 (61%)	4.23	31

*1 = Extreme barrier, 5 = Not a barrier

Applications for Extension Employees

The International Energy Agency projects that renewable energy sources (specifically solar) will be the world's biggest single source of electricity by 2050 (International Energy Agency, 2014). Renewable energy expertise, training, and programming will ensure that Extension is at the forefront of solving the nation's energy challenges. Connecting renewables to traditional Extension foci will:

- Reinforce Extension's role of disseminating research-based and unbiased information to the public.
- Illuminate Extension's energy role among federal and state entities.
- Bolster Extension's relevancy in the 21st century.

An open-ended comment from the online survey stated, "The key is to determine how to broaden Extension's audience regarding clean energy." A clean and secure energy supply has universal relevance – its importance is not limited to agricultural producers or landowners. Therefore, renewable energy programming, outreach, and education offer reinforcement to Extension's relevancy.

This paper may be used as a framework for Extension offices that do not yet offer energy programming. For those already engaging clientele in renewable energy information, the four themes may serve as points in which to anchor programmatic efforts:

1) There is a need for increased energy programming in Extension.
2) Extension's history of providing unbiased, research-based information must remain central to renewable energy programming and outreach efforts.
3) Extension needs to form partnerships with outside existing energy entities to best serve the public.
4) Cost is the principal driver and barrier in Extension clientele's renewable energy decisions.

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CHAPTER 3

RENEWABLE ENERGY'S ROLE IN UNIVERSITY OUTREACH TO THE PUBLIC: A PERSPECTIVE FROM UTAH COOPERATIVE EXTENSION[1]

Introduction

Utah's population has nearly tripled since 1970 and is projected to nearly double by 2050 (Utah Foundation, 2014). Expected population3 growth will create an increasingly urban population with increased energy demands (OED, 2014). Contributors to the June 2013 issue of *Rural Connections* highlighted the promise that renewable resources might have in meeting Utah's future energy needs:

- "Renewable energy resources are distributed throughout the West in far greater abundance than in any other region in the country" (Herbert, 2013).
- "Renewable energy development can bring important benefits to places like Beaver County [Utah]. The creation of many construction-phase jobs, along with expenditures on goods and services by developers and workers during the construction period, can provide a substantial short-term boost to rural economies" (Robertson and Krannich, 2013).
- "Renewable energies, such as wind, solar, and geothermal technologies, increasingly pose significant, if novel, economic opportunities to revitalize western, rural communities and steer them onto cleaner, more sustainable paths" (Stafford and Hartman, 2013).

[1] This manuscript is co-authored by Blake H. Thomas and Dr. Roslynn Brain

Renewable resources are growing at an exponential rate despite their seemingly modest role in Utah's energy portfolio. In 2012, renewable resources accounted for 1.8% of Utah's production portfolio and 2.4% of its consumption portfolio (Vanden Berg, 2014). The distinction between these two percentages (production vs. consumption) is attributed simply to the fact that Utah is an exporter of electricity, sending 25% of its approximately 10,000 gigawatt hours to consumers in other states. This exportation of electrons creates distinct profiles for what a state consumes versus what it generates, and in Utah's case the profile of the electricity we consume is less carbon intensive because most of the electricity we export is generated by coal.

In 2013, about 4.7% of Utah's net electric generation came from renewable resources (EIA, 2014). Installed solar doubled to 18 megawatts (MW) in 2014, while wind remained at 325 MW (AWEA, 2015; SEIA, 2015). Currently, there are approximately 970 MW of renewable energy projects signed with power purchase agreements in Utah (Energy Strategies, 2015). The nature of energy generating resources is changing; moving from more consistent to more intermittent, from more carbon-intensive to less, and from more centralized to more distributed in nature.

The increase in utility-scale (e.g., large wind farms or solar arrays) and distributed (e.g., rooftop solar) renewable resources in Utah's energy mix illuminates the need for unbiased, research-based energy information for rural and urban clientele. In the face of calls for relevancy, and a heightened interest in sustainable living programs, the time for Extension to carve its space in the energy sector is now (Brain, 2014; Bull et al., 2004).

And despite an intermittent history of energy outreach, the internal appetite for more robust Extension involvement in energy issues is apparent (Geiger, 2014).

This article will discuss the findings of a survey sent to all Utah State University (USU) Extension employees in the summer of 2014. The intent of the survey was to gauge attitudes and views toward renewable energy outreach, education, and programming. The survey achieved an 83% response rate (n=195) and the results have applications to Extension professionals in the Intermountain West and nationwide.

Methods

An online survey was sent to all USU Extension employees (faculty, staff, administration, specialists, experts, etc.) through Qualtrics Survey Software. Dillman's Total Design Survey Method was utilized; which included an introductory e-mail to participants, three unique follow-up reminders to non-responders, and a thank you note following survey completion (Dillman, 2007). Results were analyzed using the Statistical Package for Social Sciences version 22 software.

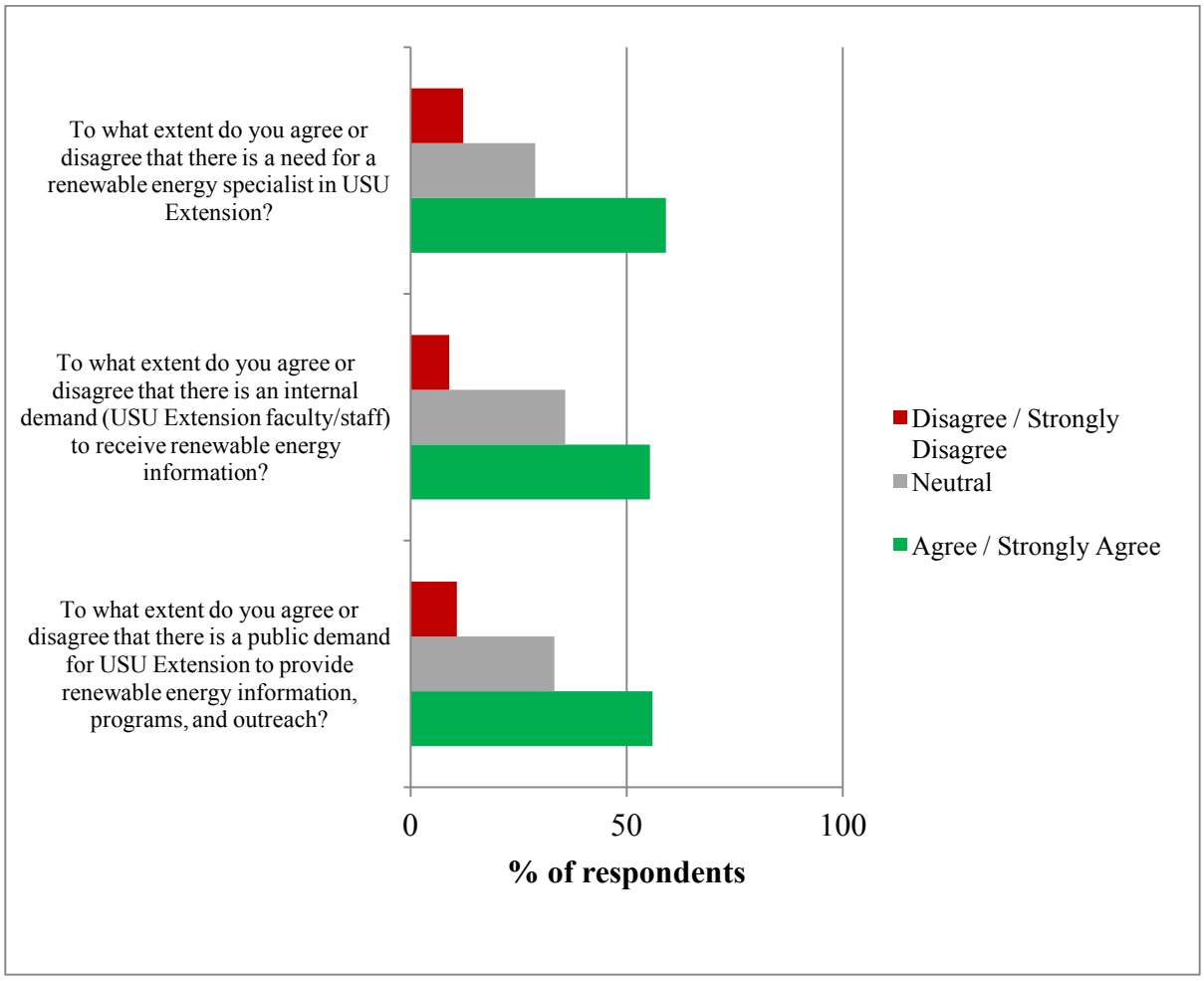
Results

Outside of biomass programming, USU Extension's primary source for renewable energy information is the USU Extension Sustainability program. The Extension Sustainability program is led by a sustainable communities specialist with a purview that includes the topic areas of energy, land, water, air, and food. The survey was conducted on behalf of the Extension Sustainability program and the key objectives were to discover USU Extension's level of agreement of (1) the public demand for USU Extension to

provide renewable energy information, programs, and outreach; (2) the internal demand for USU Extension to receive renewable energy information; and (3) the need for a renewable energy specialist in USU Extension. Given that energy is only one of five outreach areas communicated by one program leader in Utah in combination with the growing adoption of renewable energy technologies statewide, the final objective was to gauge whether a demand existed for focused statewide energy expertise.

Respondents demonstrated strong interest in increased renewable energy information, programs, and expertise within USU Extension (See Figure 3-1). The majority (total respondents and percentage noted in parentheses) indicated that they "strongly agreed" or "agreed" there was public demand for USU Extension to provide renewable energy information, programs, and outreach (n=84, 56%); there was internal demand for USU Extension to receive renewable energy information (n=87, 55.4%); and there was a need for a renewable energy specialist in USU Extension (n=92, 59%).

The majority support for increased renewable energy involvement within USU Extension occurred despite differing energy attitudes across the state. Respondents were broken into three subgroups to evaluate if geographic location in the state affected energy attitudes and values. The three subgroups were divided into campus specialists, urban-based county employees, and rural/small urban-based county employees. Rural and urban locations were determined using the Economic Development Corporation of Utah's *Wasatch Front Profil*e. Campus specialists were those located on USU's campus in Logan, Utah. Many of them were university professors who dedicated partial time to Extension. Urban respondents were those located in county offices within the Wasatch



Survey scale consisted of "Strongly Disagree," "Disagree," "Neutral," "Agree," "Strongly Agree," and "Don't Know". Reported scale merged "Strongly Disagree" and "Disagree" as well as "Strongly Agree" and "Agree" due to sample size limitations. Respondents who selected "Don't Know" were excluded from analysis.

Figure 3-1.
USU Extension employees' interest in renewable energy outreach.

Front region. The Wasatch Front includes Utah's four most populous counties and is home to nearly 80% of the state's population (EDCUtah, 2007). Rural/small urban respondents included all county offices and Extension employees located outside of the Wasatch Front region.

To better understand energy attitudes among Extension personnel located across the state, the following question was asked:

- Some ways of generating electricity may be harmful to the environment because they produce air pollution, water pollution, toxic wastes, or other environmental problems. How environmentally harmful do you think each of these power sources is?
    - Power sources: Coal-fired power plants, wind energy, solar energy, geothermal energy, hydro power, nuclear energy, oil-fired power plants, and natural gas-fired power plants.
    - Response options: Very harmful, moderately harmful, somewhat harmful, slightly harmful, not harmful at all, and don't know.

A Pearson's Chi-Square test was performed to indicate whether there was a relationship across the three subgroups in terms of perceptions of how environmentally harmful different power sources were. The Pearson's Chi-Square test compares the observed subgroup frequencies to those you might expect to occur in the subgroup by chance. Table 3-1 provides context to the Pearson's Chi-Square test results found in Table 3-2. For example, Table 3-1 illuminates the tendency for rural/small urban respondents to be much less likely to consider coal-fired power plants harmful than is the case for those who are from urban settings or those who are campus specialists.

The Pearson's Chi-Square test, indicating whether there was a relationship across the three subgroups perceptions of how environmentally harmful different power sources

Table 3-1. Response Frequencies Comparing the Three Subgroups' Responses to "How environmentally harmful do you think coal-fired power plants are?"

	Campus Specialists: *Total Responses (Percent of Subgroup Responses)*	**Urban:** *Total Responses (Percent of Subgroup Responses)*	**Rural/Small Urban:** *Total Responses (Percent of Subgroup Responses)*
Very Harmful / Moderately Harmful	42 (74%)	35 (78%)	38 (53%)
Somewhat Harmful	10 (17%)	7 (15%)	17 (24%)
Slightly Harmful / Not Harmful At All	5 (9%)	3 (7%)	16 (23%)
Total	57 (100%)	45 (100%)	71 (100%)

Reported scale merged "Very Harmful" and "Moderately Harmful" as well as "Slightly Harmful" and "Not Harmful At All" due to sample size limitations. Respondents who selected "Don't Know" were excluded from analysis.

Table 3-2. Pearson's Chi-Square Test Comparing the Three Subgroups' Perceived Harmfulness of Each Method of Generating Electricity.

	Pearson χ^2 Value	**Degrees of Freedom**	**P-value (2-sided)**
Coal-fired Power Plants	10.875	4	.028
Wind Energy	10.300	4	0.022
Solar Energy	16.539	4	0.001
Geothermal Energy	7.737	4	0.090
Hydro Power	21.060	4	0.000
Nuclear Energy	5.455	4	0.249
Oil-fired Power Plants	4.588	4	0.339
Natural Gas-fired Power Plants	5.395	4	0.253

were, was statistically significant at the $p \leq 0.05$ level for the following power sources: coal-fired power plants, wind energy, solar energy, and hydro power. Differences in responses to the question involving geothermal energy were statistically significant at the $p \leq 0.10$ level.

As previously mentioned, rural/small urban respondents perceive coal-fired power plants to be less environmentally harmful than campus specialists or urban respondents. Interestingly, rural/small urban respondents also tended to be less critical of renewable resources than their campus specialist counterparts. For example, campus specialists considered wind energy "somewhat harmful" (21%) at much higher rates than urban (6%) and rural/small urban (5%) respondents. Campus specialists were also more likely to perceive solar energy as "somewhat harmful" (13%) compared to urban (0%) or rural/small urban respondents (0%). Additionally, more campus specialists (11%) and urban respondents (15%) perceived geothermal energy to be "somewhat harmful," while rural/small urban respondents selected that response option less frequently (1%). Finally, hydro power also drew high contrast, with campus specialists (38%) and urban respondents (19%) selecting "somewhat harmful" more frequently than rural/small urban respondents (7%).

The statistically significant differences in perceived harmfulness of various power generating sources between the subgroups confirms diverging attitudes toward fossil fuels and renewable resources. At the same time, it is important to note that a majority of respondents across all three subgroups did express support for renewable energy programming.

Conclusions

The survey results indicate that there is a demand for renewable energy programming within USU Extension. An immediate way for USU Extension to provide meaningful renewable energy support to clientele across the state, and to find a niche among existing energy organizations, is to address the respondents' perceived barriers to renewable energy development. The following barriers are those that USU Extension employees deemed greatest for their clientele:

1. Upfront costs of renewable energy systems are too expensive.
    - 88.8% of respondents agree / strongly agree.
2. The process of transitioning to renewable energy sources is too complex.
    - 48.1% of respondents agree / strongly agree.
3. Renewable energy technologies are too risky.
    - 33.6% of respondents agree / strongly agree.
4. Geographic location is unsuitable for renewable energy systems.
    - 16.1% of respondents agree / strongly agree.

Additionally, respondents gave clear direction on what structure and form of delivery they perceived to be most effective in addressing clientele concerns:

1. Energy website maintained by USU Extension.
    - 83.2% of respondents agree / strongly agree.
2. Fact sheets.
    - 79.8% of respondents agree / strongly agree.
3. In-person workshops.

- 71.5% of respondents agree / strongly agree.

4. Renewable energy specialist to refer to.

    - 67.5% of respondents agree / strongly agree.

The principal barriers and preferred forms of energy information delivery represent the immediate needs that a clean energy specialist could address. The differing energy attitudes among subgroups serves as a reminder that renewable energy programming within USU Extension should be framed in a way that reflects the values and political beliefs of each of the subgroups (Stafford et al., 2012). This non-divisive approach will ensure alignment with the core tenant of the Extension system – providing unbiased, research-based information to the public.

In a conservative, fossil resource rich (e.g., natural gas, coal, and crude oil account for approximately 95% of Utah's energy production) state like Utah, the majority support for increased renewable energy programs in USU Extension gives promise to those seeking support for this type of initiative in other states. The generality of the renewable energy barriers can also provide direction to those states whose Extension efforts are already involved in renewable energy outreach. In summary, the time for Extension to secure its place in the emerging renewable energy industry is now.

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CHAPTER 4

RESULTS, IMPLICATIONS, AND CONCLUSIONS

Results and Implications

This project was carried out from April 2013 to October 2014. The nationwide survey collected results from participants representing each census region of the United States (U.S.). The Utah-based survey captured the energy views and attitudes of rural and urban Extension agents within the state. The nationwide and Utah-based surveys, coupled with nationwide focus group interviews, offer new breadth and depth to the examination of renewable energy's role in Extension.

National Extension Energy Summit Expanded Results and Implications

Attendees of the National Extension Energy Summit were surveyed because of their existing involvement with energy related programs in Extension. According to the sample of 38 Extension respondents, 61% were male and 39% were female, with birth years ranging from 1945 to 1988. The majority of respondents (94%) had obtained graduate degrees, and 37% of respondents had "energy" included in their job title. Respondents represented eighteen states, with a slight majority (52%) reaching more than 200 clientele in annual face-to-face renewable energy programmatic efforts.

The majority of respondents targeted rural and urban individuals in their renewable energy programmatic efforts (See Table 4-1). Thirty-one respondents completed the question, with the option to select multiple targeted groups.

Table 4-1.
Extension Employees' Targeted Renewable Energy Clientele

Targeted Group	Frequency	Percent (%)
Farmers	18	58.06
Ranchers	10	32.26
Homeowners	20	64.52
4-H	12	38.71
Rural individuals	24	77.42
Urban individuals	20	64.52
Government entities/policy makers	20	64.52
Private companies	13	41.94

The focus on individuals, rather than larger entities or organizations, indicates that respondents favor community-based renewable energy efforts. In terms of complexity, community-based efforts offer a pragmatic approach that is proven to be effective in bringing about behavior change (McKenzie-Mohr, 2011).

Survey respondents indicated that 38% of their clientele's core values and beliefs would make them less likely to transition to renewable energy sources. Although a minority, this reveals that nearly forty-percent of clientele's barriers are socio-political. In addition to socio-political barriers, respondents deemed "lack of financial resources" and "lack of understanding of technology" as two of the top barriers in clientele's transitioning to renewable energy sources.

This survey was exploratory in nature, and results were used to craft the talking points for focus group interviews at the National Extension Sustainability Summit. Key survey implications incorporated into the focus group interviews included: (1) the predominance of Extension professionals' focus on distributed (i.e., localized) renewable energy projects rather than utility-scale projects; (2) the proper way to message

renewable energy programmatic efforts in spite of significant core values and beliefs that are at odds with the technology; and (3) the role of education in relation to perceived financial and knowledge barriers in clientele's transitioning to renewable energy systems.

National Extension Sustainability Summit
Expanded Results and Implications

Focus group interviews ranging from 45 minutes to one hour were conducted at the National Extension Sustainability Summit. Five facilitators led guided discussions with 26 Summit attendees that volunteered to participate. Participants represented each U.S. census region and offered insights on Extension's role in renewable energy programming, and effective delivery methods of renewable energy information. Attendees were chosen because of their involvement in Extension sustainable living programs, many of which had expertise in sustainable energy.

Interview participants discussed electric utilities fifteen times, with several mentions of partnerships but a majority of references to utilities' lack of interest in partnering with Extension. Participants felt that Extension's messaging of renewable energy efforts should exclude climate change for socio-political reasons. Additionally, multiple interviewees felt that renewable energy messages needed to have an appeal to rural and urban clientele.

The National Extension Energy Summit survey results showed that Extension professional's identified knowledge and understanding of renewable energy systems as a primary barrier for clientele. When this theme was explored in the focus group interviews, lacking renewable energy knowledge of participants was evident, despite their

involvement in Extension sustainable living and energy programs. The price of gasoline was mentioned 26 times when interviewees were asked what would motivate clientele to seek information about renewable energy sources. Interviewees also indicated that the rising price of gasoline would be the key driver in clientele transitioning to renewable energy systems. However, the disconnect is demonstrated by petroleum oil providing 92% of U.S. energy used for transportation, but only 1% of the energy used to generate electricity (Energy Information Administration, 2015).

Focus group participants alluded to the need for more renewable energy programming in Extension nineteen times. There were also multiple mentions of the need for Extension to stay true to its reputation of providing unbiased information to the public, meaning that renewable energy programs needed to be fact based and avoid controversy. The findings from the two Summit's provided an idea of where Extension employees' attitudes toward renewable energy stood on a national scale. The final phase of this project explored the renewable energy attitudes, barriers, and needs of Utah State University (USU) Extension employees.

Utah State University Extension Survey
Expanded Results and Implications

All USU Extension employees were eligible to participate in an online survey for the purpose of gaining a broad understanding of renewable energy attitudes among different locales and areas of expertise. According to the sample of 194 USU Extension respondents, 36% were male and 64% were female. The majority (33.3%) of respondents were between 55-64 years old, and 57% possessed a graduate degree. Extension faculty

represented 48% of survey respondents, with Extension staff at 47%, and Extension administration filling out the remaining 5% of respondents. More than 90% of respondents believed that 50% or less of U.S. electric energy supply would be provided by renewable resources by 2024. Additionally, 38% percent of respondents agreed or strongly agreed that Utah is lagging behind other states in renewable energy development.

Once again, the cost of renewable energy systems was overwhelmingly cited as the principal barrier to clientele renewable energy decisions. The complex process of transitioning to renewable systems was the next most prevalent barrier, which has direct implications to public knowledge and education of renewable energy systems. Almost 80% of respondents indicated that their office offered no renewable energy programs to the public or didn't know if programs were offered. This indicates that while some renewable energy education is occurring in USU Extension, such curriculum has not been formalized or centralized.

Respondents voiced a need for renewable energy information, outreach, education, and programming within USU Extension (See Tables 4-2 and 4-4). More than 50% of respondents agreed or strongly agreed that renewable energy trainings would enhance their Extension outreach efforts (See Table 4-3). Additionally, there was a majority of agreement that USU Extension renewable energy programs were in demand internally and from the public.

Table 4-2.
USU Extension Respondents' Responses to "To what extent do you agree or disagree that there is an internal demand (USU Extension faculty) to receive renewable energy information?"

Response	Frequency	Percent (%)
Disagree/Strongly disagree	16	9
Neutral	50	29
Agree/Strongly agree	84	49
Don't know	21	12
Total	171	100

Table 4-3.
USU Extension Respondents' Responses to "To what extent do you agree or disagree that there is a public demand for USU Extension to provide public renewable energy information, programs, and outreach?"

Response	Frequency	Percent (%)
Disagree/Strongly disagree	14	8
Neutral	56	32
Agree/Strongly agree	87	50
Don't know	16	9
Total	173	100

Table 4-4.
USU Extension Respondents' Responses to "To what extent do you agree or disagree that there is a need for a Renewable Energy Specialist in USU Extension?"

Response	Frequency	Percent (%)
Disagree/Strongly disagree	19	11
Neutral	45	26
Agree/Strongly agree	92	53
Don't know	16	9
Total	172	100

USU Extension respondents were asked to rank which tools would be most useful for communicating renewable energy information to the public. The question received 172 total responses, and participants were given a 7-point Likert agreement scale for each communication tool. The tools receiving the most agree and strongly agree responses

include: (1) an energy website maintained by USU Extension (n=139); (2) fact sheets (n=134); (3) in-person workshops (n=118); (4) a state specialist to refer to (n=110); and (5) a cell phone application (n=91).

When asked to provide open-ended input on USU Extension's energy future and outreach needs, respondents indicated a need for renewable energy involvement:

- "My husband and I have talked about using renewable energy ourselves and love the idea, but we worry about the upfront costs, understanding codes, etc. Having someone in our extension that could provide such information would be wonderful!"
- "I believe this is a good direction for Extension to put some of its resources."
- "I think it is a needed subject that is increasing in importance."
- "Renewable energy information and technologies are growing rapidly in demand. Without a state specialist and an energy-focused program in our state, we will inevitably lag behind as an entity and be seen as outdated."
- "Providing 4-H curricula, information, [and] support on this topic would be helpful so that we can work on influencing/educating the future generation."
- "I would love to know more about solar power myself and how to install it as cheap as possible and would love to have more information about it."
- "USU Extension is a well-recognized and functional tool with which essential and trustworthy information about this important topic could be shared."
- "USU Extension needs to get ahead of the game on this. Utah residents want to do the right things to improve energy efficiency in the state. In particular, if the

energy efficiency/renewable energy topics are addressed in relation to air quality, I believe Utah residents will be receptive."

- "If we were to have a State Specialist for Renewable Energy, I think they would be best stationed at the Utah House at the Utah State University Botanical Center."
- "It is a great idea, however our agents are already being spread so thin with all that is required of them. If a new specialist was to be brought in that would be a different story."
- "Counties with active renewable energy projects should be targeted to lead and participate."
- "I feel that Utahn's, in general, need to be more aware of sustainable, environmentally friendly (as much as energy can be) ways to get energy. "
- "The need for renewable energy over the next century is clear. What expertise do we have on USU's campus about renewable energy? Is USU positioned to have the resources to be an information source / research center to the community?"

Survey respondents cited "credible sources of energy information" and "renewable energy incentives and rebates" as the energy topics Utahns are least informed about. The results indicate that there is a need for a renewable energy specialist that should first address barriers (i.e., cost of renewable energy systems and complex process of transitioning to renewable energy systems) and knowledge gaps (i.e., credible sources of energy information and renewable energy incentives and rebates) through the most effective programming (i.e., energy website, fact sheets, and in-person workshops).

Conclusions and Recommendations

As a result of this research, it is clear that there is a growing interest and need for renewable energy programs in Extension nationwide and within USU Extension. The following conclusions and recommendations apply to Extension nationwide:

1. There is a need for increased energy programming in Extension.
    - Extension's relevancy may be solidified through the delineation of energy programs.
2. Extension's history of providing unbiased, research-based information must remain central to renewable energy programming and outreach efforts.
    - Extension's connection to rural audiences offers a unique opportunity to break through politically divisive energy attitudes.
3. Extension needs to form partnerships with outside existing energy entities to best serve the public.
    - This will ensure that Extension's renewable energy offerings are unique and useful for clientele.
4. Cost is the principal driver and barrier in Extension clientele's renewable energy decisions.
    - Extension may serve as an information broker that offers clientele honest evaluations of the transition costs to renewable energy systems.

The following conclusions and recommendations apply to USU Extension:

1. Energy attitudes differ across the state.

- This indicates that renewable energy programs must be properly messaged to rural counties rich in fossil resources.

2. USU Extension employees are supportive of receiving renewable energy information.
    - Extension Sustainability and the Utah Biomass Resources Group serve as natural information brokers relating to renewable energy.
3. USU Extension employees have indicated that there is a public demand from their clientele for renewable energy information, programs, and outreach.
    - The three most preferred methods of renewable energy information delivery are web resources, fact sheets, and in-person workshops.
4. USU Extension employees have indicated a need for a renewable energy specialist.
    - The need for a renewable energy specialist was agreed upon by 59% of survey respondents, as well as 67.5% of respondents deeming a specialist as the preferred method of renewable energy information delivery.

With more than 970 megawatts of planned renewable energy projects by the end of 2016, Utah is positioned to be home to an emerging renewable energy market, and USU Extension has a role to play (Energy Strategies, 2015). Many USU Extension county offices are home to a vast rural land area in which renewable energy development presents a high value use. As a nation, all renewable energy sources (except for hydroelectric power) increased in production in 2014 (Energy Information Administration, 2015). This growth points toward a nationwide opportunity for Extension

programming. This thesis recommends Extension to assist in the development of the nation's profound renewable energy resources for the benefit of communities, electrical customers, and the environment.

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APPENDICES

APPENDIX A

NATIONAL EXTENSION ENERGY INVENTORY

Alabama Cooperative Extension System

Alabama Cooperative Extension System provides a Specialist with an emphasis in renewable fuels, three eXtension courses with certificates of completion, a fact sheet, and a website dedicated to renewable energy information. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Alaska Fairbanks Cooperative Extension Service

The University of Alaska Fairbanks Extension Service provides an Energy Specialist, publications, webinars, and podcasts that discuss renewable energy topics. There is a distinct Energy and Housing department that provides renewable energy outreach, education, and programs.

University of Arizona College of Agriculture and Life Sciences Cooperative Extension

The University of Arizona's College of Agriculture and Life Sciences (CALS) Cooperative Extension (CE) employs an Area Agent in Community Resource Development that devotes a portion of time to renewable energy projects. Arizona Extension provides clientele with a statewide Renewable Energy Opportunity Analysis (REOA). REOA is a geospatial suitability study that examines the feasibility of utility-scale solar development projects. In 2014, an Arizona Energy Master program was implemented, based on Colorado State University's existing program. The program is a 7 module course offered to the public that teaches participants about Arizona's energy portfolio, the energy climate change nexus, home energy efficiency, how to conduct

energy audits, and the basics of distributed renewable energy. There is not a centralized or distinct renewable energy department, program, or discipline area in CALS-CE.

University of Arkansas Division of Agriculture Research and Extension

The University of Arkansas Extension provides a website with information on renewable energy that is linked within the Environment and Nature department's webpage. The Business and Communities department offers information and publications on renewable energy policy. A seasonal publication, *Energizing Arkansas,* provides information on renewable energy in collaboration with the Arkansas Energy Office. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of California Division of Agriculture and Natural Resources Cooperative Extension

The University of California Extension is home to a Woody Biomass Utilization Group within the Division of Agriculture and Natural Resources. There are blog entries about renewable energy technologies through the California Naturalist program. There is not a centralized or distinct renewable energy department, program, or discipline area.

Colorado State University Extension

Colorado State University (CSU) Extension has a dedicated Energy Specialist who coordinates a 30-hour Colorado Energy Master certification and develops and delivers energy resources and programming across the state. CSU Extension provides a

webpage, workshops, webinars, curriculum and training for middle and high school teachers, online decision tools, community energy assessments, and more than 20 energy publications with a focus on renewable energy technologies and energy efficiency. CSU hosted the inaugural National Extension Energy Summit from April 29 to May 1, 2013.

University of Connecticut College of Agriculture, Health and Natural Resources Extension

The University of Connecticut Extension offers tours of farms that have installed solar photovoltaic (PV) panels and anaerobic digesters. The Integrated Pest Management Program website offers information on federal and state renewable energy tax incentives, and a Farm Energy Conference was hosted in 2013 with the Connecticut Department of Agriculture and the Department of Energy and Environmental Protection. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Delaware College of Agriculture and Natural Resources Cooperative Extension

The University of Delaware Extension offers information on bioenergy through the Delaware State Energy and Climate Change Office's Clean State Program. There is not a centralized or distinct renewable energy department, program, or discipline area.

Florida Cooperative Extension Service

The University of Florida and Florida A&M University Extension offer information on alternative energy within the Environment and Sustainable Living departments. An Extension sponsored television show, *Living Green,* hosts a website that

provides detailed information on all renewable energy sources. Some county offices offer trainings on the production of biofuels. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Georgia Cooperative Extension

The University of Georgia (UGA) Extension has a bioenergy website linked under the Environment program. UGA Extension offers bioenergy research programs, publications, 4-H youth programs, and hosts the Southeast Bioenergy Conference. The Camden County office developed the Georgia Florida Renewable Energy Expo, which offers information on renewable energy technologies to the public. Additionally, Extension faculty offer farm efficiency audits throughout the state. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Hawai'i at Manoa College of
Tropical Agriculture and Human Resources
Cooperative Extension Service

The University of Hawai'i does not have a centralized or distinct renewable energy department, program, or discipline area because of funding constraints.

University of Idaho Extension

The University of Idaho's Farm and Ranch Management department provides a publication on anaerobic digesters through their Farm Structures and Machinery program. The University's Department of Biological and Agricultural Engineering administers a Biodiesel Education Program that offers renewable energy curriculum for youth in

conjunction with the 4-H program. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Illinois Extension

The University of Illinois at Urbana-Champaign has an Energy program with publications on ethanol, presentations on wind power, and information on grant opportunities. Illinois Extension also works closely with the College of Agriculture, Consumer and Environmental Sciences' Integrated Bioprocessing Research Laboratory, which focuses on the commercialization of biofuel technologies.

Purdue Extension

Within the Agriculture and Environment departments, Purdue Extension has an Energy program with two staff, one of which is a Renewable Energy Extension Specialist. The Energy program provides more than 80 publications on wind energy, solar energy, bioenergy, on-farm efficiency, biofuel co-products, and residential energy efficiency. The program focuses on the advancement of biofuels, wind power, and anaerobic digestion in rural Indiana and beyond. In addition to offering publications, Purdue Extension also hosts workshops on renewable energy.

Iowa State University Extension and Outreach

There is information on renewable energy within the Ag Decision Maker, an agricultural economics and business website linked within Iowa State University's (ISU) Extension homepage. The program provides publications, profitability analyses, energy conversion tools, and newsletters focused on ethanol and biodiesel. Similar information is

also provided through the Agricultural Marketing Resource Center, an initiative funded through the United States Department of Agriculture and ISU Extension. ISU Extension also hosted the 2014 Extension Energy and Environment Summit from September 23-26, which focused on bio-renewables and sustainability.

Kansas State Research and Extension

Kansas State University (KSU) Extension provides external renewable energy links on their Energy Conservation and Renewable Energy webpage, which is housed within the Engineering Extension program. KSU Extension does not have an energy specialist, and offers no certificates or face-to-face trainings. The Community Development program provides information on the viability of wood resources in Kansas. There is not a centralized or distinct renewable energy department, program, or discipline area.

Kentucky Cooperative Extension Service

Kentucky Extension delivers energy audit programs and commercial and residential energy information in collaboration with the University of Kentucky Department of Biosystems and Agricultural Engineering. There is not a centralized or distinct renewable energy department, program, or discipline area.

Louisiana Cooperative Extension Service

The Louisiana State University (LSU) AgCenter offers extensive information and outreach on bioenergy programs to agricultural producers. Researchers collaboratively study and evaluate the feasibility of commercial scale biofuel projects. The Louisiana

Institute for Biofuels and Bioprocessing, housed within the LSU AgCenter, was established in 2009 to give Louisiana support in planning and decision making by emerging biofuels and bioprocessing industries. The Sustainable Bioproducts Initiative (SUBI) provides a website, fact sheets, and presentations from specialists. The AgCenter also hosts the LaHouse Home and Landscape Resource Center, which offers information and publications about residential distributed renewable energy systems.

University of Maine Cooperative Extension

Maine Extension has an Energy program that provides information on alternative energy sources for the farm and home. The program provides fact sheets and a three part webinar series, one of which is focused on alternative energy system assessment tools. The Energy program also provides external links with information on renewable energy systems, as well as additional home efficiency and energy savings materials.

University of Maryland Extension

University of Maryland Extension (UME) has several faculty members who devote time to wood energy. UME provides publications, outreach, and information on woody biomass energy for residential and commercial applications and actively partners with other organizations for shared interests. Additionally, some county offices provide information on federal and local grant and loan opportunities relating to renewable energy technologies. There is not a centralized or distinct renewable energy department, program, or discipline area.

The University of Massachusetts Extension

The University of Massachusetts Extension's Environmental and Water Conservation program provides information on incorporating renewable energy technologies into building designs. Research publications on biofuels are also available online. There is not a centralized or distinct renewable energy department, program, or discipline area.

Michigan State University Extension

Michigan State University Extension (MSUE) has a very active energy focus within the Greening Michigan Institute (Community and Natural Resources program areas) and Agriculture and Agribusiness Institute, in addition to research efforts underway within Michigan State University's (MSU) AgBioResearch agriculture experiment station. Frequent news publications on all types of renewable energy sources are posted online by Extension faculty. The MSUE Wind Power program loans anemometers and provides information on land contracts, zoning, and citing in relation to wind energy development. MSU's Land Policy Institute runs a Renewable Energy Policy program, which provides science-based renewable energy information to interested stakeholders. The Bioeconomy program includes research and education on biofuels and the MSU Anaerobic Digestion Research and Education Center. Additionally, the 4-H Youth Development program is hosting a five-day camp on renewable energy for youth ages 13-19 from July 6-10, 2015.

University of Minnesota Extension

Minnesota Extension provides information on renewable energy in several departments. Renewable energy economic analyses and software tools are available through the Agricultural Business Management program. The Environment department has an Energy Efficiency and Renewable Energy webpage with publications on all types of renewable energy systems. Clean energy is one of four focal areas of the Regional Sustainable Development Partnerships (RSDP) program, with more than 10 employees making up the Clean Energy Resource Teams (CERTs). The CERTs are a part of the Minnesota Extension program. CERTs work via seven regional teams that span Minnesota. These teams are made up of a diverse mix of people: individuals, small business owners, farmers, local utility representatives, members of environmental groups, educators, and local government representatives. Each team is guided by a local Steering Committee that sets regional priorities, identifies emerging energy issues and opportunities, and directs grant funding.

Mississippi State University Extension Service

Mississippi State University Extension provides publications and fact sheets on bioenergy products. Additionally, the Farm Management department offers information on energy conservation. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Missouri Extension

The University of Missouri Extension has an Energy program with five Natural Resource Engineers and eight Housing and Environmental Design Specialists who execute the programming. The Energy program website is linked with the E^3A initiative. The E^3A publications and fact sheets on renewable energy technologies have been tailored to provide Missouri specific information. Additionally, Extension staff offer tours of campus power plants that are powered with biofuels.

Montana State University Extension

Montana State University (MSU) Extension has an Energy program that provides county level information on wind energy opportunities and issues. The E^3A initiative was developed at MSU, yet the founder has since left her position. E^3A provides renewable energy fact sheets, presentation materials, educator forums, and online tools for Extension professionals.

University of Nebraska-Lincoln Extension

The University of Nebraska-Lincoln Extension provides information on renewable energy within the Bioenergy program. Outreach efforts are focused on bioenergy, the utilization of feed co-products from ethanol production, and cropping systems that supply and support the bio-energy industry. There are publications, seminars, videos, and face-to-face trainings on renewable energy systems provided by Extension experts. An Extension Educator, with a background in biological systems engineering, oversees the program.

University of Nevada Cooperative Extension

The University of Nevada Extension provides fact sheets on renewable energy resources. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of New Hampshire Cooperative Extension

The University of New Hampshire (UNH) Extension provides information on the state's renewable energy rebates. UNH Extension offers a significant amount of information on residential energy efficiency within the Natural Resources department. There is not a centralized or distinct renewable energy department, program, or discipline area.

Rutgers University New Jersey Agricultural Experiment Station Cooperative Extension

The Rutgers University's New Jersey Agricultural Experiment Station (NJAES) and Rutgers Cooperative Extension (RCE) programs have a Sustainable Energy Working Group (SEWG) that coordinates and communicates research and outreach activities at NJAES and RCE relating to bioenergy with involvement from various governmental agencies and organizations involved in agriculture energy. The program offers assessments of biomass energy potential, event and funding notices, and external energy links. An Extension Specialist in Agriculture Energy provides leadership to the group.

New Mexico State University Cooperative Extension Service

New Mexico State University (NMSU) Extension has an Energy and Water program that oversees the Windmill Technology Center (WTC). The WTC helps preserve the legacy of wind-millers through training in windmill erection, repair, and wellhead protection. NMSU Extension also offers more than 15 videos on renewable energy systems for homeowners. There is not a centralized or distinct renewable energy department, program, or discipline area.

Cornell University Cooperative Extension

Cornell Cooperative Extension (CCE) has an active Energy and Climate Change program. CCE promotes local production and use of fuel and energy where feasible. The program's focal areas include: energy efficiency and conservation, renewable energy, community energy planning, climate change mitigation and adaptation, and natural gas. Target audiences include agriculture, landowners, homeowners, and communities.

North Carolina Cooperative Extension

North Carolina Cooperative Extension at North Carolina State University has a residential energy education program (E-Conservation) that provides information and resources on reducing energy use and improving energy efficiency in the home. The Extension Forestry program provides research, publications, and videos on woody biomass. There is not a centralized or distinct renewable energy department, program, or discipline area.

The Ohio State University Extension

The Ohio State University Extension (OSUE) is home to the Energize Ohio program. A field specialist, with an emphasis in energy development, oversees the program. Energize Ohio provides renewable energy bulletins, fact sheets, videos, webinars, and an incentive database. A customizable energy curriculum is also provided for Extension educators. The program is one of OSUE's Signature Programs. It is considered to be a cornerstone of the university's strategic plan.

Oklahoma Cooperative Extension Service

The Oklahoma Cooperative Extension Service (OCES) provides fact sheets on renewable energy technologies and leasing considerations. OCES works closely with the Biobased Products and Energy Center (BPEC). BPEC aims to enhance bioconversion technologies and provide education to a broad audience through extension and outreach. There is not a centralized or distinct renewable energy department, program, or discipline area.

Oregon State University Extension Service

Oregon State University (OSU) Extension and the College of Forestry collaboratively formed the Oregon Wood Innovation Center (OWIC). The OWIC offers information and publications related to biomass and biofuels. There is not a centralized or distinct renewable energy department, program, or discipline area.

Penn State Extension

The Penn State Extension Natural Resources and Energy program provides renewable energy programs, publications, and outreach. The Extension educators in the energy program evaluate energy alternatives, educate stakeholders on alternative energy issues, and leverage their program through partnerships. Penn State Extension also offers the Renewable Energy Academy course. The course is a series of three hour programs that discuss renewable energy system installation, operation, regulatory considerations, and system economics. An Extension educator with an emphasis in energy savings and renewable energy oversees the wind and solar power outreach.

Rhode Island Agricultural Cooperative Extension

The University of Rhode Island (URI) Outreach Center, an arm of Rhode Island Cooperative Extension, hosts educators with varied expertise in energy benchmarking, policy-making, and adult education to mentor graduate and undergraduate students and develop and implement energy education programs. In 2014, URI Outreach Center staff and undergraduate students, known as Energy Fellows, held URI's first Renewable Energy School, a full-day workshop designed to inform home and small business owners about available renewable energy technologies and associated policies, programs, and financial incentives. The Center also hosted the URI's first Home Energy School, which focused on energy conservation behavior and energy efficiency implementation in partnership with the state utility.

South Carolina Cooperative Extension

Clemson University's Sustainable Agriculture Program received grant funding to train South Carolina Extension agents in renewable energy systems. There is not a centralized or distinct renewable energy department, program, or discipline area.

South Dakota State University Extension

South Dakota State University Extension does not have a centralized or distinct renewable energy department, program, or discipline area.

University of Tennessee Extension

The University of Tennessee (UT) Extension coordinates an Extension Energy Education Working Group with several other state partners including Tennessee State University (TSU), Tennessee Solar Conversion and Storage using Outreach, Research and Education (TN-SCORE), and the Tennessee Department of Environment and Conservation (TDEC). UT Extension personnel include specialists from Family and Consumer Sciences, Agriculture and Natural Resources, and 4-H Youth Development, making this working group a multidisciplinary initiative, reaching to all clientele across the State of Tennessee. Extension Specialists provide youth development training and support to County 4-H Agents in STEM/energy lessons for K-12 youth; STEM education for Tennessee youth; energy conservation, efficiency, and renewable energy workshops to homeowners, renters, farmers, and business owners across the State; and training and resources to County Extension Agents within conservation, efficiency, and renewable technologies.

Texas A&M AgriLife Extension

Texas A&M AgriLife Extension does not have a centralized or distinct renewable energy department, program, or discipline area.

Utah State University Extension

USU Extension houses an Extension Sustainability program that offers information, programming, and outreach in the areas of land, water, air, food, and energy. Renewable energy publications, external videos, external lesson plans, and sustainability related funding opportunities are available online. USU Extension also offer the Utah House. The Utah House is a demonstration site that provides information on solar photovoltaic energy and other energy efficiency practices. The Center for Agronomic and Woody Biofuels provides publications, videos, and programs focused on woody biomass. USU Extension does not have a centralized or distinct renewable energy department, program, or discipline area.

The University of Vermont Extension

The University of Vermont Extension has an Environment and Natural Resources program that provides information and external links on renewable energy. In 2006, the Center for Sustainable Agriculture completed a research project examining the cost-effectiveness of on-farm renewable energy resources. There is not a centralized or distinct renewable energy department, program, or discipline area.

Virginia Cooperative Extension

Virginia Cooperative Extension (VCE) provides clientele with an *Energy Resource Guide for Virginia*. The *Guide* was developed in partnership with the state energy office and several electric cooperatives. It provides households, farms, businesses, and schools with energy information, tools, and publications. An Extension Specialist in Community Viability oversees the program. Additionally, an Area Specialist in Agri-based Bi-Product Utilization conducts renewable energy assessments and offers technical information on anaerobic digestion and biodiesel conversion. The Area Specialist also assists farmers with energy audits and hosts workshops on renewable energy technologies.

Washington State University Extension

Washington State University (WSU) Extension is home to the Extension Energy program. The program provides renewable energy information to industry, businesses, organizations, government agencies, utilities, and individuals. Energy specialists design and evaluate renewable energy systems, in addition to providing technical assistance to clientele. The second National Energy Extension Summit will be held at WSU in the spring of 2015.

West Virginia Extension Service

West Virginia University (WVU) Extension jointly supports the Appalachian Hardwood Center (AHC). The AHC provides information and resources on wood energy. WVU Extension also provides expertise on oil and natural gas. The 4-H and Youth

Development program offers out-of-school programs that discuss renewable energy and biofuels. There is not a centralized or distinct renewable energy department, program, or discipline area.

University of Wisconsin-Extension

The University of Wisconsin-Extension provides a website with information on renewable energy for agricultural enterprises. Additionally, the Extension Responds Energy website provides external links with national and statewide renewable energy resources. A Senior Outreach Specialist manages the Rural Energy Program. The Specialist's duties include developing audit tools, educational materials, and making presentations primarily focused on energy conservation. Wisconsin-Extension also hosts the online Energy Independence, Bioenergy Generation and Environmental Sustainability Training Center. The Center is a modular course series focused on the technical feasibility of bioenergy generation.

University of Wyoming Extension

The University of Wyoming (UW) Extension, in partnership with the UW School of Energy Resources, delivers the Renewable and Efficient Wyoming program. The program provides renewable energy and energy efficiency publications, videos, workshops, trainings, and information on incentives in Wyoming. An Extension Energy Coordinator oversees the program. The Coordinator helped develop the E^3A materials and curriculum.

APPENDIX B

NATIONAL EXTENSION ENERGY SUMMIT SURVEY INSTRUMENT

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

We are conducting research to better understand Cooperative Extension's communication of renewable energy programmatic efforts.

Please help us by completing this survey. Your responses will remain confidential. Participation is entirely voluntary. You may refuse to participate or withdraw at any time without consequence. The survey will take approximately 10-15 minutes to complete.

If you have any questions or concerns about your rights and would like to contact someone other than the researchers, you may contact the IRB Administrator at (435) 797-0567 or email irb@usu.edu; refer to IRB protocol #5161. Feel free to contact Roslynn Brain or Blake Thomas for further study information.

Thank you for your time and assistance.

Respectfully,

Blake Thomas
Graduate Research Assistant
Utah State University Extension Sustainability
blake.thomas@aggiemail.usu.edu

Roslynn Brain
Sustainable Communities Extension Specialist
Utah State University Extension Sustainability
roslynn.brain@usu.edu

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

Background

Before you complete this questionnaire, please read this paragraph clarifying renewable energy:

"Unlike fossil fuels, which are exhaustible, renewable energy sources regenerate and can be sustained indefinitely. Renewable energy sources include biomass (including: wood and wood waste, municipal solid waste, landfill gas and biogas, ethanol, biodiesel), water (hydropower), geothermal, wind, and solar" (EIA, 2012). Natural gas is not a renewable energy source.

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

Background

This section will help assess your involvement with Cooperative Extension and renewable energy programmatic efforts.

***1. Do you currently work for Cooperative Extension?**

- [ ] Yes
- [ ] No

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EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

2. In what state are you employed?

State: -- select state --

3. What is your current job title?

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EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

4. What is your level of agreement with the following statement: Renewable energy outreach and education is viewed as an important programmatic area among fellow employees in my county office/department.

Strongly disagree				Strongly agree
○	○	○	○	○

5. Are you currently administering any programs or information about renewable energy?

- ☐ Yes
- ☐ No

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EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

6. What is your level of agreement with the following statement: Fostering environmentally sustainable behavior with my clientele is important to me.

Strongly disagree				Strongly agree
○	○	○	○	○

7. How familiar are you with the concept of peak oil?

Not At All Familiar				Extremely Familiar
○	○	○	○	○

8. How familiar are you with the concept of energy return on investment (EROI)?

Not At All Familiar				Extremely Familiar
○	○	○	○	○

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

Clientele

This section will assess the role of Cooperative Extension's clientele in renewable energy programmatic efforts.

9. On average, how many clientele do you reach in face-to-face renewable energy programmatic efforts per year? (If none, leave blank)

- ○ 1-40
- ○ 41-80
- ○ 81-120
- ○ 121-160
- ○ 161-200
- ○ 200+

10. Who are you targeting in your renewable energy programmatic efforts? (Check all that apply)

- ☐ Farmers
- ☐ Ranchers
- ☐ Homeowners
- ☐ 4-H
- ☐ Rural individuals
- ☐ Urban individuals
- ☐ Government entities and/or policy makers
- ☐ Private companies

Other (please specify)

11. What age groups are you targeting in your renewable energy programmatic efforts? (Check all that apply)

- ☐ Youth (1-12)
- ☐ Teenage (13-19)
- ☐ Adult (20-64)
- ☐ Senior (65+)

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EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

12. How concerned are the majority of your clientele about the natural environment?

Not At All Concerned				Extremely Concerned
○	○	○	○	○

13. How concerned are the majority of your clientele about the CURRENT cost and availability of fossil fuels?

Not At All Concerned				Extremely Concerned
○	○	○	○	○

14. How concerned are the majority of your clientele about the FUTURE (in 5 years) cost and availability of fossil fuels?

Not At All Concerned				Extremely Concerned
○	○	○	○	○

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

Please indicate your level of agreement with the following statements:

15. The majority of my clientele are open to the idea of renewable energy as an alternative energy source.

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

16. In teaching about renewable energy, I feel my approach connects well with my clientele.

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

17. I receive more positive than negative feedback regarding the renewable energy outreach materials and training I have delivered.

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

18. I find it difficult to effectively communicate about renewable energy to my clientele.

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

19. Please rank the barriers (1-5) your clientele have in transitioning to renewable energy sources (1 being the top/biggest barrier).

Opposed to renewable energy	
Lack of understanding of technology	
Lack of access to the technology	
Lack of financial resources	
Lack of renewable energy sources (e.g., lack of adequate sunlight or wind)	

20. Any additional barriers you wish to identify?

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

21. In general, my clientele are politically: (Check all that apply)

- ☐ Conservative
- ☐ Moderate
- ☐ Liberal
- ☐ Don't know

Other (please specify)

22. In general, my clientele's core values and beliefs:

- ○ Make them MORE likely to transition to renewable energy sources
- ○ Make them LESS likely to transition to renewable energy sources

Other (please specify)

23. What is your level of agreement with the following statement: I adapt my communication about renewable energy to match my clientele's specific values.

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

24. Do you feel you are currently missing any key audiences that you would like to reach in the future regarding your renewable energy programmatic efforts? If so, please explain:

UtahStateUniversity
EXTENSION SUSTAINABILITY

Cooperative Extension's Communication of Renewable Energy

Background

This final section asks a few general questions about you.

25. What year were you born?

26. Gender:

- Male
- Female

27. What is the highest level of education you have attained?

- Some high school or less
- High school graduate or GED
- 2 year degree such as a technical college or community college
- College Bachelor's (4 year) degree
- Graduate degree (Master's or Ph.D.)

28. Comments:

Thank you for your time and participation.

APPENDIX C

NATIONAL EXTENSION SUSTAINABILITY SUMMIT INTERVIEW PROTOCOL AND FOCUS GROUP TRANSCRIPTIONS

Interview Protocol: Extension professionals
Project Description: Renewable energy needs assessment

Introduction:

- *Introduce yourself as the facilitator.*
- *Thank participants for their time.*
- *This focus group is the guiding the framework for a renewable energy program within Extension.*
- *This research is part of a thesis, and is a follow up to a survey distributed to attendees of the National Extension Energy Summit last May.*
- *Any questions can be directed to Blake Thomas or Roslynn Brain about IRB approval and confidentiality. They are both at today's conference.*
- *Participants identification will be kept confidential and they may opt out at any time.*

Questions:

Section I: Background

1. What state and university are each of you from?

2. How long have you been involved with Extension?

3. What are your roles?

4. Does your state's Extension service offer renewable energy outreach?

    a. If yes, what does that outreach look like? (Comprehensive renewable energy program? Offer fact sheets? Guide interested clients to online resources/in-person contacts)
    b. Is this also offered at the county level?

5. Is renewable energy outreach and education viewed as important area among fellow employees in your county office/department?
6. Do you foresee an increased emphasis placed on energy education in the future? What leads you to this perception?

Section II: Extension's role in energy programming

1. What do you perceive Extension has to offer in energy programming, given the role of public utilities/electric cooperatives, the United States Department of Agriculture, the United States Department of Energy, and state energy offices?
2. What would it take to motivate people to learn about renewable energy?

a. Peak oil?
b. Declining fossil fuel energy return on energy investment?
c. Current cost of fossil fuels?
d. Future cost of fossil fuels?
e. Climate change?
f. Interest in renewable energy technologies?
g. Autonomous characteristics of renewable energy (i.e., local, oftentimes independent from utilities)
h. Environmental ethics
i. Other?

Section III: Perception of renewable energy in Extension

1. Which messages should be avoided?

2. Please explain the current level of interest your clientele have in energy.

3. What are the primary barriers clientele have in transitioning to renewable energy sources? What leads you to these perceptions?

4. Does your county have roots in fossil fuels, natural gas, or nuclear energy production? Could this be causing renewable energy to be perceived as a threat among clientele?

5. What groups should be targeted for renewable energy programmatic efforts?

6. When marketing renewable energy technologies, should there be a difference in presentation to those that are urban versus rural?

7. When marketing renewable energy technologies, should there be a difference in presentation to those that are youth (8-19), adult (20-35, 35-50, 50-65), and senior (65+)?

8. How can renewable energy programmatic efforts connect to Extension's traditional audiences? (e.g. agriculture, community building)

Section IV: Delivery of renewable energy programs in Extension

1. What would an ideal renewable energy Extension outreach program look like?

Energy Focus Group #1
Extension Sustainability Summit – Newpark Resort – Park City, UT
Wednesday, October 2, 2013 (49 minutes)

T: I'm [Name withheld], and like I said, I'm at Utah State. I'm a graduate student for [Name withheld]. We put out a survey to energy educators in Extension, and we got back the results; there are about 40 people or so that took it and it's really interesting to kind of see their attitudes and perceptions of their clientele and their willingness to accept renewable technologies or not. And that survey had some really interesting kind of results as far as a little bit contradictory at times, and so these questions here are going to kind of elaborate on the results we got from our survey. So basically this will be the guiding framework for a renewable energy program in Utah. Colorado has one in place, and then Milt [Geiger] at Wyoming with Sarah Hamlen in Montana, they both have the E^3A initiative and are kind of the leaders, at least in the West, that I'm aware of and some people in New Mexico and so I'd love to hear about other activity in energy in Extension, as you know that. But what we're going to do is go ahead and start things off with just what's your name, what's your state or entity that you're representing, and what's your role there. So we'll start here?

K: My name is [Name withheld]. I'm in the department of Agricultural and Applied Economics at the University of Wyoming. So I have a partial Extensions appointment and I work on water resource economics.

O: My name's [Name withheld], but I'm just here as an observer.

B: I'm [Name withheld] with the University of Nevada Cooperative Extension. I'm a little bit of a newbie, just started the position in the last year and just fine tuning my program's appearance and I'm interested in community development.

T: Cool, that's great.

J: I'm [Name withheld] with the Utah State University Botanical Center. I'm the Utah House coordinator, which is the green building demonstration.

M: My name's [Name withheld], and I'm also at the USU Botanical Center. I primarily work with education programs.

R: I'm [Name withheld] at the University of Wisconsin-Extension. I'm county-based, in northeast Wisconsin, and I've been doing sustainability education along with economic development education, community based.

P: [Name withheld], Washington State University. I'm a regional Extension specialist and educator, and by regional, I work in Washington, Oregon, Northern Idaho, and Northern California on a biofuels project.

T: Cool. Thanks, guys. So to start things off, what I wanted to get into is just to ask about your state's Extension services. It's okay if you don't know about it. But, what is offered in renewable energy? So for example, is there a comprehensive program in energy, are there fact sheets, or a guide to interested clientele to go online to research more? Is there anything like that happening within your states that you're aware of?

B: I am so new that I really don't know. I'm more interested in knowing!

T: Yeah, that's okay.

P: There's lots of energy related things in Washington. It's not necessarily well coordinated, um, there's an energy institute that's part of the Extension but it's like it's own separate entity because it has historically existed and then when the funding ran out it got funds that it became a Washington State University thing. So there's a lot, but it's not well organized.

T: Okay, that's good to know. Is renewable energy outreach and education viewed as an important area for those who work in Extension among your colleagues? Is that kind of an important issue for them, or is it more on the back burner?

P: I'd say it's a mixed bag. You have some people who are very supportive of those topics and want to see programs developed, and then you have- even within Extension- other people who really are a little uninformed and not very, not very…supportive.

K: Supportive- that's a good word. [Laughter]

T: Mm-hmm, yeah.

K: Certainly in Wyoming we have, you know we have Milt for an answer because he's obviously fabulous, so I don't know to what extent the county Extension educators take his programming and are building workshops as we've got to get the word out. [Change of thought] I know that, working on water, the number one question people have for me out of the state is "How can I lower my pumping costs?" So um, it's not [Pause] really a concern about minerals that fits your question, it's really more, "How can I keep things going for another year?"

T: Yeah, exactly. Cool, thank you.

R: I'd say within my community development, uh, group- and we have a large group, we have over 15 county-based community development educators- there's a premium put on this. Outside of that, it's less. It becomes sporadic across the programming.

T: Mm-hm, yeah. [Pause] So do you foresee an increased emphasis placed on energy education in the future? And what leads you to that perception, within your respective counties or states?

P: In Washington, I would say yes. In, um- part of the reason is that we've been fortunate to get a lot of federal funding coming our way. And then recently, just a month ago, we got another a- [Slight pause] aviation…energy and environment sustainability institute. There's been a lot of spotlight on our state for various reasons. So there's that, and then there's also an aviation biofuels working group.

T: Okay.

P: So there just seems to be a lot of interest at various levels in the state.

T: Funding helps.

P: Funding helps, yes! Funding helps. So we've been fortunate recently and it would be nice for the state to recognize that, to keep the momentum going at a state level and it seems like Extensions should be, and continue to be involved.

T: Yeah, absolutely. Any thoughts?

K: I'm going to say that in Wyoming we have lots of coal and we have lots of wind. And that, um, I would imagine that as there are policy changes at the national level I expect there will be, somehow, the favoring of one type of energy over another. That's going to have a huge impact on Wyoming's state economy.

T: Right.

K: So in the future I would expect that people on the ground, and in energy education, everybody to be asking more questions about it.

T: Yeah, absolutely. Cool, thanks guys. So this question- the next one kind of overlaps a little bit with the session Milt had. But what I was curious as far as what your perceptions were about what Extension has to offer in terms of renewable energy, given the role of public utilities, electric cooperatives, the USDA, the Department of Energy's state energy offices. What do you perceive the role or niche is of Extension in the renewable energy sector/field?

M: I think it's about localizing all of that other information. Your demographic, your audience, is going to change pretty drastically depending on where you are. It could even change drastically within your state. So, with an Extension presence in individual counties and individual communities, it seems- it seems pretty logical to me to use that as a way to focus all of that information and to tell you audience, to tell your- uh, not clients- your people how they can apply that to their own lives, whether it's personally in their homes, whether it's in their schools or their businesses. Um, it's just-

T: Yeah, absolutely.

M: -Making sense of a deal.

T: Yeah, I feel like Utah- you have a great example in Utah, where Cache County to Salt Lake County, to, you know, San Juan- I mean it's just such a wide region, political affiliation, demographic, it's just- and resources that are available. So that's a good point.

R: I would add that uh, I think one of the things we do really well is convene and facilitate discussions, research-based. We need to bring in information, as a group of stakeholders needs that. But I've been dabbling in negotiation and can start getting parties around many things, but I can see this would possibly be something we could bring to the table is helping stakeholders learn how to represent themselves without killing each other.

T: Uh-huh.

R: And, you know, maybe the win-win would be getting to "yes;" it's a book very successfully followed. But maybe using some of those ideas and creating new terrain and you know, searching for options that meet criteria and that type of thing. And then it really puts it on a- more of a, um, an equal footing for all the shareholders? And then they feel empowered and they feel like they can talk.

T: Yeah.

R: And, uh, or whatever tool we use, not just getting a "yes," but something where they actually, you know, start to get to the nitty-gritty and think "Okay, this is what I need for that project to be acceptable in this community." And this party's saying, "this is what I need," and-

T: Mm-hm. So do you feel like in your experience that Extension will be able to kind of be like a moderator, this unbiased source that has community trust that can kind of help, um-

R: Depending on the source, yes-

T: -integrate science and values?

R: Mm-hm; depending on the strength of our brand in each state-

T: Uh-huh.

R: We could, we could be that: neutral. We're trusted as one who doesn't have an agenda when we come to a community discussion.

T: Right, yeah I think that's agreeable.

R: Mostly agreeable, mostly.

T: Yeah. Any other thoughts about that?

J: Just the- just kind of saying that I think he's really right because a discussion of renewable energy in like, here in Utah in Carbon County- there's a reason why it's called Carbon County, the mecca, the coal mecca of the state- is going to be a completely different conversation than maybe what we have in Cache Valley or Salt Lake. I mean, yeah. Or here. Or someplace else. [Laughter]

T: So I want to know what you think it would take to motivate people to learn about renewable energy. That's a really broad question; there are some kind of sub-prompts I want to introduce to it. I'm just curious; I want to extract your ideas about what will get people to move from thought to action in regards to renewable energy initiatives or advocacy, whatever the degree it is for them. Just some talking points to throw out there are the concept of peak oil, that potentially we've reached our peak, which kind of goes into a decline on fossil fuel energy return on investment. So it's like a dwindling resource; our prices are increasing. Is it possibly the current cost of fossil fuels, the future cost? Climate change? We talked about that in the last session. Is that an appropriate vehicle coming from Extension? Um, just the general interest in the technology? The

kind of self-governing nature of renewable, where it's local, it's independent, which could kind of draw on the Conservative values. Environmental ethics? Maybe none of those? Anything different? What are your thoughts on what it would to motivate people to learn about energy, to kind of get that through to think about energy?

K: I think cost.

J: I was just going to say, money-

K: Money.

J: -is always a driving…

T: Yeah.

B: And practicality. I know in Nevada, you know we have this wonderful, powerful sun everyday beating down on us and I'm thinking, "Why aren't there more people interested in solar panels? I really don't know that much about it, but the technology is too expensive right now? It could be more, um, consumer friendly? I don't know the answer.

J: So I think because of that, Extension's role would be really valuable. As far as my position at the Utah House, I have people coming in all the time interested in doing these things. They want to, whether it's for environmental-ethical reasons that are moving them or whatever, and they want to know where they can go, what kind of things are out there as far federal and state rebates and what are the programs are out there that they could take advantage of. And so I think more and more…you know, for sure where I'm located, the job for us is to make sure we have that current information and research and stuff to give them.

R: The answer to your question changes depending on the scale of the energy system you're looking at. At household level, obviously, money is going to drive both the savings part but also how much more can we afford to put in to having a 96% efficient, natural gas furnace in the house? That costs five to seven thousand bucks. And then, with these bigger, regional-type projects that you were talking about, the aggregating, the wood projects, I think there's more than just costs that become the drivers. I think also that the federal mandates about water quality and other things start to drive them.

T: Yeah, I think those are great points.

M: I think finding- we kind of talked about this in our last- what's that called- lightning wrap, but having something that piques their interest [is important]. If we have all of the information and nobody wants access to it, then it's pretty useless. So finding something like the bike that gets some students or anybody interested is really important to getting them to want to access the information.

J: I think that's touching on the technology. Because for a long time our washers and dryers have remained the same for years and years and years, and then all of a sudden because of federal mandates to change things for environmental reasons, now all of a sudden they've kind of redesigned all these washing machines and they're high tech now. And so people are willing to pay a lot more money for a front loader than they would for the standard because of the new technologies. So I think technology is one of the motivating factors you're talking about.

T: Yeah, absolutely. [Pause] Any other thoughts about that? [Pause] Yeah, I think that Extension has an interesting position that we're in to be able to be this unbiased source of

information that can come gather information or intelligence that the general public needs to just kind of have that interest. But I feel like it can almost be crippling sometimes to think about actually transitioning and making a change because of the complexity and just understanding, "Well, what are the rebates? What do I do with the utilities?" Things like that. I think there is definitely great opportunity there. [Change of thought] In your opinion, what are your perceptions of messages that should be avoided? So what I mean is, should Extension not have a really strong voice as far as climate change as a motivator or driving factor, or should, you know, if you see your energy return on investment declining, like, are there any messages that in your opinion would really sting or maybe draw people away?

K: Certainly I was thinking about climate change as you were talking before you mentioned it because we were saying Extension has a reputation for being research-based and there are a lot of- [Pause, change of thought] Climate scientists generally believe or agree on the fact that climate change is happening and it's human induced and so that is the resource based message.

T: Right.

K: But we turn people off when we talk about that too.

T: Yeah. That's why I think it's such a peculiar one for Extension because there is a preponderance of evidence in regards to climate change. There aren't any dissenting scientific organizations on a large scale, and so that is the unbiased research to take from the university and put out to the public. But, because it is so political in nature, it's kind of been tossed around as a little threatening to the rural, Conservative Wyoming person

who makes their living off fossil fuel sources. Any other thoughts about messages that should be avoided or that would be something to avoid in communicating renewable energy?

J: I think a lot of it has to do with language, because you know you can present things a lot of different ways. That's what we were talking about in our last group.

Yeah.

J: You can talk about climate change without threatening people. And you know, just talking about how the climate's always changing and how can we use it to our advantage or whatever, or what's coming down the road, what changes do we need to make.

M: It's education versus advocacy. If we're presenting scientifically based information and having the person that is receiving that information really understand it, that's education. If we're telling them why they should do this because it's a good thing and we have to save the earth, we fall in a language that's used. We could probably reach the same goal both ways depending on who you're talking to but making sure that you're using the right deliverance is important.

T: Any other thoughts?

R: I think we could talk about sustainability but maybe… [Pause] um find a better way to call it, a better something to call it. Because I'm not sure- I just hear the word being used all the time: "an organization's sustainability," or, you know, or, "the Congress is not taking a sustainable approach to the budget," and I think it's starting to get watered down. I don't know. I like "resilience." You could talk about that at the family level. You could talk about that at the community, the state, the region. But now we have to start all

over with the message again. I'm not sure where to go with it. Sustainability is not- that term is not resonating with the average person on the street. Not yet. Maybe it will.

T: Yeah, I think it's an interesting issue just because of what's attached to the word. What is sustainability? Is that riding your bike? Or is that having solar panels on your roof? I think that that makes it difficult to rally behind the cause. And I feel like there's a lot of interjectory ecological where everything is "eco." Eco-model, eco this or that. Now everything is the sustainable taxicab for the sustainability- whatever it may be.

R: By the way there was a focus process some years ago that found the preferred term about energy is not renewables, it's not alternative, it's "clean energy."

T: Clean energy-

R: It's what resonated with most Americans.

T: Yeah, yeah.

R: Maybe we missed the boat.

T: At Utah State we have a center for clean energy technology.

R: Oh you do?

T: Yeah, so, they're housed in the Business School and they're very careful about that presentation.

R: Mm. [Laughter]

K: In Wyoming, we have "clean coal!" [Laughter]

T: That was interesting during the presidential debates, the clean coal topic. Okay, so what are the primary barriers clientele have in transitioning to renewable energy sources? And what leads you to these perceptions? And so we've kind of hit on some as far as

cost. Are there any other glaring barriers that can get in the way of a person transitioning to renewable energy technologies?

J: The infrastructure of cities, for one. We don't have a lot of the, you know…some, some are harder than others to implement in cities and some are impossible to. So, I think that's a huge barrier. And you know, renewables- we're learning a lot about them but we still need to integrate them with other back-up systems and things like that. I just think that those are some other barriers.

R: I think there are legislative and regulatory barriers. Even done to the local level where zoning ordinances and building codes say, "you can't do this." The big debate about people wanting to put pole-mounted solar panels in their backyard in a suburban community outside of Appleton, in northeast Wisconsin, is that my gosh…[chuckling]

T: Yeah, wind has a lot of issues with technology in the backyard…

M: I think having some cohesiveness between the different infrastructures would- is a pretty significant obstacle as well, or the lack of cohesiveness. So if you've got a great public transportation infrastructure but the local businesses, or depending on what the economy looks like and if their whole population isn't on board with that…there are different ways that this alternative energy can be used within that infrastructure. And if there's no cohesiveness between those things, between the government and the private entities, things like that, it's going to break down. Having a public-private partnership and having all of those different interest groups kind of obviously makes it something to be constructive with.

J: Probably an oversimplified example is our [Utah State University's] Platinum-Leaf building. They did not provide a parking lot for it, which is how we got some green points. But there's no way to get to the building through any sort of public transport. You have to walk or ride a bike.

R: You may have violated the federal accessibility guidelines through Extension.

[Laughter]

J: Yes!

M: I read a really interesting thing; I think it was the Department of Energy that ranked the top 50 most populous cities in the United States based on their energy consumption. They looked at five different areas and one of them was access to public transportation; one of them was business practices. I forget what the five things were now, but Boston was the top most efficient place. And then you had areas like San Francisco and New York where over half of the population doesn't drive to work. They're using some of what they've implemented, versus a city like Indianapolis where 5% of the population doesn't drive to work. So it was just seeing all of the different facets that kind of go into that. If one thing's out of place: you have this really cool building but you can't get to it so it doesn't matter.

T: Any other thoughts on barriers?

P: Just concern over the new technology. Is it going to work like it's supposed to? If I run into a problem, am I going to be able to get assistance in a timely manner? Can you fix whatever new- whatever it is?

T: Yeah, especially like- I work in the solar industry so it's just like everybody wants to wait one more year or let the technology get better, sturdier, cheaper. So that's an issue.

M: Is it an issue even before you get to that point of, okay I want to do this but who do I call?

T: Other than Ghost Busters? It's Extensions! [Laughter]

R: Ghost Busters! [More laughter]

T: And that's what I think too, is just from a general, typical, public person is like, "How do I even begin to attack this? It's just so many different entities." That's where I think a lot of opportunity lies for Extension to be the middle person that's gathering all of the intelligence and information out there and help make it palatable for just the typical homeowner or landowner, rancher.

R: We have master gardeners. We have master root preservers. Have you got those programs out west? We have a master composter training program. What if we had a master energy…guide kind of program?

T: Well that's what this thesis is about!

R: Really?

T: Yes!

R: Well, my gosh! There, I just supported your thesis for you! You can reference me. [Laughter] But I- we actually had one guy who, he was an engineer with Al Shelverns out in Milwaukee and he lost his job and he was 70 years old. And he said, "I want to do something! Don't put me out to pasture." [So we said] How would you like to be an energy volunteer? He goes to the county fair and he teaches; he's having a blast. If I had

the time- if I were a state specialist and not county-based, I would take this and make it into a statewide program. That's an excellent tool. People are going to look at that and think, "That's way cool."

M: Sounds like you are looking at it!

T: Yeah, so kind of the purpose of this thesis is that Colorado has a Colorado energy Masters program. And so the guy who runs that carries in close touch with Milt [Geiger] and Sarah [Hamlin] in Montana. I've talked to them a lot. I mean, it's hard in the sense of keeping people going and volunteering after the fact and having an ongoing relationship with those who are involved so it's still kind of experimenting. It was heavily classroom based and now they're having more of an online presence just because of people and availability and location. So there is that model in Colorado. The E3A initiative that Milt [Geiger] talked about is kind of a "teach the teachers." So that's energy education for energy- I mean for Extension- professionals. So what I'm looking at is a Utah renewable energy Masters program and the feasibility in the state of Utah in the sense of how are you marketing, communicating, and framing your messaging to Utahans, who are particular example where it's less- it's a Conservative state but um, very, very conservative places like Carbon County with historical roots in fossil fuel extraction. I'm looking at the human side of how do you communicate these technologies, being unbiased but speaking to your audience.

R: I'm sorry if you announced that at the beginning-

T: No, no that's fine!

R: -if that's why we're doing the- but I always miss the first few minutes. [Laughter]

T: Oh that's okay, that's fine. Um-

P: In Washington we have a group, we don't have it statewide, but we have sustainability stewards. They do things like go into low-income housing and change light bulbs for people and are very active doing community projects.

T: So this; I'd just like to have everybody to contribute on this one. Does your county have roots in fossil fuels, natural gas, or nuclear energy production? So is there a traditional energy source? Could this be causing renewable energy to be perceived as a threat among your community or clientele? So how about we start here and work around.

M: I already mentioned coal and there's some tension there. [Pause] What else did I talk about?

T: Oh, I was just curious what the roots are and do you think that would be a threat. Like renewable energy would be perceived as a threat by the community.

K: Yeah I know so, in Wyoming- and I guess this is no surprise- wind is going to thrive in places where it's financially a good idea for the landowner. We're not going to worry about what coal down the road brings them to-

T: Cool. So that's interesting; you haven't really seen much conflict there, like get that wind out of here, or-

K: Oh yes, yes, absolutely. So not specifically coal but definitely the landowners over here where they can't put in wind but they can still see that wind is clear view, it's definitely a, definitely an issue.

T: Yeah, okay; gotcha.

B: Hmm okay, I was thinking we don't have any renewable energy but we have a first-of-its-kind in the country in Tonopah with this solar reserve energy [Tonopah Solar Reserve]. So that's kind of exciting, it's been two years under construction. This December, we hope to have it in operation. That's kind of exciting.

K: "Solar reserve"?

B: Yeah.

O: It's a solar collector, versus solar panels. Here, it's focused on a collector that converts electrical energy. You hook it to the grid, transmit it.

T: Gotcha.

K: I've seen that in the movies! [Laughter]

B: Yeah, so I guess maybe we do have something out in Nevada!

T: Is there, in your opinion, in the county or town that you work in, is there a history at all of fossil fuels? Is that kind of a threatening type of technology to say, "Hey, what is this solar business doing here? We're rooted in natural gas or we're rooted in-"

B: Well there're two contrasting communities. One is the mountain town of Tonopah, population of 2000, and then there's Pahrump, which has an identity kind of crisis thing. They think they're still rural but they're about 36,000 [population]. And they're scratching their head, like why didn't we get that solar energy project? You know, but Tonopah got it.

T: Interesting, so there's competition. That's a thought!

O: Really they don't use fossil fuels because it's- everything's based on electric. There's no natural gas, no coal. Everything comes from either the Hoover Dam or the grid in California and now there's this huge solar reserve. It's a big project.

T: Yeah, is that going to stay in state, or?

O: Well, it's pretty close to the border with California so I'm sure they'll see some of it.

T: I'm sure California would like that. And the Utahans…?

K: For you, probably no.

M: We're in Davis County-

K: Where's Davis County?

J: It's just 10 minutes north of Salt Lake, maybe 15 minutes.

M: There's a big presence of coal, obviously. That's probably- and I have heard back lashings over a few of the bigger wind projects, especially down by, um, some town-

T: Spanish Fork?

M: Yeah, Spanish Fork. Of just- I don't know about land owners but community members and the general public thinking that it's like an eye sore.

T: So that is a really interesting study. There's a professor at Utah State whose name is Ed Stafford, and he and a group filmed the process of putting in this wind farm in Central Utah. When the project started, there was tons of resistance. Really conservative historical fossil fuel town and county. And so they were marketing it as the fact that, well there's really poor air quality in that area of Utah. So they were saying this is going to help clean up the air, this is going to help with air quality issues. Nobody cared, and that was just still despised. So then what they did was go back and rewrote their message

frame strategy and they said, oh the tax money from this is going to help pay for your kids' school. So then it became wind power will help pay for your kids' school. And just the momentum, it was night and day just from going from "I don't care about clearing the air, and you know, breathing well," but all of a sudden there's this message with the family and the kids holding hands. Wind power's going to pay for school. And it went through. And it's there and it's a successful little plot. So that's just kind of one of those fascinating studies of message framing and communication. So how about here with your Wisconsin-?

R: Well, Wisconsin is 96% dependent on other states for fuel sources: coal, uranium, and natural gas. We have nothing. We have wind and we have solar and we have hydro that are digits. But what we do have is mining for minerals. There's a huge controversy right now in northern Wisconsin and they're going to try to teach about sustainability because, Natural Step, for example, talks about reducing the amount of mining. It would be a conflict. But I don't have the same experience except for growing up in Pennsylvania and knowing now that if I tried to go into the little coal towns where I was born, and luckily we moved away, and tried to teach about how we needed to adopt renewables, the only way I could do that is to talk about an investment in the future. Just like with the children. I think that future message- because these are non-renewables that we're dependent on- but the future is part of the present dollar savings. Somehow combine those two messages and we can overcome, I think, the barrier of being in a fossil fuel rich state. Eventually, the future is not going to be fossil fuels. How far in the future? I don't know.

T: Right. I think it's interesting. I've thought a lot about the frontward definition of sustainability, which comes from 1987, and it's the future generation mission that everyone has heard. I think that it's interesting because it is difficult to say, well what are future generations going to need? How am I going to know what the landscape, energy-scape is going to look like at that time. This makes it a really difficult task to take on. And then you think, okay, I'll know what they'll need, and also there's this place where the top keeps spinning and I've reached this equilibrium of sustainable development. "This is what it is," and I think that that makes this definition hard to crystalize because of the ambiguous nature of potential scenarios and then also the fact that you can develop the present sustainability matters but how do you know you've reached this pinnacle?

J: I think that's why that one project worked so well- the wind project because it wasn't like this vague future. It was like, this is your children, right now, that you have their school, their education, and people can see that, "Oh, I want that." And if you talk generations ahead, then it's a little harder.

R: But that school's going to last 30 years. So the next generation of parents is going to value it.

J: Exactly, exactly.

T: I think it's so fascinating that they don't care about the air that they're breathing!

J: I know! "Eh, I don't care!"

T: That's huge!

R: Could I just add one thing about a positive message? I've had this discussion with three knots of people today. Especially at the household level, stop talking about

expenses in local government. This isn't an expense to purchase small-scale wind or solar: this is an investment. And now the whole frame of mind is changing because we put it on a business basis. That's a tool right from the business segment. Your return on investment: if it doesn't show it, you don't do it. If it shows it, it makes sense to people, even if it takes 20 years for it to pan out.

T: Well that's a great example for how important the words that you're using and choose. If something's an investment versus an expense, people are much more accepting of that. There is this connotation of getting a return on investment. Thanks, that's a great point. Alright, so let's see; we have Washington!

P: Oh, Washington! Yeah, Washington is a big hydro state.

T: Is Washington 100% hydro?

P: Not 100%, but it's big in hydro. It's big in hydro, it's big in water. It has some nuclear. One of the reasons the grants came in, that I work on, and the other project is because we don't have fossil fuel resources, we don't have common resources. So that is actually a benefit in promoting renewable energy infrastructure.

T: Yeah, yeah great. [Pause] So this will probably be our last question; we're about out of time. I was just wondering, in your opinions, the question is: what group should be targeted for renewable energy programmatic efforts? So what I'm getting at is, should there be a difference in your marketing to those that are urban versus rural? Should there be a difference in youth, like 8-19, 20-25, 26- you know, senior, 65 plus? Is that the right thing to do? Would that cause trouble? Is there a particular group that seems most prime to be accepting of this technology?

K: I guess what you're asking is, let's say you do a survey to find out that 25-35 year olds are the most likely to adopt this. Do you focus on them because you can talk about something cool that you can send to everybody? Because that's the mission of Extension, to reach everybody.

T: Yeah, or do you just focus on that group? Because it's like, well this is the most opportunity, or should I focus on all the other groups even more so because these ones are going, or this group is going to find this technology. I think it's an interesting issue as far as where you allocate your time and resources.

R: How long-term is your funding?

T: Well, I have a year.

R: If it's a two year [Laughter]- You need a short term win. Right away.

O: You have to focus on the people that have the most available income to invest in an urban setting because it has the most seen [visible] change in an investment. You can see the return faster because they use more energy.

M: I think part of your question was about marketing. You need to change your marketing. You're going to reach very different audiences depending on the kind of marketing that you use, especially if you divide it into age groups like that. Outlets like social media are absolutely going to reach a target audience of-

T: 12-13?

M: Yeah, if you're tweeting about why this, that, and the other is cool, eventually someone is- well, obviously if you're not the nerdy person tweeting about wind power, but anyway-

T: It's different brands, age groups.

M: It depends on your marketing

T: We need Justin Bieber to tweet renewable energy!

M: Yes! See? That would work! The way that you communicate, there are some communities that a public forum is still very effective. An urban environment may not be the place for that. Depending on what part of your Extension audience you're looking for, you absolutely have to change your marketing.

T: Some people are kind of in the mindset that that's going to come back and bite you if you're catering or tailoring a new message to different groups or demographics.

R: I have a question. Do you, do we- you didn't mention any kind- do we have a moral obligation in Extension to try to help lower-income groups? We're already doing poverty-based education and so forth. Is that a place to start? To show a group that not only really needs this but when they adopt it, the returns are immediate. They start spending the extra cash they have on things they need. But, on the other hand, they don't have the money to make the investment. It's a question of capacity versus obligation to help the less fortunate.

T: That's a great question.

R: You can get so much done. I don't know what percent of people or households in Utah are below the poverty level.

T: Well I know it definitely varies throughout the state. In the southeastern part of the state it drops a lot, as far as people below that line. Central is higher. I don't know those exact figures but that's an interesting question though as far as where do you put your

focus. I think it's interesting to look historically, as far as who in history, especially in the U.S., have been drivers of change in the sense like, is it going to be the rich or is it going to be the poor that are the ones that push us into a change. A lot of people think well the rich have the means, the ways and means, but they're also the ones who are going to be able to afford gasoline when it's $6 a gallon. So throughout time when you look at going from wood to coal or other energy shifts, it's usually the low income, the poor, that are the drivers of change because they can't afford the energy source at all. And so it's like, well, we need to have the ability to move. I'm interested to see what direction that takes in the future as far as, are the people on the lower end of the totem pole in income going to be the drivers, moving along big energy change, or not.

M: I expecting that you were going to say exactly the reverse, because when you look at people who are buying Priuses right now, they have a lot of disposable income, and they're bringing down the price of the precedence. In that case, adoption is from the other end of the spectrum.

T: Yeah. I read this article about that last year. It was just so different from everything I'd always thought! Yeah. It's interesting. Well, I know we're supposed to wrap up at 4:30. Thanks so much for having the attention span to power through this focus group that I know was thrilling and dynamic.

R: I enjoyed this!

T: I just appreciate- this is really helpful. I am under [Name withheld] and her information is out here at this conference. If you guys want to follow up with me about the results, basically I'm going to be taking these five interviews, listening and just

extracting qualitative patterns, so like here's the thing about mining and coupling that with the survey and gathering that qualitative data. That's kind of the first half of the field of research. Thanks so much guys! I appreciate it.

Energy Focus Group #2
Extension Sustainability Summit – Newpark Resort – Park City, UT
Wednesday, October 2, 2013 (62 minutes)

B: Alright, so my name's [Name withheld].

R: What was your name again?

B: [Name withheld].

R: Where are you from?

B: I'm from Logan, Utah. I work for [Name withheld] as an Extension intern, and I'm just helping [Name withheld] with this project of his. So thank you for your willingness to answer some questions. This is part of his thesis, so this will largely go into his Masters thesis. He did say it's all confidential, so just speak your opinion. It won't be- your name won't be published. It's just for some thesis research. So if you guys could all talk about what state and university you're each from and how long you've been involved with Extension, as well as maybe what some of your roles are. That's the first thing I'm supposed to ask. So maybe we can start right here?

R: Say it again?

B: Just right here, so your name, what university you're from.

R: Okay, my name: I'm [Name withheld], University of Wyoming. I've been involved in Extension for um, since 1997 in Wyoming and then probably another 10 years in Idaho. Right now I'm an Extension specialist in development.

A: I'm [Name withheld] from the University of Idaho in the department of Landscape Architecture. I've been involved in Extension for about five years or so. And I help teach studios; I'm currently working on the Narrow Project with U of I and WSU, which is Northwest Renewables.

K: [Name withheld], assistant director of the Center for Civic Engagement and Service Learning, and I am involved with service learning and the Student Sustainability Office.

G: I'm [Name withheld], and when I started college at the University of Florida my intent was to be a county agent, and when I finished, there were not many jobs available. In fact, it was a horrible job market in 1959. So my major pro-, one of my professors said, well, get a Master's degree and you'll be ahead of the game when you get a county agent job. Well, I did that, there were no jobs available. He said, well, no problem; get a PhD and you can be an Extension specialist! So I took all of the Extension courses at undergraduate. Went to Iowa State to get a PhD in weed science, took all of the graduate courses in Extension programs, and still couldn't get a job in Extension! But I got a job in research, but I finally did land a job in Extension as the director of Georgia Extension Service, when became dean and director. So I have had one job in Extension, and that is director.

B: Alright, so the first question he would like is: does your state's Extension service offer renewable energy outreach? If so, what does that outreach look like? So is it a comprehensive renewable energy program? Does it have fact sheets? Does it guide interested clients to online resources or in-person contacts? And also, if it does, is this offered at the county level?

R: Well, from a- in Wyoming actually we do, and Milt Geiger is actually the guy you ought to talk to because he's the person that does it. [chuckles] But yeah, I think he does all those kinds of things.

A: I'm not really sure. I think probably only one person in the region has sort of that information and they're mostly associated with research projects rather than local communities, kind of do their own thing.

K: Pass.

G: Well, I've got something I've got to say. I've already talked with one Extension person here. When I became under secretary in 2006, the hot item was energy, as you all recall. You all recall in 2006. During my confirmation hearing, all of the questions were directed upon my position on agriculture and being involved in energy. After I became under secretary, I hired a former vice president of Extension from Iowa named Stan Johnson just to help me work on Extension's role on energy in the future. One of the things that we talked about and envisioned was Extension doing exactly what you said. That is, taking the lead in all aspects of energy. And it's been so gratifying to hear some of the presentations here today and the question you just asked, I'm just absolutely tickled to death to see that. For god sakes, continue. Don't do what we did in the last time we had an energy problem. As soon as Ronald Reagan went into the White House, we tore down the panels that Jimmy Carter had put up and everything else and there were no more oil embargos so we went back to the same way we were doing before. Even though we have fracking now and all that sort of thing, we haven't changed the dynamic of energy at all. We have changed the timetable, but the energy that we build our

civilization on is a finite resource. We have no choice but to be looking at alternatives, and now's the time to do it. Not when we have to. So Extension- if anybody's going to take the lead, it's Extension. And what you're doing- and that question is a good one- for god sakes don't stop.

B: Very good. So he wants me to ask, is renewable energy outreach and education viewed as important, an important area among fellow employees in your county office or department? So do you feel like the people that you work with view this as an important issue, this outreach into energy?

R: At the university level, the people I work with, yes, they do.

A: I'd agree at the university level. I think the individual Extension agents have position descriptions and very often find themselves in areas where they see themselves as more traditional [agriculture] advisors or economic advisors or nutritionists, and they don't bring energy into the mix.

K: Repeat the question.

B: So do you feel like the employees you work along side with, with Extension, do you feel like energy outreach and teaching about energy is something that's important to them?

K: I can't speak to Extension. Some of these I'm just going to opt out of because I'm not directly involved with Extension.

B: That's just fine.

K: But I would say that within my community of peers at the university, within service learning, yes. It is a priority.

G: I think it's a priority, but it's no question. We've lost some of the enthusiasm of 2005, 2006, and 2007, and 2008. Certainly the ads on TV, if you see the beautiful young lady that says, "What does our energy future look like? Very bright!" I mean, the gas industry is trying to convince us that we have nothing to worry about now and forever into the future. We don't have that luxury. We have to be concerned about this whole planet for the future, the next hundred years, five hundred years, thousand years, shouldn't we? But who's going to do it if we don't? It's certainly not going to be industry. It's certainly not going to be politicians. Who does that leave? That leaves us! We have a crucial, critical role to play in energy, and you guys are doing it.

B: Very good. So the added on part of that question was, do you foresee an increased emphasis placed on energy education in the future? What leads you in this perception?

R: Well in my case, in Wyoming, sure. Yeah, it's become more important. It's the biggest industry in the state, but our focus a lot of times in Extension has to do with how to adjust to impacts of energy development rather than energy alternatives. But yeah.

A: I think it extends well beyond Extension. I think it- all of the academic programs are focusing on energy as a priority. In my area, in the College of Art and Architecture, architecture has set its own goals about creating technology and designs to reduce and [increase] energy reduction in heating of homes and buildings and things like that. And the landscape architecture department is involved in this Narrow Project, which of course is biomass, and our students never thought about that ten years ago. I think we're immersed in it now.

K: Um [Pause] say the question again?

B: Do you foresee an increased emphasis placed on energy education in the future? And if you do, what leads you to that conclusion?

K: Mm-hmm. [Pause] Yes, [Laughs]. Yeah, no I do think there will- out of necessity, like you were saying, there will be an increased emphasis on energy education.

G: I certainly agree with what you said. I would add that we need to be a bit more creative in how we do that. For example, at the campus where I am- I'm on University of Georgia's Tipton campus. The main campus, of course, is in Athens, where the football team is. But I'm down in the south where the research is. The local trade school and the University of Georgia Experiment Station teamed up to build a zero-energy house with the county education program. They built it and now they're trying to sell it to make money for the education foundation in the community. I was told that it looks like it's going to be a, not only a zero energy, it might even come out a little bit ahead, by building it to all the specifications and that sort of thing. It's created a lot of buzz, a lot of interest. And also on the research side, they're building a future farmstead-type house, in which they are looking at how to build a farmstead that is zero energy. And these kind of things are much more important than just giving speeches and talking. When you actually build things folks can see. So I think we've got to be more creative in how we provide education.

B: Alright, the second question kind of states, what do you perceive Extension has to offer in energy programming, given the role of public utilities, electric cooperatives, USDA, DOE, and state energy offices? So, if Extension did take on this role of energy,

having an energy outreach, what would Extension have to offer over these other entities trying to do the same thing?

B: Well, I suppose one could be sort of looking at community level impacts of energy use as well as development. Extension, a lot of times, can view it [energy use] as an objective or an unbiased, um, not all the time, um, player. So we can use that, use them for that or economic impact, environmental impact analysis. We are probably the only ones in the state, in our state, that are doing anything on the reclamation of disturbed lands as a result of energy development. And the energy industries as well as the communities look to that center for information on how you actually reclaim disturbed land. So at the impact side or exposed side of energy development, we're doing that sort of thing.

A: Yeah, I kind of agree with that. I think that a great opportunity for Extension is that they know what the local situation is. So they could come up with energy systems that are calibrated to local assets that national energy companies are going to ignore and that they can make things work at the community scale where they might not work at the regional scale or the national scale.

B: Okay.

K: My perception is that Extension offers unbiased, research-based information, verses if the education is coming from Sierra Club or an organization with more of an environmental or corporate profit agenda.

G: Clearly, I agree with the points that you made- that Extension provides an unbiased opinion on issues that are based on sound research. But more important than that, Extension doesn't have an axe to grind in the case. If you look at, and I just talked about

a few minutes ago, the ads from the energy forces, there's plenty of those ads. At least Boon Pickens has gone off the air. Old Boon used to- and I have great respect for Mr. Pickens, but you know, he was saying things that were honestly not true. You can't argue with the fact that fossil fuel is finite. And what does finite mean? It doesn't take a genius to answer that question. Of course, I had one person argue with me that said that oil is being made down in the middle of the earth. So you've got all kinds of things. But the other thing is, if Extension doesn't do it, who is going to do it? Who is going to lead this effort? And that's what a said a while age, there's no one else to lead this effort. Now we dropped the ball in 1974. When Reagan came in, everybody quit. ARS terminated, they had a big lab down in Tipton where I was; they terminated that program, ARS completely got out of the energy business. The University [of Georgia] did the same thing. We can't afford that, to let that happen now. Energy has got to be an integral part to the future of Extension. I'm convinced of it.

B: Very good. Um, also attached to this: what do you think it would take to motivate people to learn about renewable energy? So messages about peak oil, declining fossil fuel energy, the return on investment? Or energy return on energy investment, pulling oil out of the ground? Things like current fossil fuel costs, future cost of fossil fuel, climate change? How do you feel about- like, what avenues would you choose to focus on to get people interested in renewable energy, in a renewable energy program offered through Extension?

B: Well, some of the, some of the [indiscernible conversation] is well, "you don't have to depend upon the man," right? [Laughter] But, uh, I think a lot of times people are very

interested in what are the alternatives and how do you build those alternatives into the grid, into the energy grid now? So they're interested in that I think and local level, home level stuff, and then work your way up to a bigger neighborhood and then the community. I think you can do it, but in our case, you have to be careful about how you frame it.

A: I think it has to be framed really, first of all, as a quality of life issue. How do you improve the lives of your family and of your community? How can you decrease the risk to your community and yourself and your kids in the future? You know, then I think you can start talking about renewables, versus something else, you know, even climate change then. I think you first have to start at, "what is the real impact in the home," first of all. You know, why are you paying $300 a month to heat a home when there are alternatives around that. And then, what are some of the spinoff problems associated with the things you might choose.

K: I'd just like to add, I guess, a little bit to that. That tying it into health and the health of your children, you know, we want clean air to breathe. And so that's certainly one thing that all people can relate to regardless of their political persuasion. And- what else was I going to say- fossil fuel, the cost of gas. Of course if that increases, I mean we saw that when the cost of gas increased, suddenly there were more fuel-efficient vehicles on the market and more hybrids and more alternatives suddenly became available because people were demanding that.

G: You got my answer!

K: Oh yeah?

G: Because I was going to say that the one thing to make the story is six-dollar gas.

K: Yeah, absolutely!

G: And I have a question: I can remember, you guys can't, y'all are too young. But I remember you could buy gasoline for fifteen-nine. Fifteen cents. Fifteen and nine-tenths cent a gallon. [Various subdued exclamations]

A: I could do 25! [Laughter]

G: Well that's because you're young. But I can remember it 15.9 cent a gallon. I can still remember buying it for my old car in Jamesville, Florida. I was an undergraduate student. And I still remember- my wife and I were talking about [this], we made a trip; we were driving through Mississippi (I can't remember what year) and we saw gasoline at 43.9. And we said, "We are not going to pay that, we will see if we can't make it to Alabama!" [Laugher] And now we don't bat an eye; of course, gasoline is $3.15 in Georgia now. I noticed you guys are paying $3.62. But the breaking point, apparently, looks like is $4 a gallon. People don't grumble till they get $4. But I think once it starts approaching $4, people start really getting concerned. But I think that's the one that's the one thing that really makes a difference, is the cost. Of course, electric bills; my wife likes the temperature in the house 65 degrees in summer and 85 degrees in winter. And if we just reversed that, we'd be in good shape! But my electric bill at home was $600 last month. So, you know, these kind of things make a difference.

B: Alright-

G: And while we're on this, one of the things I didn't say a while ago I meant to say: if you think that industry is going to help us in this situation, look at how much some of the

utility companies fight buying back electricity when you have excess electricity. Now this is something that needs to be done at the highest level. Because if we're going to pay 12 cents per kilowatt-hour as we pay in some places in the South, by golly, we don't need to sell 'em back electricity for 1.5 cent. And so these are some of the things that are really important, to me anyway.

B: So which messages, um, and I don't know if you heard the question. The question that we're discussing is, what would it take to motivate people to learn about renewable energy? That's what we just finished discussing. And now, the second part of that question is, which messages should be avoided? Like, what would you not choose to use for teaching people, to get them interested in renewable energy? Which avenue would you not pursue if you were in charge of an Extension program on this?

R: Well, as I'd mentioned, in a previous lightning session, in Wyoming, I'd probably not start by talking about climate change. That just isn't going to work. [Laughter] And, uh, I usually talk about those things that climate change is hypothesized to create, like: increased drought, water quality, air quality issues, ozone problems, ground water pollution, that kind of stuff. So start there, I think.

B: Okay.

A: Yeah, I suppose that's right, to sort of talk about technologies that really are well-established and aren't sort of in the development stage, where you can find yourself having to back track and say, "Oh, I told you last month that this was going to happen but now it looks like that's not going to happen." So I do think you have to be careful about that. Um, I'm troubled about that- you know, that you can't talk about things that you

know, from research, are true. That really bothers me, you know? But I've been in that situation where you don't get to talk at all if you start that way. I think it's more of a problem.

B: Do you think there's a solution for that mindset, in a meeting? Have you ever thought of a different way to start a meeting to combat that sentiment?

A: Well, I think you have to go backwards, as you mentioned. You have to say, in our region, we experienced this forest fire. What was the cause of that? Why were those trees dead and standing? You know, and then you can begin to say, "Well, there's been an unusual…" And then you can sort of bring things around, rather than starting with the politically sensitive.

B: So talking about the effects but not actually [what] caused it to begin with?

A: Right.

K: But then tying that into beetle kill and climate change related to that. But not starting with climate change.

B: [To a latecomer to the group] If you wouldn't mind stating your name and what university you represent.

V: Okay; [Name withheld], Oregon State University.

B: And what's your opinion? What things would you not recommend to get people interested in renewable energies if Extension took it on?

V: Um, that is a tough question because I think we ought to be able to put as much on the table as possible. My mind is thinking of something else though. I'm thinking that we shouldn't highlight at first things that are not approved within our state. There are state

guidelines and rules, regulations that are designed for existing technologies. And many of the new technologies don't have rules and regulations, so the next thing you know is when you start talking about all of the different things you can do, some of them aren't legal. And unfortunately, because we are a land grant institution, we have to be real careful with that. So we maybe have to do a triage, or, you know, say, these are the things that are currently available. These are the things that are on the- being worked out, haven't been legalized yet, and here are things that are way out in the future. So. That's what I can come up with on that one.

K: I'd probably just say what was already said. Climate change- I think that was really well put. Starting with the local issue that everybody agrees upon, something that's non-controversial and then maybe peeling that back. You know, climate change is perhaps the- what's behind it all, but not starting with that in the beginning.

G: Well I've got a little bit different take on it. I would say the thing that we've done so wrong in energy is we have wasted money. And let me ask you a question, as Extensionists. If somebody comes to you with a new way of fertilizing corn, before you recommend that to your constituents, what do you want to know?

A: Does it work?

G: Does it work. Now, let's take the energy picture. There's another way you could do that. You could say, well I'm going to recommend this and we're going to pay you to use this new technique. We don't know if it's going to work or not, but we'll pay you to use it. Those are two ways you could get people to do it, isn't it? Well what we've done with energy, is we've said we don't know how to do certain things, but we're going to pay you

to try to make it work. And it didn't work! Right now we [the state of Georgia] have on the books a requirement that you use, I think it's 10 or 12 billion gallons of cellulosic ethanol. For which we don't have any cellulosic ethanol, other than a few million gallons, we got a little bit. But we have taken money and made the federal government an entrepreneur using venture capital, your money, tax money, to implement a technology for which we don't have a scientific basis. They spent- the USDA spent $80 million of our money down in Georgia- Soperton, Georgia; DOE spent twice that, on an ethanol plant to make ethanol out of pine trees. They spent all the money, never did make any ethanol, and now they're bankrupt and they quit. Now, what's wrong with that? They didn't have a research basis. So what we've done, is we have not had the right leadership to do the research before we try to implement a technology.

V: You're trying to shortcut so you do both of them at the same time.

G: Beg your pardon?

V: We did the same, all of this; we did the research and the work at the same time.

G: Yeah! And that doesn't work. You do the research and show that it will work and then you implement it!

V: Yeah.

G: And then the truth is, you don't have to have any incentive if it's competitive.

V: Mm-hmm. That's right.

G: So that's so simple and so obvious but we haven't learned that yet. So that's the kind of message we ought to be conveying.

V: So are we allowed to say the word "lobbyist"?

G: Beg your pardon?

V: Are we allowed to say the word "lobbyist"?

G: Absolutely…absolutely.

B: Alright for question number four. It says please explain the current level of interest your clientele have in energy. So, whatever scale you want to use, no interest, huge interest, "I hear this sometimes."

R: Oh, I think there's a lot of interest in energy. As a, um, an employer, as a, uh, foremen who fill their diesel trucks up and complain about how much it costs, as a, um, when they turn the lights on. So there's a lot in my area, quite a bit [of interest].

A: I think there is some interest but I don't know how accurate it is. I think in the public's mind- I don't think people have a real sense of how much energy they really use, especially compared to other people in the world. And that people are very satisfied if they have a dishwasher that has a star on the front. And it doesn't really- you know, when we start talking about real metrics, about tons of carbon and those kinds of things, I don't think people sort of get what sustainability even means for energy. I think we've got a long way to go to get people sort of in the right ballpark, even.

V: I agree with that statement. For sure we have a long ways to go. I get- because I work in sustainability- obviously I get a lot of energy questions but the other question is, is Extension the right place to go? In Oregon, we have Energy Trust of Oregon. They handle all the energy stuff. We don't actually have an energy program area anymore. So, it's a moot point. I point people to them. That's what I do.

K: I'm going to pass.

G: Well, I'm going to respond to that because this was one of my deep concerns while I was under secretary. DOE would like to overtake the energy issues. They would like to have their own Extension folks.

V: Oh yeah.

G: They would like to be *the* energy people. I used to argue that that's a bunch of baloney. The energy issue is more in agriculture than it is in DOE. We don't expect somebody else to process all of our corn to use. We don't expect anybody else to process anything else, so why should we expect DOE to process our products to make energy? That's our job! But in Congress, they don't even consider us. We have a horrible challenge ahead of us. We don't need to let the DOE people create their own Extension service to take- they have the makings of it right now. And let me tell you something, they have the right people in DOE, they're going to take the energy issue away from Extension if we don't continue what we're doing. This is why it's so critical that what I've said earlier is so important, that you guys are on the right track. We just need to keep moving.

V: Let me clarify. In Oregon, Energy Trust of Oregon is a non-profit.

G: Well that, that's good.

V: Yeah. So-

G: But DOE does have a lot of energy centers.

V: Oh absolutely, yeah.

G: We're on the same page. [Laughter]

B: Alright, the next question is, what are the primary barriers clientele have in transitioning to renewable energy sources? And what leads you to this perception? What are the main barriers people you work with have to transitioning into renewables?

R: Uh, well, in our state, the flexibility to actually move to a- let's say wind or something like that- I guess that's one. The state of Wyoming isn't going to be a major producer of biodiesel anyway, so that's probably not going to happen. Um, uh and we're a small state and we're spread all over the place and we're kind of dependent, it's kind of hard to be a, build into energy efficiency and transportation a lot because people have to drive long ways anyway, so. Those are some of the barriers, I guess. If you could collapse our communities a little closer together, that might help.

A: I think I'll use your answer from before. It's $4 per gallon gas. That's the barrier. You know, $6 and $8 gallon per gas and we'll see all kinds of energy alternatives, all sorts of renewable projects from geothermal to protovoltic, wind. The problem is subsidized energy, fossil fuels, subsidized costs. We're not going to move forward until it becomes economically advantageous for us to do something else.

G: Exactly.

V: And I go along with that too. Talking about households, time is a huge one. I actually put together a program called Jump Start Weekend, where people actually pledged as part of this ongoing course that they were doing, that they would do ten things (and they got to choose what they were) that would make their homes and their cars more energy efficient. Put air in their tires, for goodness sakes. Take the ski rack off the car when it's summer season. You know, that kind of thing. And they all agreed what they'd do. And

they didn't do it. And time after time after time, even though they chose, they pledged, they wrote it down, "[I] didn't have time to do it." [They] felt bad about it, but in the scheme of things, life wasn't painful enough; it wasn't expensive enough that it was worth doing. And I was always so often dismayed. Because these are great people: they're really nice; they want to make a difference. They might do one or two, three things, but most of the time they didn't do it. It wasn't important to do it.

K: And those are people who want to make a difference.

V: Yeah, and want to make a difference! And frankly, have I caulked my house yet? Hmm. I haven't done it either.

K: Yeah, I mean, I would just echo that exactly. I think people are going to have to feel some pain in order to take action. I would like to think that people would feel moral responsibility for the next seven generations, but unfortunately, I think it's gonna- yeah. Cost of gas, whatever. They're going to have to feel it a little bit more.

G: Well the truth is, we- this country- are all like you. I was telling somebody just at lunch that we use as much energy to keep ourselves cool in summer as the 60 countries of Africa use for everything. I just read last week that our oil consumption is now peaking back up and it's back at 87 million barrels per day. The U.S. is still using almost 20 million barrels a day. We use almost 25% of the world's energy with only- a little less than 5% of the world's population. Now my question is, how long will the world put up with us? I don't think the world is going to put up with us forever; I really don't. If that doesn't ring a bell – I know when I talk with my brothers and all [of] my family, I try to talk about these sorts of things, and they just laugh. But that's what most people do. Most

people really- "I got it now you go get it." But I don't- the truth is, if this planet's going to survive, we can't have as many have-nots of the world as we have now. The direction that we are going, I think we've got some real challenges ahead of us. And I think energy is- energy and water are the two things that are going to bring things to a head, probably by the end of this century.

V: Just one other point. I did some research, probably six or seven years ago. We asked people at- who came to sustainable living workshops how aware they thought they were. Let's say how energy efficient they thought their family was. And the majority said, something like 85% said, "Yeah, we're very energy efficient. And we just are here to make ourselves a little bit better. But we're really good at it." But then what was interesting: I asked them the same question. I said, "What about the other people in your neighborhood? How energy efficient do you think they are?" And they said 80% of the people in their neighborhood were not energy efficient. What that really means is we have a false sense of how energy efficient we really are. Because none of us are.

G: Exactly.

V: It was so funny, I just laugh at that.

G: Well I just got through telling my wife- (who likes the house cool in summer and hot in winter) but she turns off lights and I get fussed at at least five times a day because I'm a light- I turn on lights. And I try to tell her that your job is to turn 'em off, honey; my job is to turn them on. [Laughter] That doesn't work. That doesn't work! [More laughter]

V: It must be fun to watch you guys! [Laughter]

G: But little things like that. And driving. Well, when I moved back from [Washington D.C.], I made two trips in a van/truck- rented truck. And on one trip, my son drove, and he drove at about 70 [mph]. Well, I'm old-fashioned; I drive about 55 [mph] no matter what. And the use of gas in that truck; it must have been 25% less for me, driving 55 [mph], than with him, driving 70 [mph]. So there's all sorts of things we could do if we would do them.

V: Yeah, what's with the 80-mile per hour here in Utah? [Sarcasm until p. 122]

B: Life is short; hurry up!

V: Oh my god, it's scary! I mean-

R: Is that on the interstate?

B: In some parts. In some parts it's 65 [mph], in some parts it's 80 [mph].

K: Yeah, that's a recent thing.

V: Yeah, well it's suicidal!

G: Why don't you go ahead and make it 90 [mph]?

B: Yeah, let's just do that?

R: Montana's going to be envious.

B: We're all in a hurry to get to southern Utah.

G: Well I would be lost at 55 [mph], wouldn't I?

B: Yeah-

V: Oh, you would be run over.

B: The next question is, does your county have roots in fossil fuels, natural, gas, or nuclear energy production? Could this be cause renewable energy to be perceived as a threat among the clientele you serve?

R: Well I'm a state specialist, so do you want me to talk about the state or the county? The county has no fossil fuels. It has wind and that's about it.

B: And then do you think in the state fossil fuels- [or rather] renewables are perceived as a threat?

R: Well that's an interesting discussion because yeah, they're viewed- we're the only state in the country that actually taxes wind. But some of the work, some of the studies done have shown that actually the wind is an important compliment to the fossil fuel production of electricity anyway. The industry (the coal industry) doesn't realize [this]. But it's viewed- the fossil fuel industry views it as "we pay severance taxes and royalty fees; wind should pay something." So. You know, they have that. Again, we're the only state that actually does that, unfortunately.

A: Yeah, I don't think our county has any fossil fuel stakes. But yeah, in probably no renewable energy, either. In the county, most of the energy for electricity is hydroelectric, about 75%. So I think people ignore it, primarily. It doesn't come up as an issue. It's just there, like oranges in the grocery store.

V: We don't have fossil fuels in Oregon. However, while you would think that we have primarily hydro, the majority of our electricity, energy for electricity, is coal. About 69%, which is kind of a surprise. And the other part is, alluding to what Gale was talking about, was the large electric companies do penalize people who try to go with alternative

energies and have solar panels on their roofs. And if you make more energy than you actually use, that actually goes away. And you are not allowed to keep that extra amount of money. If you're in California, California expects you to do that and it's a little incentive for you to be able to continue to put solar panels on your roof.

K: Pass.

G: What was the question again?

B: Right here, number six.

G: [Pause] Well I think that clearly, the reason I'm so high on bioenergy or capturing the sun's energy, is I think that if there's anything that will help world- countries to get along, it's developing an energy source. And every other source of energy you can talk about, whether it's coal, whether it's petroleum, whether it's natural gas- only certain countries are blessed with that resource. But every country has access to the sun. And the sun is the only ultimate source of energy that we have. And, uh, I think that we need to continue moving in that direction. Trying to build the efficiency, the effectiveness of either photovoltaic capture of the sun's energy or green plant photosynthesis (which are the two ways of capturing the sun's energy). But that's really the hope for mankind, is the sun. Do you agree with that?

V: Mm-hmm, definitely.

B: Alright, there're three more questions and we've got about 20 minutes. So the next question is, what groups should be targeted for renewable energy programmatic efforts? So, another way to say that is when marketing renewable energy technologies, should there be a difference in presentation to those that are urban, versus rural? Should there be

a difference in how that renewable energy would be presented? [To Gale Buchanan] We'll start over here with you, go backwards.

G: Well I think that both- yes, there's a difference. Simply because of the opportunities for the urban dweller are somewhat different from the rural people. But we need to tailor the message so that it capitalizes on the strengths of both. The urban dweller that lives in an apartment has little opportunity for a windmill. They certainly don't have much opportunity for anything else. But the rural person has ways in which they can capture the sun's energy or use energy is a different way. So I think we need to tailor the message such that we capitalize and we make it more appealing, both to the urban dweller and to the rural dweller. I know when I was in Washington [D.C.], we bought a car especially to go to Washington; [we] bought a little car so it would be easy to park. We didn't need a car! Because we rode the bus or rode the metro everywhere we went. Except one week we drove it to the commissary at Fort Meyer to buy groceries. And I bought a brand new car; we kept it three years, and had 2100 miles on it when we sold it. 1400 miles was going to Washington and coming back and the rest of it- we spent less than 500 miles in three years. So, the differences between rural and urban are clear. We need to capitalize on the strengths of each.

K: Yeah, and I would think our message needs to be adapted to not only to rural and urban but also just other cultural differences, education-

B: Yeah, definitely, I-

G: Absolutely.

B: The next part of this question actually goes into that; it brings age into that. If you want to expand into that, that would be fine.

K: Yeah, so again, not only urban and rural. I mean, I think we should pay attention to that, but again, also looking at cultural perspectives.

G: Cultural, absolutely.

K: You know, there's a large Latino population in our community so how do we message it so that it makes sense for that community? So, looking at education backgrounds, that kind of thing, age. Yeah, so.

V: Pass.

A: I think especially [with] the urban opportunity, the message can be about public transportation and the- get at least rid of one of those cars. You know, I was astounded that we found a few years ago that there are more cars than there are licensed drivers in the United States. You know, I don't-

G: We have 270 million vehicles, a little over 300 million people.

A: Yeah!

G: We have almost a car apiece, and that includes the babies!

A: Yeah! And that's the babies too! It's astounding.

G: In fact we have a, let's see. We have 250 million vehicles and 300 million people. That's almost, what, eight tenths of a vehicle per person. China has 12 [million]- no China has about 100 [million]. They're gaining rapidly. In fact, China is making more cars, selling more cars per year than we're making now. But India is only a tenth of what China is. But the truth is, do you think those people don't want to ride?

A: Of course they do.

G: They want to ride just as much as we do.

K: And they're gaining the capacity to purchase vehicles.

G: And they're gaining the capacity. That's why the energy usage is- we're not increasing energy usage much. In fact, we've been around that 20 million barrels a day for the past decade. In fact, we're down a little bit. But the world consumption is increasing and when India really starts rolling, they're going to get as many cars per capita as China does and that's going to take a slug of oil because they don't have any.

A: Right. So anyway, it seems like transportation and building design focus on urban areas. In rural areas, it's kind of what kind of assets do you have within the community to satisfy your needs.

R: Well I think the priority needs to be on the urban side of it. The rural areas need it too, but it's a little less of an issue because they've dealt with this issue for a long time, simply because it costs them a lot more to get where they want to go. I suppose if we want high gasoline and diesel prices we need to thank the Chinese.

A: Yeah.

R: They're the ones that are going to do it, if nothing else. They're almost there right now. It's no coincidence that we had high gasoline and diesel prices and one of the worst recessions we've had since the Great Depression. It should've gone down but it didn't because of the demand, the international demand. But I think we need to look at building more energy efficient, efficiency, like you were saying, in those urban areas. Small urban areas as well as the large urban areas. We can't get around that. We need to work on that.

We need to make them more aware, people in urban areas, more aware of the different aspects, that matrix of energy consumption that they have and what kind of alternatives can replace it with. Wind, rooftop solar for the electricity grid. You're going to need that plus backstop technology because when the wind's not blowing or it's cloudy you're going to need something else. Those kinds of things in the community. You need to work on those kinds of issues and get a sustainable level, a reliable level of electricity as well as other alternative sources out there.

B: Um, question number eight is how can renewable energy programmatic efforts connect to Extension's traditional audiences. So, if there were to be a renewable energy program within Extension, what would be the best way to connect that to the traditional audiences that you work with through Extension? Is there like a theme you could couple it with, like agriculture, community building? Is there anything you would recommend?

G: Well almost every aspect of agriculture has an energy component. I mean if you look at- we don't give ourselves enough credit for what we've done. Look at how we have reduced fuel consumption and yet maintained productivity through reduced tillage and things like that. We've done a fantastic job that nobody ever talks to much about. But we've made tremendous strides in that area. But processing, all of the processing has got an energy component. So energy ought to be an integrated component in just about everything we do, in my opinion.

V: I'm thinking of one example that we could do in rural America. It's an old technology coming back; it's the windmills for pumping water.

G: Absolutely.

V: You like that one? Okay, uh.

G: Absolutely!

V: It's something that we noticed because we drove from Oregon to here. And there are a lot of center pivots, there are a whole bunch of other things but for the cattle troughs, for the drip feeders, for wildlife, that kind of thing, we saw a bunch of dead windmills, kind of old relics. That's an easy technology. They still make them. And basically if there was some way that we could get our foot in the door by saying, "Hey! We've got this special deal where we can help you with *this*," it might allow us to get in more-

G: And even in parts of the country that have such erratic wind- which we don't have enough wind to make electricity in the South-

V: Ha! We certainly don't have a problem where I am!

G: I'm with you. But even in those parts of the country, windmills were very common because you had water tanks and when you did have a little wind, you'd accumulate a little water that would serve for the times for the days when we didn't have any. But I'm like you. We need to be doing more research on older technology to bring it up to date to implement that sort of thing. I agree with you.

A: Yeah I agree. I think that there are so many opportunities for renewables in the rural areas that I think it's easy to connect to the traditional audience. I think it would be a mistake for Extension to not see urban areas as part of the new audience though. That's where it's going to make a difference.

R: Well I don't- I kind of agree with everything you guys have said, so it's kind of hard to [come up with something]. My only cautionary note, I think, is that we shouldn't

assume that renewable energy has no impacts. Ecological impacts can be significant. A photovoltaic plant is basically an industrial site. There's nothing growing underneath it. And if you're going to put a wind power plant someplace, you're going to need high power transmission lines. In which case, in our state, we have to work them around Sage Grouse corridors so that they don't uh- so that the Sage Grouse doesn't get listed. So I'm not convinced that renewables hold the future that we think they do, that we like to think they do. They need to be a more important part of our energy grid, our matrix, but there are considerable problems with renewables, I think.

G: There are two books that I think that anybody who has an interest in energy ought to read. One is called *The Crash Course* by Martenson, which paints a very bleak picture of the energy future. And then there's a book, *Powering the Future*, and I can't remember that guy's name, he's a Nobel Laureate. But he, in essence, says we're going to win the lottery: "Don't worry, fellas, we're going to develop technology that will make this concern about energy passé." He's a Nobel Laureate, so you've got to-

V: [Sarcastically] He's got to be right.

G: So, but those two books. I read them almost at the same time, and got completely different opinions. I just think that anybody who has any concern about energy ought to read those two books cover to cover.

V: I think, and I wasn't in at the beginning of all this, but I think we're missing one key point. [Pause] One of the things that we don't espouse within Extension or within the United States is energy conservation. When you look at the difference- and I spend a lot of time talking to people about the difference between Western Europe and the United

States- they use 20% less consumption, energy consumption, than we do. They live- they have a higher quality of life than we do. They have a happier, higher happiness index than we do. Why aren't we talking energy conservation? I'm not quite ready to go back to Jimmy Carter wearing his little sweater and talking to us on- was that, oh we did have TV back then. But if we just conserved energy 20 percent, a lot of this conversation wouldn't have to be happening.

B: Energy cost in Europe versus energy cost in the U.S.; are they more expensive?

V: They're more expensive but that doesn't seem to be the mitigating factor.

B: Okay, that's not causing people to use less?

V: No, it's something about quality of life kind of thing. Though their gas certainly does cost a lot more.

[PA Announcement]

G: Can I add a question to that?

B: Of course!

G: Why and what do we do about nuclear energy? You said that 70% of your energy comes from coal.

V: Yeah.

G: France gets 70% of its energy- France gets 70% of their energy from nuclear.

V: Old nuclear, too.

G: Yeah. We get, what, 9% or something, I can't remember the exact [amount]. But why and what's the future for nuclear energy in this country? Have we- are we going to not embrace nuclear as a major source in the future?

V: There's a new technology that apparently is out (that I know very little about) that uses the nuclear waste from other nuclear plants then basically uses a much smaller "footprint," I'd have to call it. But we are- god, guys, you're going to hear me say it- I think there is a role for new nuclear. There is not a role for clean coal.

G: I think you're right.

V: God, three times you've said this! [Laughter] I like you! Nobody says this!

A: I don't know. Particularly after Japan I don't-

V: Oh man…

A: I think it's going to be a long, long time before we're politically able to use stuff like that.

V: That was an old plant.

A: But it was a major-

B: It might take a while for that to fade out of people's memories.

V: Well, it's still coming our way, and I'm on the West Coast.

B: Yeah.

G: Well, maybe we learn from our mistakes. Of course, Three Mile Island was our disaster and it was prevented. Nothing, nobody was really hurt from Three Mile Island.

V: Yeah, but then look at Chernobyl.

G: Chernobyl was a disaster waiting to happen and everybody says it was. It was made- the facility was made cheaply, made by Russian standards (which are not the high sort). But France has not had a single incident.

V: Nope, they haven't, but they have ones that they've had to decommission and completely encase in concrete and have to guard 24 hours a day for the rest of…humanity.

G: Eternity.

V: Yeah. That's a toughie.

G: Well, but the-

V: More than a toughie.

G: If we're going to insist on having 9 billion people by 2050, and I'm not willing to say that a single one of those needs to be done away with, then we're going to have to embrace technology. We have no choice. We can't feed ourselves without biotechnology. We can't provide energy; we can't do anything without technology. We have to try to make it as safe as we can. And I think that's the attitude we have to take. And so with that, I think that we've got to embrace nuclear. We'd like to make it as a safe as we could and not build it in my backyard but-

B: Yeah, not in my backyard! [Laughter]

V: Nevada's empty!

B: Just stick it on the desert!

G: Yeah, put it on the desert, I hear it's Utah!

B: It's got sagebrush on it!

R: You know, the difficulty is whether you like nuclear, you don't like nuclear, or you think nuclear- or you like coal or you don't like coal: it's what's going to replace the base load. You know, you can't- you can move to one or the other one, but when you do that,

you're going to create environmental risks, environmental impacts. Pavillion, Wyoming: one of the reasons why there's a groundwater contamination issue is because of the old uranium mining that occurred in the area. It wasn't because of fracking. So, so uh- but on the other hand, nuclear, especially the new hybrid, is very clean and you can build them in small, modular components instead of large ones. And so our state thinks it's a great idea. I don't think it's going to happen in our state. There are all sorts of reasons why it can't or won't because for one thing, if you build a big nuclear power plant, you've got to have the transmission lines to get it out and you pretty much have congested lines all the way around us anyway without building a lot more. So we have to think about which base load we're going to want. Sometimes renewables can be used. Wind blowing in Eastern Colorado is counter-cyclical to wind blowing in Wyoming. Colorado wants to build only wind in Colorado, so they won't buy any Wyoming wind, so there isn't anybody building any more wind plants because of that. That variation creates problems on the grid that are very important. You can't track them. What we want the base load to be is not clear, I think.

G: I think back again to what you said about conservation. If we really practice conservation and brought our energy consumption down to a more reasonable level, we'd have a lot more options to meet expectations. And if we used more efficient automobiles- there's a million ways we could address the issue. The issue is, do we have the will to do it? And of course, one of the things on petroleum: I know we've got all of this shale and all of these tar sands out in your guys' neck of the woods, but if you read Martenson's book on *Crash Course*, he talks about the- you know if you get energy from Saudi

Arabia, it's essentially free for pumping it out of the ground. Almost no processing, goes straight into a refinery. But if you take this shale oil or these tar sands, you take a tremendous amount of energy to get the stuff and unbelievable amounts of water to process it before you can get something to put in a refinery.

R: Plus, the tar sands aren't going to affect the price of gasoline or diesel.

Energy Focus Group #3
Extension Sustainability Summit – Newpark Resort – Park City, UT
Wednesday, October 2, 2013 (62 minutes)

M: Okay, so just as an icebreaker, we'll go around and introduce ourselves. So, do you want to start?

D: Sure, my name's [withheld]. I work for Utah State University. I direct something called the Utah State University Botanical Center, which is about 20 miles north of Salt Lake City. It's a multi-faceted, multi-purpose facility. It brings research and teaching and service, all of those land grant things right to the public. It's not on the main campus; it's about 60 miles away from our main campus, right in the middle of a suburban area. And then I'm an associate professor in landscape architecture at Utah State.

N: Are you an architect?

D: Landscape.

N: Oh a landscape architect! People actually have to work at something like that. Landscape architects- the kind I knew- they put in a lot of hours.

D: It's a lot of time.

N: But they may be surgical in things. Well, they'd -

M: I'm sorry, can I interrupt? In your introduction if you could tell us how long you- what university you're from and how long you've been involved with Extension in addition to what you do.

N: Ah. I have done projects for Extension in different states but I am not a member of Cooperative Extension. I am a defrocked academic and recovering entrepreneur who- working in entrepreneurship involvement. I get to travel around the country, around the world, helping communities grow, entrepreneurs. I have a great passion in all that, in sustainable entrepreneurship. And that's what brings me here, to learn more about what's going on. I'm also involved with the Woody Biomass group in Idaho.

D: Okay.

K: My name is [withheld]. I'm a grad student with [name withheld] at Utah State University. I've never really been involved in Extension before but potential in my thesis to tie that in as well as future career. So I'm kind of here as an observer, a little bit.

M: Okay.

N: Master's or PhD?

K: Master's.

J: We're going to have some positions open in Wisconsin, if you want to come to Wisconsin!

K: Sweet!

J: So what was the question we have to answer?

M: Just your name, what university you're from, and how long you've been involved in Extension and your role.

J: Um, [Name withheld], University of Wisconsin Extension. I've been in my current role for three weeks and I've been in Extension for one role or another for about seven and a half years. Most of that is a county educator and the last three weeks as a state specialist in sustainable communities.

M: Okay, cool.

N: I didn't say my name; should I have?

M: I don't think it matters because this is- it's being cleared by IRB, so.

N: Okay.

P: So I'm [Name withheld]. I'm with the University of Arizona and out of the Phoenix office, which is Maricopa County. I've been with Extension for 15 years, all of it as an agricultural literacy program, starting as staff, then moving into faculty and then served five years as a county Extension director and insanity played a role and I stepped down. [Laughs]

N: What is agricultural literacy?

P: It's working with teachers on how to incorporate agriculture concepts into their classrooms.

N: Ah! Cool.

M: Okay. So this is just going to be open; we're not going to go one by one on these. These questions are jump in, and then leave enough room for somebody else to jump in as well. Um, first question is, does your state's Extension service offer renewable energy outreach? If so, what does that outreach look like? Is it like a comprehensive renewable energy program? Offer fact sheets to guide interested clients to online resources and in-

person contacts? Is this also offered at the county level? So, basically, is renewable energy outreach and education viewed as an important area among fellow employees in the county office or department? Or do you see- foresee an increased emphasis placed on energy education in the future, and what leads you to believe this?

J: This is J, from Wisconsin. For the first part of the question, yes, we do all of the above. Everything from the pre-canned presentations and fact sheets to providing special support to county educators to do the customized response to the community that has an asset or a need or opportunity that they want to address, as it relates to energy. We always feel like our capacity isn't what we want it to be, in terms of the need that communities are identifying. In terms of being supportive of other people in the county office, I think it depends on the county office. You know, some family living educators are fluent in and interested in energy and some are not. Same with 4H and Ag. We have great people in each of those program areas that are interested in energy, but I can't speak for them as a group statewide. But I think there's a great emphasis in Wisconsin for more cross-pollination, so getting each program area involved when we're working on a project.

M: Okay. Anybody else? Extension programming and renewable energy outreach? Anybody got that going on?

P: I would say that at the University of Arizona we don't. You could correct me if I'm wrong, but I'm not aware of it. And we don't have those conversations in our office, even.

M: Well I could fill in one little gap there. As the only community development agent in the entire state, I have been doing some outreach with regard to land-use suitability for

solar facilities around the state. But that's it. I mean really, that's essentially um- [Remembers something else] and I have been doing renewable energy workshops. In fact, I've got one coming up in Wilcox in a couple of weeks. So, as-

P: You concentrate mainly on rural areas where I'm in urban county.

M: Actually, I'm doing both.

P: Okay.

M: With my land use suitability, I cover cities and rural areas. It's state-wide.

P: Good! Okay.

M: But as of now, I am the only community development agent in the state [Arizona], and my area of responsibility is about the size of New England, just for the southeastern part of the state! So I am a little shorthanded.

N: I think that's a recurring theme that we've been hearing all day, is that there's so much to do. I'm not aware of what particularly- I think folks in Idaho would say yes, they're doing it, but it's one of the whole bunch of things that are all a priority and behind all of the ones that are a "plus" priority. That, you know, figuring out what comes- you don't want to give up the turf but you just don't have the resources to leverage that. I'm thinking that size of New England is pretty damn scary.

P: Mm-hmm.

N: So how do you leverage yourself?

M: Very carefully.

N: I think that's the, um- can you have [pause] devotees, are you training protégées to um-

M: Not at this point, but we're making resources available through the internet. I do these presentations and say if you want to follow up on these resources-

N: What's effective, most effective in terms of that? Because that's I think, an important takeaway that it will have.

M: Well, the renewable energy workshops are kind of one-offs with communities. And they pull in other community resources. So once those presentations, or once those workshops are done, those participants have a link to somebody (one of the presenters) and whatever it is they were offering, like help with a grant with REAP money, USDA Enroll programs, pro-development program money. So they generally get partnered up with somebody that they heard at the workshop and pursue it from there. Does anybody else have anything?

D: Do you know anything about what Ros is doing?

K: I'm not sure about that.

D: The things we do are site-specific to this facility that we're working with. We have a building that is nearly completely solar powered; we're doing solar hot water heating. We don't have any wind; we don't do any wind stuff. Although the university is doing things- I can't say whether or not Extension is doing them exclusively, but we have some folks in our business school that are strong, strong proponents of especially wind energy development. And they've gone far and wide doing a lot of presentations and I'm sure there are folks in our natural resources area, I'm just really not sure how it's coordinated, if it's through Extension or not. Not on the county level.

M: Right. I could add a couple more things that we've- that some of our renewable energy workshops have put some of the technology available for ag interest in irrigation with some of the companies that are in the area. And they in turn, the companies themselves, provide the information and demonstrations on how their new technology [works]. Solar pumps, for example. And one other new area is the 4H camp that we own, that the University of Arizona owns; it's director, Kirk, is really interested in making that energy efficient and then using that as a mechanism for outreach to the kids that attend the camp.

P: And that's a new camp. It's, what, two years [old]?

M: Yeah, yeah. Anybody else? So we can move on to question two. What do you perceive Extension has to offer in energy programming, given the role of public utilities, electric cooperatives, USDA, DOE, and state energy offices? Kind of what we were talking about earlier. What's the niche? What's our niche, if it's being covered by other entities in the state? I think, J, you mentioned though- you had a really good point over at our other table that even though there's a state energy office, they don't do outreach or education.

D: They're not very good at it, yeah.

J: Well they used to have people who did it, outreach and education. But I think that's our niche, is to do that. And the utilities are not motivated, really, generally speaking, to teach renewables or efficiency because it eats into their business model. So, depending on the regulatory climate, they may be either motivated by state policies to do it or they might not be. And so right now, in Wisconsin, they're not. So they aren't doing it. Five

years ago, it was different. They were financially motivated to be doing it. So I think that's Extension's niche, is to have that kind of community, grass-level education to increase basic energy literacy. And start to connect the dots because [there is a lack of] federal agencies, especially in Wisconsin. Other than USDA, there are no real boots on the ground, and USDA has a lot of other things that they do besides energy. So I think that's Extension's role, especially as a county educator.

N: I would- this is N from Idaho- I would echo the- plus one to the education side also. Where it's feasible that, they being the broker of neutral turf, [they also be] the connector and convener rather than [indiscernible] is powerful. I was thinking about what J was saying. In Idaho our- Vista Power in north Idaho and eastern Washington has, and now Idaho Power [too], are actually funding projects to do this education because they have a quasi-legal commitment to spend money on economic development. Like, "What the hell, we didn't spend anywhere near what we thought we were, so oh crap." That's like a foundation finding out they haven't spent enough yet. They went out and said, okay, we'll get other people to do this. Vista has been, in particular, has been incredibly innovative in what they've spent the money on. They funded a center at North Idaho Community College, which totally freaked out Idaho Power, because everyone knows, they've got to put up a hundred now, put $100K up. But they've funded educational projects. And they've said that- my god, I guess they gave some thought- either they gave some thought to it or they've had these ideas on the shelf, waiting for the nudge. But the education, informing people about energy is so important. Instead of saying, I know a crap ton about this stuff, and [personally] I sit here and I [realize] how much I don't

know. And imagine all the folks out there with a little information, gently provided, as in your botanical center, deviously implementing it, is, this is the kind of thing. You know, it's a great thing for a programmer.

D: Maybe making them aware [of opportunities] as well. As a programmer, you can get a deal on LEDs, you know.

P: Mm-hmm!

D: Or there's a deal where you can get some tax break on installing solar out-water systems.

J: Right.

D: They don't have a clue. They just think, "That is so cool!" And you walk away kind of sad because they don't have the slightest idea how to start.

All: Yeah, mm-hmm. [General consensus]

N: Is being able to connect them to the right people, is- [new thought] At an economic development meeting, we brought [in] a guy from Vista Power Company and he told them, okay, you can get the light bulbs and your weather stripping and all this, and they're like, "Free?" And I [was sitting there] laughing. I'd lived in Montana and I talked to this guy in a bar. He worked for Montana Power and he seemed happy with his job. I'm like, what's wrong with you? And he said, "Oh, I get to do the fun stuff!" And by the time we were done, I got him to come by and my whole apartment building- they did all the literature, all the testing- mad scientists at work. They gave me four light bulbs. I had to sign something that said I wouldn't sell them. They did some weather stripping, and I got a $30 check in the mail.

P: Mm.

N: And I found out, oh yeah, I've already paid for this, in our tariffs! And yeah, people don't know it's out there, even when you tell them. They don't believe it. There are so many amazing programs across this area. I mean, I think about all the stuff you were talking about, J. You know, how many people go, "I didn't know we did that!" How many times do you hear that?

J: Uh, daily. [Laughter]

M: I think that um, actually speaks one of the other- one of the original goals was how we were talking about needs assessment-

N: We need more people to participate-

M: Uh, needs assessment and research-based information coming right out of our universities. And so this side, this shows another side of that, where we are a convener and connector, as you- using your [name withheld] words. Where we're not necessarily providing research-based information, we're convening and connecting to other sources outside the university. That's something I do a lot in my programs. [Name withheld], I'm sure you've done the same thing where we host and sponsor the workshops, pick our speakers and let them go to town. That's an important role for Extension.

P: And they're willing to fund it, too, because they don't have that expertise but they need to get it done because somebody's told them they have to get it done.

M: Right.

P: Legislation or whatever. So they come to us to know that we can do and do it well.

M: Right.

N: I know you guys are new, but who's the coolest speaker that you've arranged for with the Botanical Center?

D: Who's the coolest speaker?

N: I mean, who's one that's like, oh my god, this is a [great speaker]?

D: Well that's something where we really fall short because we- we really should bring- any of these kinds of folks would be great.

J: Pay my airfare and I'll come out here no charge! [Laughter]

N: We all heard that!

D: I think that idea of finding Extension specialists whose job it is to share this kind of stuff, to inform; you know, regionally inform or smaller scale and in other parts of the country; that's really meaningful, and it's a wonderful idea.

K: Do you have a lot of speakers that come?

D: No. That's what I was trying to say, is we're dismally, woefully inadequate in that area. We're just trying to keep the door open.

M: Okay, we'll move on to question three. What would it take to motivate people to learn about renewable energy? Now he's got some prompts here-

N: Are we Lanasters or Starks? [Chuckles]

M: Well I think the-

N: Because if it's Lanasters, it's easy.

J: When we designed our energy independent communities program in Wisconsin, for example, in 2007, was when we were designing it. Gas was like $4.50 a gallon, so it was super easy to talk to people about energy because they're like, "Oh, my commute just

doubled in price for me! What can I do?" And then you can use gas prices to enter and talk about other energy. But now, gas is down to a "more acceptable" rate of $3.50 a gallon. And so, you know, when you have gas process that are slowly inching up, people don't really notice it. But when it jumps up a lot, they're interested. So I think it's taking advantage of opportunities like that.

M: So current cost of fossil fuels is-

J: Or the concern. Or the future cost, or any crisis supply disruption.

D: One of them here is the West is water. We've had just this baking hot summer, and now we're out of water and it makes it easier to talk about water conservation.

M: Water conservation, but how about renewable energy?

D: Um, the amount of energy they're using on air conditioning, you know. All those kinds of things.

M: So what do you think about peak oil as a point of departure for getting people motivated?

J: I don't think it's motivational for most people.

M: Declining fossil fuel energy return on energy investment? The EROEI?

J: I think that is not a- I mean, they're not talking points that my stakeholders would respond to. There are a few people who get all riled up about peak oil, but they're the people who are already riled up about peak oil

K: Right.

J: And so it's more- the people who are interested in that are already the choir for Extension, I think. So I think you have to meet people where they're at, where they interface with energy on a day-to-day basis. And it's their pocket book-

P: It's got to be personal.

J: It's how much it costs to fill up the car. It's, um-

P: Did the luxury bill go up?

J: Did the luxury bill go up? Have they had supply disruptions? Now, if your audience is business, it might be a bit different. You might be talking about ROI and where can you save money and be more profitable.

N: There's a significant audience effect. There's also the- a few years ago, a friend got me to plug in this thing that would tell me how much energy my appliances were using. I was shocked that boiling water in the microwave was a tiny fraction of heating it on the stove, not counting the times I melted the teakettle by forgetting about it. But things like the microwave off, there's perks to the charge on it. [Energy use] went up. I mean it didn't take long to do that. People getting hands-on experience is that- [New thought] They did research, I must say, at the University of Washington. [They] allowed a selection of cars where you can hit a button that will give you your instantaneous miles per gallon. Nobody cares, because they don't feel strokes: "Okay, I'm on the interstate getting 40 miles per gallon even in my tank, eh."

M: Only when they're going downhill.

N: Jack rabbit- I'm jack rabbiting, and you know the jack rabbit started them at two [miles per gallon?]. "I don't want to see that." Getting people to- we've done a poor job

of user interface on that, helping people to see what some of these small effects can be. Again, the Vista [Power] guy was telling me [about motion detectors]; we put in those stupid things that we all hate [where] nobody moves in the room and the light goes off, but how freaking much energy that saves. The right turn on red in your car saves like a million barrels of oil, I mean-

M: The statistic I use in my one presentation is in 2006, Americans drove over 3 trillion miles in their cars. Just Americans. That works out to be 5000 times the distance we travel around the sun each year. That was just in one year, 3 trillion miles. And then in 2007, when we had the spike in gas prices, that dropped by about 93 billion miles and it was the [largest] drop in vehicle miles travelled per American since World War II. That's because of the spike in gas prices. They just [snaps fingers]. When it hit their wallet, they got a clue.

J: And for the most part it wasn't people who couldn't afford it. It was people saying, "Oh, well, this means I'm only going to go out to that side of town once a week instead of three days a week. So I'd better make sure while I'm over there that I'm doing everything that I need to."

D: Do all my errands.

J: Right. But as soon as it became less expensive to do that again, people were like, "Oh, well. Okay. I can make an extra trip out there. It's not as big of a deal." So right, I think it's price that raises awareness.

M: How about climate change as a topic to kick people in to the idea of people learning more about renewable energy and energy efficiency?

P: We talked about that at the other table.

M: Yeah, yeah we-

N: You'll still require- you know, you've got the people who have already made up their mind on either side and the other people who would rather not talk about it at all.

M: Right.

N: But maybe bringing people together to, you know, okay if we are going to talk about it, be the ones who are visibly the fair broker of this. Making sure-

D: Somehow get it across that it doesn't really matter *why* but it is extraordinarily obvious that it *is*. That you know, just let the- and that's really what Extension should be doing, in my opinion. You have to stay neutral. And you have to let your personal opinions and biases stay out of the conversation. If you could say that it is happening, then you could use that as your point of departure, at least around where I work. You might not get tossed out of the room!

P: But I don't think in Arizona if we said we were doing something on energy conservation and climate change we'd get a turn out.

J: You get the same people.

N: And in Phoenix, how would you know the temperature went up? [Laughter] It's already about the surface of the sun!

J: Wisconsin's the same. Temperature- the median temperature has changed a lot in Wisconsin. It's one of the median parts of the country that has changed the greatest in percentage terms. Still, if you get a program on climate change, you're just getting the

people who have already bought in or are already curious. Especially for energy, I don't think the climate change is a hook. It is in terms of resiliency to drought and-

M: Economics.

J: Economic resiliency, but climate change from an energy perspective, it's not right now, I think.

N: But with the term resiliency, which is a- economic resilience, social resilience- it's that a hook that would make sense? We don't care what the reasons are, there's stuff we have to deal with.

J: I think if we design a program that you could show the return on investment for the homeowner for installing solar thermal or solar PV, people will show up. Because if you can show them, "Yeah, it's going to cost you X up front, but here's your capitalization overtime," people are going to understand that. Business owners are definitely going to understand that. But if you tried to show that from a climate change perspective, it's like, "Whatever. How much carbon am I saving a year? Eh." Unless you can price the carbon, which doesn't happen right now but if there was a price on carbon credits, then oh boy. There would be people figuring out how many carbon credits they could be producing.

M: So it sounds like you're saying, J, an interest in renewable energy technology itself would be enough to bring people to the table, or to the classroom.

J: Well, it's either people who think the technology is cool, or you could show how it's going to save them in their pocket book in the long term. A lot of our-

D: Relating it to climate change-

J: Relating it to climate change is not going to get you more people. It's more of an, "Oh by the way…" Now again, if there was a price on carbon credits, then you build that into your model. And then it becomes even more feasible financially.

M: How about the issue of renewable energy being the…the autonomous nature of renewable energy? In other words, giving more control over to local entities over their energy decisions. Do you think that's a motivator? Anybody?

N: Well, there is certainly a group of people who like to- you know, somebody talked earlier about people who want to get off the grid, and I'm just tired of it. If I could be self-sufficient, in terms of energy, there's a certain appeal to that, if there's no risky downside to it. But I think there are certainly no shortages of businesses that have managed to be pretty much energy efficient. I think when you're Ford motor company, the only thing they made money on was selling their excess power that they generated. It kind of comes down to, what's in it for me? Maybe what's in it for my community?

M: How about the prospect of increasing prices in fossil fuels? Of future prices, not what they are right now but if people were somehow motivated by the knowledge that gas is now $3.50 a gallon but in five years it's going to be $5 a gallon, $6 a gallon?

J: I think people are too- they don't think strategically like that.

D: Too shortsighted.

J: And that they've seen gas prices jump all over the place.

D: It goes up, it goes down.

J: It goes up, it goes down, we don't have any idea; the average person doesn't understand or even want to understand what causes that to happen. That much we don't

have control over on a day-to-day basis, so if you would tell me that gas is going to be $6 a gallon next year, I'd say that no, it's not, how do you know?

P: If anybody told me 20 years ago that I was going to be paying $3.50 a gallon and going, "That's just the price of doing my job," I would've said 20 years ago, "Oh my god, there's no way I'd spend $3.50 a gallon!"

N: I'm old enough to remember when the gas station went up over a dollar and they had to change some of the machines! [Laughter]

P: Uh-huh!

N: Like, "Wait a minute, it's 50 cents for half a gallon?!"

M: Well, in Europe they're paying $5-6 per gallon of gas. Yet that's commonplace there. But they are also very keenly interested in public transportation and renewable energy. I mean Germany has more solar energy capacity than anywhere else in the world combined right now.

N: Well, it will be interesting now that the subsidies are- I was in Munich and said, "How many businesses do you have in Munich?" And [they] said, "Well, that's a difficult number." Because if you have a solar collector and you're doing metering, you have to register that as a business entity. I mean it's not so much inexpensive as it is a hassle. So we either have 40,000 business or 60,000. Germany increased their creative part of the economy by 25- er, sorry- they went from 4% to 19% in a year by classifying software as a creative industry.

M: How about the idea of environmental ethics being a motivator for teaching or learning about renewable energy?

N: Ethics.

J: What's that?

P: Hand-on…?

D: Dealing with children?

K: Yeah, if we start younger, I think it would work out better.

J: I think it's a values proposition. I think people don't like to talk about ethics in public. That's for big stone buildings that sometimes have them across the top.

P: And who's ethics?

J: Right, who's ethics, who's values? So-

N: Why, ours, of course.

J: So I don't think that's a driver for how to reach people, at least broadly.

N: I think it's a- it can be supporting because you want people to feel like they're doing the right thing. Part of this is that doing the right thing and doing the smart thing are the same thing. Like many places in life, it's being able to make that connection. Yes, it's great to be noble and feel good. You know, I am going to take my washable bags, the whole paycheck for my groceries and I'll drive 15 miles through LA traffic to get there as opposed to the corner grocery. It really doesn't pencil out but they feel good showing people. There's a lot of supplemental- it's not actually a bargain, environmentally. It comes back to what you said earlier, J, about educating, and what you said, Dave, about educating. Simply, people get the facts, they will figure out how to do this.

M: So before we leave this question, are there any other motivators to get people to learn about renewable energy that we might hit on?

J: The way that I try to reach people is show the business opportunity that it is. Working in a rural county, it's a cash flow opportunity for anyone, whether you're a farm, which is already a business: you have all this open space, most of it is not dedicated to anything that is actively producing profit for you. You put up a couple wind turbines and- you put up two turbines and you're making more on that than you're making on 100 acres of corn. So you know, that's how I try to reach especially rural landowners because they have the space. Many of them are already businesses in some sides.

M: But are those energy companies hunting down those farmers because of you, or? I mean, seeking them out to lease land, or?

J: No-

M: So you get them excited about leasing a chunk of their land for wind turbines, but if there's no energy company in their-

J: It's not for leasing, it's for their own- they put up their own turbine.

M: Oh! Oh, okay, for their own production.

J: Unfortunately the net metering law in Wisconsin only allows up to 40 or 50 kilowatts to net meter. After that, you're only selling it back for half of what you buy it for.

D: So you're producing your own energy for them to use.

J: To use or to sell back.

M: In Arizona, it's 125%. You can't generate more than 125% of what your assessed need is.

J: Oh okay. But there's examples in the county that I work in where they've- instead of selling the power to power companies in Wisconsin, they'll sell to New Jersey because

there's a big incentive for developing solar in New Jersey. So there have been entrepreneurs who put solar in Wisconsin and then they're selling it onto the grid to some other utility that's from out of state. It takes a pretty sophisticated business to do that.

N: Wait a minute; you're supporting the Jersey Shore?

M: The electrons get out onto the grid.

J: Exactly. So showing people how it's a business opportunity draws in people who have the capitol, who are going to be interested in doing it because most households don't have $10,000 sitting around to put solar on their house or they're not comfortable adding that to their mortgage, even if it makes financial sense. It's just scary.

N: Drilling holes in their roof to put a solar panel-

J: But for an entrepreneur or businessperson or a farmer, they're interested in seeing how they can cash flow their mortgage and taking risks. Frankly, most farmers have the assets that they can leverage. They don't have to put up a lot of cash. They have all the land and other assets that can be used as leverage, and they're used to these long-term investments. Twenty years? Twenty years is not a long-term investment to a farmer, per se. I think that's where it's at for my clientele, at least.

M: So, um, one last thing about these motivators, and we probably hit on some of the things that didn't have any merit in using [them] as a motivator. Is there any message that should be expressly avoided in trying to start up a renewable energy education program?

J: I think it's being very cognizant to your audience as to what the hot button issues are. Five to ten years ago saying that we wanted to get off Mid-East oil was a big selling point, to some degree, geopolitically. There were a lot of people who responded to that.

Now, it's not so much of a big deal. People don't respond to that right now. I think it's kind of out-lived its usefulness as a motivator. So, some communities are going to respond differently to different terms and different values, different rationales. That's why I try to use the business approach for a lot of communities because it's kind of neutral.

K: It's the safest way to go.

J: Yeah. But there are some people who are values-driven, and if you push the right buttons, they're going to act. But if you push those same buttons with a different crowd, you might not walk out of the door under your own power. [Laughter]

M: So to follow up on what you're saying here, J; you seem to have the most- within this table, you seem to have the most active level of programming around renewable energy than anybody else in the table. What is the current level if interest of your clientele in energy, period?

J: I think it's still pretty high. It's more difficult because the regulatory and incentive structure in Wisconsin has changed such that it's not as attractive or feasible to do it as it was a few years ago. That's frustrated a lot of people who maybe were just learning three or four years ago-

M: And now they're ready to do something?

J: Now they're ready to do something and they can't, the game has changed in terms of incentives.

M: Same thing in Arizona.

J: Or the game has changed in terms of how willing utilities have to be to play with you.

N: And there's an issue of regulatory uncertainty. In Idaho, they've been going back and forth, battling over, in particular, wind. Because, partly there were people who, let's say, really exploited the regulations, and the public utilities commission overreacted in response. Reducing uncertainty is the message. I was thinking it's not just hot button issues but just being stupid. If you're going, "This guy, he has no idea what he's talking about," or, "You're talking out both sides of your mouth so you're just telling me what I want to hear," is something we really want to avoid. But uncertainty reduction, I think, is part of the message. It's not quite, "There, there, it's going to be okay," but having the facts and understanding that if you do X, we're pretty sure you're going to get Y and making that case. And if the case is good enough, as J- I really like what J said about if I don't see that opportunity in my farm but J says, "Well, I can make a buck off this."

M: And I think that's one of the list of- in the list of motivators, we talked about the economics of things but we didn't get specific enough to say one of the motivators that I've seen is the prospect of rebates, government rebates, and utility company rebates. When people get an inkling that those rebates are out there, they want to learn more as to okay, well what can I do in order to get one of those rebates or make it affordable.

P: It makes me think of our alt-fuel vehicle fiasco. There was a state law that was written and you could buy vehicles that could have alternative fuel, pennies on the dollar. People were buying SUVs and putting a gallon tank in for an alternative fuel, and [they were then] able to ride in the carpool lanes and all that. All of sudden they [lawmakers] realized "this is a lot more money than we thought it'd be," and we thought it would be a bunch of people buying (and the Prius didn't exist then) the Priuses of the world and they

weren't. And it had to get shut down special session and all that but people, and they're legally doing it correctly, they were meeting the law, but they were all over it! So if we could have those kinds of things in a more conscientious way that had alternative fuel vehicles actually ride on alternative fuels, not just have access to it, you know.

M: So Dave, at your center, have you had any interest in energy from your clientele?

D: Yes. And naturally so because the house [Utah House] itself has some features and I think some people who are drawn to it and come visit and learn about some of the technologies or aspects, attributes of the house, and they think, "Oh!" And they start to explore some different questions. What we need- it's very hard to stay current with, you know, [information]. We tried for a while to say, okay, here's a list of contractors that will work on active solar wear. How do you keep that list current, you know? How do you get all of that stuff on your website? It turns out, it's much better to direct them to the folks who really help.

M: The organizations-

D: Yeah. I really like, as you mentioned, this convener/connector role; that's really what this little place is. It's a dissemination of information and physical demonstration of a bunch of different things that people can then see and realize, "Oh, this isn't as weird as I thought it was. I could live here." And then, you know, maybe go home and do something [about it].

M: Right, right. And you working with Ros, have you noticed an interest in her clientele for this kind of information, energy information?

K: I'm not working with her at all on energy, so.

M: No? On other areas?

K: Blake you'd have to talk to; he's doing energy, like an assistantship with her.

M: Okay. So question five is, what are the primary barriers clientele have in transitioning to renewable energy sources and why do you believe this?

D: Everything J was saying: cost, lack of information, misinformation.

J: Yup. I think in order, it's probably education, then there're artificial barriers. So our current political climate in Wisconsin is putting up artificial barriers to people who want to produce their own energy, where those barriers didn't exist a couple years ago. And then it's economics, which is related to both of the previous two. I think there are economical ways for individuals or businesses to go about producing their own energy. It's just a matter of understanding and being sophisticated enough to know how to use those vehicles, financial vehicles, whether it's including infrastructure in your mortgage, for example; then it's tax-deductible. Or if it's going into some community-developed solar or wind (which you cannot do in Wisconsin right now). I think it's in that order. It's education, it's the mostly artificial regulations that make it harder, and then it's the financial aspect of it.

D: So how do you reform- you know, I'm thinking of Utah in particular. 80% of the people in Utah live along the Wasatch Front. It's a very highly urbanized, congested kind of condition. But the rest of the 20% live out, far away. And these small county Extension offices could provide a really important role in giving meaningful information to some of these folks out in these rural environments. But how do you educate the rural county folk? And in some counties we have, I'm thinking there might be one person.

P: Right, I was just going to say, what's on their plate already?

D: And they're a traditional ag person or they're ranching or whatever.

N: Well I'll tell you what you guys did that pissed us off in Idaho because we couldn't do it where we were. Zions Bank partnered with the Wayne Brown Institute, who does technology commercialization. They said that there was a lot of pressure and they want to promote small business in our communities. In the space of a year, they went to every branch bank of Zions and they hosted a Saturday half-day to day event where they were saying, here's what it's really going to take to do this. You bring in big-time, national level experts, you have them in Utah, but they took them around the state. The bank provided the venue, the punch and cookies, some of them actually even charged people. There was a lot of learning: what messages are working and what are not. They went around and by the time they were done, they really had it cooking and were able to put together a bigger event at the end to bring the people who had taken the hook to get together. So it seems to me, whether it's the power company in the state or the banks, if you find enough people interested to sort of spread the cost, it didn't really cost that much for them to do it. And we said, can we do this in Idaho, and the Zions Bank in Idaho said, and I quote, "We don't want to be copy cats." [Snickers]

P: Oh god.

J: But I think-

N: But having these events where you get the leverage of that expert- we could find incriminating photos of J and make him go around all the way around these counties in Utah or Arizona.

J: Well I think the- you hit on something as important as the financing aspect. I didn't- I myself have not yet worked out a good relationship with a bank or lending agency that is super sophisticated or comfortable in energy but a couple of my colleagues have. And so once they have that relationship with a local bank, often times, who's done some of these financing projects, they're familiar with it. It's not exotic for them anymore. It becomes really that much easier because if the finance people understand it, you've eliminated one of your biggest barriers in getting a project done. Because even if you want to do it- you have your own capitol, your feel like you're capitalized, you understand the technology and you go to force to get the lending, if the lender's like, "Oooh, you know this is something I'm not used to," you could be done, right then. But if you've developed that relationship with the bank who's done a few projects, it's a lot easier. The learning curve is less. For example, we did a program in the Stevens Point area, which is right about the center of the state of Wisconsin, and a business there, which happened to be a brewery, a local beer brewery; they had developed a relationship with a lender over time just in their regular, typical operations. So when they came forward and said, hey, we need to build a new brewery, and oh, by the way, we want it to be off the grid and solar heated, and it's going to solar preheat all of our water and all this stuff, they [the bank] said, well, we're not really so sure about- we don't really know about- energy, but we have a track record working with you, so we'll do this. And now both the owner of the brewery and the banker, they get trotted all around that region saying it was a great opportunity for us, for our business. It was a nice thing to do from the environmental perspective. There was a

learning curve for the bank, but now the bank's going out saying, hey do you want to do this, do you want to do this?

K: That's really nice.

M: So it's a motivator!

J: So it's a motivator. So when you hear a banker come and tell you it's a good idea,

K: It's probably a good idea!

M: Would you, P, say the same for the farm bureau in Arizona? Could they be looked to that way, do you think? Helping ag producers getting loans to improve their energy efficiency on their farms?

P: I don't say it would be farm bureau; it would be farm credit.

M: Farm credit.

P: Yeah, farm credit, definitely.

N: And they'd have a lot of fun doing it.

J: Energy projects are typically fun projects.

N: I mean, what industry in the world has the highest percentage of businesses that are closed loop, no waste? [Pause] Beer. I think number two is wine. There is a god! Sorry, Utah's probably not the place to say that. [Laughter] But the fact is, this is fun stuff. Because you go to a brewery that may tell you, we are zero waste. Everything is solar, we are completely off the grid, and they're off the grid because they're in inner city Cleveland. The gang members won't mess with them, because even the gangs think it's cool. They don't rob the people. This is fun, fun stuff. I mean, I kind of want to figure out how I can use a bicycle-

M: Okay, in the interest of moving along-

N: Sorry-

M: We've only got a couple more minutes here, I think. Does your county have roots in fossil fuels, natural gas, or nuclear energy production? Is this [group till] 4:30 or 4:45?

J: 4:45.

M: Oh, okay. We've got some time then. So again, the question is, does your county- not your state, your particular area- have roots in fossil fuels, natural gas, or nuclear energy production? And could any one of these be causing renewable energy to be perceived as a threat among clientele? J!

J: The county that I worked in for four years, no, had none of those. The only generation energy we had in the county was renewables, relatively new renewables. Not industry-scale renewables. It was like half an acre of solar and a few wind turbines. But other parts of the state, there's both love and hate because of the existing generation. We've had a couple coal power plants shut down recently and they've been converted to biomass. So burning wood, primarily; wood waste. Highly politically controversial project for the University of Wisconsin: most of our campuses have a co-generation facility on them, so they produce- they burn coal predominantly- they produce electricity, but really what they were developed for was district heating. So a lot of these plants were out of compliance with the EPA and they were on a campus and they were still operating like that for a long time. So in Madison, they have two heating plants: one's natural gas, relatively new; one's coal, turn of the century, really dirty. A previous governor said, oh we're going to be experimental and do biomass; we're going to convert to biomass. The

new governor said, nope! Don't like biomass, it's going to be natural gas. So now it's natural gas. We're also de-leveraging capacity. So we're using less energy for whatever reason in the state, so one of our utilities is bringing a nuclear power plant down. They're decommissioning it. So, for that part of the state, they're seeing all of these high-paying jobs [going away]. Gone. So you're a nuclear engineer, what are you going to do? Move, essentially. And so-

M: Move to North Korea. [Laughter]

J: So you know, we don't have any coal or natural gas or uranium or any of those things is Wisconsin.

M: In terms of extraction. Just use.

J: Yeah, all use. So, what do we have? We have cows. And methane waste and biomass, and some renewable energy capacity. So it's an easier sell from an economic perspective because you can source that locally. That's not going to be the case especially in Western states.

P: Our county is nuclear and hydropower. We didn't even say hydropower!

M: Right.

P: And then we have a coal fire plant that we get our electricity with but it's in a different county.

M: Because of those production levels in Maricopa County, do think because of the Palo Verde nuclear plant or any of those other production that those pose a threat to clientele- or are perceived as a threat?

P: Are people worried about it? No, they don't think about it.

M: They don't care about it. They don't know where their electrons come from.

P: I don't think anybody- it's new to the valley. I don't think APS [Arizona Public Service] has a nuclear power plant. Those of us who experienced them building the plant all know about it. But I think anybody new to the county (which is probably two-thirds of the population, because we move in and out) probably don't even know it's nuclear.

M: So those who do know it, how would-

P: APS is also doing solar.

M: Right. Exactly. In Arizona that's the thing our utility companies are heavily involved in getting renewables up and running because of the statewide mandate of 15x25 [Current Renewable Electricity Mandate: 15% of electricity generated by 2025], which is pretty wimpy, in my opinion.

N: Does Abengoa have a utility in Arizona?

P: Who?

N: Abengoa [Abengoa Bioenergy]. They've taken over a couple of the energy projects near us. They're actually Spanish.

M: So- I think it's the one in…Gila. Gila Bend. It's a Spanish company but it's not Abengoa.

N: Well, it could be one of their subsidiaries. Outside of Seville, there is an ungodly array of mirrors.

M: Yeah. Well the world's largest concentrated solar project is being built by a Spanish company in Gila Bend, Arizona as we speak. 285 megawatts.

[N talks over M and P; their conversations are simultaneous from lines 675 to 681]

P: So is that different from the APS facility or is that *the* APS?

M: That is APS- well, the APS facility is in Red Rock [Yavapai County, AZ], but APS will be buying the power from the landowner.

P: Hm. Okay.

N: And the mirrors reflect the light- molten salt- and it's the eye of Sauron, I mean you can't look at it. But mirrors are cool. Which is a problem because birds can land on it and poop on it but Abengoa is- I went to their- they do this in California and a biomass project in St. Louis because a US company just screwed up. And they said, okay, we can run this better. And they're getting a lot of PR simply because they run it better. In Idaho, we're heavy in hydro because it's so cheap. And it's kind of- the dams are cool, and you know, Evel Knievel's jump was near our biggest one. And they're going to do another one!

M: Okay-

N: And nuclear- we don't have nuclear facility but we have the lead lab for the Department of Energy on nuclear. And they are also- that lab is heavy into alt energy. They're doing amazing stuff. They've been very supportive of it while public utilities have been ambivalent. They are worried that somehow this is going to screw things up. [PA announcement]

M: Okay, let's see. He told me that he only needed to get up to six. We have three left but he didn't care about these last three as much, he said. Um, let's see. I think we've talked about- we didn't talk so much about targeted audiences for our renewable energy program efforts. And I think this is a fairly obvious question. When marketing renewable

energy technologies, should there be a difference in presentation to those that are urban versus rural?

J: Yes.

P: Yeah.

M: Okay. I would think so too.

D: I was looking at- Rocky Mountain Power, which is owned by Scotch Power I believe, is the main power supplier here in Utah. They have a cool program called Blue Sky, which- have you heard of it? It's renewable- it's wind power from Wyoming, basically. That you can buy. You can opt in, and they're pretty progressive. They have a-

P: I've heard of "Blue Sky" in the air quality side, so it's probably something totally different.

D: Um, they have a customer generation opportunity: electric vehicles, a whole bunch of things. Does Extension ever partner with the utility itself?

J: Oh, yeah.

P: But he's saying in Utah.

D: I'm thinking in *how* could I? The very big downside is where our center is. It's like an island. The local community, local municipality, has it's own power utility, so we can't play.

J: Are you talking about Logan?

D: Logan does, but the little town in Kaysville. So both places, where the main USU campus is and where the Botanical Center is.

J: In Wisconsin, our municipal-owned utilities are our biggest ally, because they're the ones who are more nimble when you invest in your own utilities and they're more values-driven.

D: I wouldn't say that's true where I am. In Kaysville, it's like the Dark Ages.

J: Our municipal-owned utilities in Wisconsin are predominantly smaller municipalities. In terms of the percentage of energy that they get from renewables, it's probably double or triple the utility because their local citizens demand it. And so, they're a little bit more attuned to voters, where municipal utilities are like, "F-you, voters!"

M: So you invest your own?

J: Yeah, you invest your own. They don't care about voters because they're only reporting to their investors. But municipal utilities are not. Their boards are either elected or appointed by elected officials, so they're big allies in terms of both education and also investing in renewable energy.

D: That's an interesting little niche though, where Extension can make some connections.

J: Yep, so my colleagues who work in communities that have municipal utilities I'm a little bit jealous of because they work hand in glove with the utility, where-

M: Otherwise you're going up against the monolithic [investor].

J: Yeah, otherwise the "invest your own" utilities in Wisconsin, at least right now, are just like, "Whatever."

M: So one last question, which I think will take about two seconds to answer. When marketing renewable energy technology, should there be a difference in presentation to those that are youth, adult, and senior?

K: Yes.

P: Yeah.

M: I would think so, too.

J: No. Adult and senior probably not any different but-

M: Adult being 20-35, 35-50, 50-65, and seniors being 65 plus.

N: Well the implication is that we're dumbing down for kids. Don't.

P: No! No, it's different values. They-

J: I don't think it's dumbing down.

M: I don't think that's the implication at all.

N: Okay but-

P: They may not have control of their life, so we educate them in the sense (I'm thinking K-12) that, let's educate them in the sense that these are conversations you can have with your parents because your parents are going to make that buying decision, not you. Until you get out of the household.

N: Okay, alright.

D: Seniors are often on a fixed income.

P: Yeah.

D: That's the thing that occurs to me that may be different.

M: So the economics would be really important in some kind of renewable energy program for the seniors because of their fixed income.

J: They may also be more values driven. They're more- I've found that they tend to be more responsive in what's best for the next generation, even than adults that have kids

presently are. For some reason, once you get to that point in your life, it seems that people are more reflective.

P: Mm-hmm.

M: Unless it comes to paying property taxes for schools. [Laughs; everyone laughs at the comments made from here to the end of the interview]

P: Right, right.

M: When my mother started bitching about that in her 80s, I thought, wait a minute. Aren't we all in this together?

P: "Somebody paid for this for you!"

M: So much for the values, you know? Right out the window! "My kids are gone, I don't care anymore!"

P: But I agree with you because I'm at that age. I don't have grandkids yet, but I keep thinking about what are we leaving my grandkids. I need to step it up, you know!

N: Because they're the ones that are going to pick out your nursing home.

P: Uh-huh!

M: Alright, well, I think you guys all did a great job. This is all data for Blake. This is for his thesis, so I think he got a lot of good data in here, especially from J. All right. Thank you everybody.

Energy Focus Group #4
Extension Sustainability Summit – Newpark Resort – Park City, UT
Wednesday, October 2, 2013 (45 minutes)

M: Okay, I'll get some of the details out of the way. Everyone does know that this session will be recorded. Your confidentiality is protected. This is just so Blake can best gather some qualitative discussion.

K: My name is [Name withheld]- [Laughter]

M: Yeah, that's all right. We can't confuse everybody.

K: That was unclear!

M: You know, if I do not call you by name, some of you have the disadvantage of a lanyard dangling down there, so I-

K: You don't want our names? You do?

M: That's right. Well, if you want to address back and forth. Uh, I am supposed to thank you for your time, which it is nice we're able to continue to a discussion that segues into a research project. This is integration of Extension into academic endeavors; this is perfect!

K: A debate and switch.

M: It is, I tell ya. This is part of a thesis and it will be distributed just as it was distributed to the attendees of the national Extension energy summit, which was last May. And you can ask Blake or Roslynn if you have any questions. Okay, so what state and university are each of you from? I'll start, as the facilitator. I'm [Name withheld], and I'm from the University of Wyoming.

D: [Name withheld] from Clemson University.

K: [Name withheld], University of Wyoming.

I: [Name withheld], University of Idaho.

G: [Name withheld], University of Arizona.

T: [Name withheld], University of Wisconsin.

M: You know, I should just have combined all of these, my apologies. So now let's address how long you've been with Extension and what are your roles. I have been with Extension for about four years, to join a point with the school of energy resources, and I deal primarily with energy issues, be it fossil fuel development, small-scale renewables efficiency and what not.

D: I've been with Extension about 20 years, eight years in my current post. I work as a community economic development specialist. I work in new and beginning farmers in fruit system development. And black soldier fly larvae production and economics and all kinds of strange things.

K: Um. So, I am technically not in Extension. I have a research appointment, and I've just collaborated on projects with Extension. I've been working on sustainability stuff since 1998, and so various interactions with all different sorts of stakeholders, energy and minerals and now, more specifically, rangeland.

I: I am working on community and economic development. Agriculture, natural resources education, and youth program development.

G: I do Extension in climate and natural resources, and I work primarily with natural resource managers, urban planners, farmers, and ranchers.

T: I've been with the University of Wisconsin, what-

G: Three years?

T: 27 years. Started when I was three. I'm a state energy specialist with a joint appointment as a professor of finance. I work with developers, bankers, policy makers, attorneys, technology firms. My home is with the program of community resource development.

M: Very good. Pretty diverse group here, as we would expect.

K: And we have the Doogie Howser of Extension, it's awesome! [Laughs]

M: That's also a bonus. Um, okay. So the first question: does your state's Extension service offer renewable energy outreach? If so, what does the outreach look like? Comprehensive, fact sheets, guide interested clients to online resources? And is it offered at a county level?

D: In South Carolina, I would say that there are research projects focused on renewable energy and little a bit within the Extension ranks, but very little. Very underdeveloped.

K: Is it fair for me to give that question back to you? Because I really have no idea!

M: Sure. Yes, Wyoming has a wonderful renewable energy outreach program [said sarcastically]. No, uh- we do have a program joined with the school of energy resources, and it is offered at a county level, attempting to gain county educators.

I: U of I is involved in the multi-state biofuels project, but as far as Extension, I don't know of anything statewide on renewable energy, but there may be something and I just don't know about it.

G: We have one specialist who works on energy issues, and I believe he's been focusing on statewide. And we also have a couple of Extension resource economists who work on water and energy issues.

T: We have a ton. From Coney to integrated campus, across the campuses; we have 14 campuses, um, and many different levels. And we don't have half the renewable resources as some of the other states.

M: If you could quantify "a ton."

T: Um…[counts] six state specialists, four renewable energy teams, bioenergy, sustainability, energy efficiency, and there's a lot of cross programming between clean air programs and we have a solid waste center. Even the center for community and economic development does renewable energy programming. The center for local government education does renewable energy programming. I do the teaching for a lot of that, but yeah. It's pretty much intertwined across programming areas, from 4H to family living to ag to-

G: We do that through other mechanisms, not through Extension so much. We're just starting to do that through Extension.

T: We have flexed our muscles because we also have a federal lab in the Great Lakes Bioenergy Research Center, located on our campus. And we basically have flexed our muscles and said if it's an instate application of what you're doing, we're the lead. Outside the state, you do whatever you want. But in the state, we're the lead.

M: Okay, well if we could just give a general trend, do you think you'll see more emphasis placed upon the future? And by the way, you could address things like

reclamation and restoration. More emphasis or less emphasis in the future, fully cognizant of budgets and everything else?

D: It'd probably be more.

M: More?

K: I would say more.

I: I think that we could do more. [Laughs] I don't think we could do less than more!

M: It's good to start from a small base, it's not like solar energy's been growing in triple digit percentages in the last-

I: I'm not familiar with what's happening in southern Idaho and they do have wind farms down there, so Extension could be involved in that. I just don't know.

G: Well we could do more, and I'd say we're on the road to do more.

T: We'll do less. [Chuckles]

G: Are you retiring, or what?

T: No, um change in the environment and governor's office. We'll do less.

M: Fair enough, we've all heard about that one. And I would actually say Wyoming would do about the same. I don't anticipate new resources emerging. It would purely be based on greater interest from county educators.

T: It's okay to say you're sorry. [lines 102-104, out of context joke at table?]

I: I said it with my paper-

T: [Laughing] Yes, you did!

M: And that can't be noted on this, so. Okay, what do you perceive Extension has to offer in energy programming, given the role of public utilities, electric cooperatives,

USDA, Department of Energy, and state energy offices? This sort of gets at one the earlier questions. What's our niche, I guess? Or is there a niche? It's okay to say no, by the way. It doesn't always have to be, there's one other thing to do.

D: I think one of the things we discussed at our table earlier on that was the fact that Extension has a long-standing presence with a number of important constituencies out there. These state-level offices may not have the mechanisms or experience reaching effectively. So whether that's household, consumer-based kind of audiences, whether that's ag producers, natural resources folks; there are some constituencies out there that we've worked with. Long-standing, we're perceived as being unbiased; we have credibility. We can play a partnering role.

K: We talked about a lot of the same things, and we also said if Extension doesn't know the answer, they'll know where to go to get the answer, which might be more than the constituencies know about them.

I: [Pause] Oh, um. I would say education for energy efficiency through 4H Extension reaches a lot of kids. That'd be where I would put my focus.

G: I'd say this is a big job area for us because there's a lot of solar energy going in in Arizona. Large-scale solar but also distributed solar, things like that. We have- Extension has a particularly strong niche in the rural parts of the state, and I think the issues there would be with energy security and any town you go to, there's some small, local left-wing community that wants to have solar panels on every home, something like that. It's a big base for education and small-scale projects.

T: For us, our focus is on two core areas: business trade groups and trading the executive directors, the memberships of business trade organizations. How to evaluate, objectively evaluate, energy options. The other big audience is the municipal governments and the economic development corporations on how looking at renewable energy is part of their platforms. We have a rather robust municipal utility industry, and we have a very aggressive economic development organization and we're looking at combining heat and power and district heating systems for industrial parks, and zero waste. So we leverage our different centers to target those audiences. We don't do a whole lot of retail-level renewable energy education. So not so much at the one-on-one residential basis. More looking at industrial and local government audiences.

M: Very good. And I would just add for Wyoming that the research base is quite important. Recognizing some of the quality information that comes out. Instead of getting regurgitated, it's an opportunity for Extension to really say, "Okay, we have done our job on certain renewable energy programming, and if you listen to us, then you can make an informed decision and say 'I do not want to do this,'" as opposed to other entities that would measure its success by saying "we went out and this many people installed solar panels." I think that role can be a niche for Extension, as opposed to utilities, which have their own agenda and any other entities that are listed there.

T: Let me add one little addition: we recognize that an emerging trend, or market driver, is in bio-based materials, not energy, but bio-based chemicals. We have a huge footprint in that space, in terms of our pulp and paper industry and food processing. So we're

working closely on helping a number of candidates look at making the conversion away from paper to bio-based chemicals.

M: Okay. Now here is a bit of a broad discussion about what it would take to motivate people to learn about renewable energy. We can add things along the line of- I'll tell you what, let's just quickly go around and see what people think about these particular items. If you gave messaging about peak oil, would it resonate? Are we familiar with the concept of peak oil? Okay.

D: [It would resonate] With some people.

K: In Wyoming, I think yes.

M: Okay.

I: Can you restate the question?

M: Sure. What would it take to motivate people about renewable energy?

I: And what was the section about peak oil?

M: Uh, would messages about addressing peak oil drive people to want to learn about renewable energy?

I: I would say, maybe some people.

G: Maybe one-third to a half.

M: Okay.

T: Not a chance. Those who already know about peak oil have already self-taught themselves. The rest of our audience, no.

K: And what was the first question again? I'm sorry.

M: Okay, what would it take to motivate people to learn about renewable energy. And, facilitator's prerogative here, I would say no. One of the things- one of the most painful graphic's I've seen is of wind turbines saying it [wind power] offsets this many barrels of oil. In this country, we really don't burn oil for electricity anymore, so they aren't substitutes. So I don't think it particularly resonates with people. They care about peak oil in the price at the pump, not the concept as a whole. [Moving on to new prompt] Another issue: declining fossil fuel energy return on investment, which means that we have to, for instance, invest more energy to extract energy. It's code for saying that our easy plays are already exhausted. For instance, if we go into Wyoming, we have huge coal seams, but guess what? The coal seams that we're going after now are a little bit deeper. There's more of a burden on it because it takes more energy to get to it. Is this something that would resonate with people to learn more about renewable energy? [Pause; M speaks to D] Sorry to make you always go first! [Laughs] Oh, I'll switch it up. T?

T: Are we looking- from my perspective, those people who are aware of environmental and macroeconomic issues about energy are already out there. They're self-taught, they're aware, they read, it's of interest to them. Attracting new audiences to that topic, a lesser use, no. Um, I'm in agreement with your earlier comment. If it's reflected in the price at the pump or the price of the electrical bill, they're interested.

G: There might be some 10%, the kind of person motivated by that message.

I: Yeah, I think that people will be motivated if they can have a financial benefit, especially in a community where people don't necessarily have a lot of money. Or maybe when their refrigerator breaks they don't have a lot of money, and so they have to go buy

the cheapest refrigerator or get a used refrigerator from their neighbor. So it's not going to be an energy efficient one. But if you could offer incentives that when you need a new refrigerator, swapping out- you know, just like they do with the light bulbs. You could go exchange all your light bulbs for free, cheaper light bulbs. People would come, do that and learn about how, [about] something that you wanted to tell them. That's kind of how I see it; it's like the price at the pump thing.

K: I think that that's a fair point. I think that's maybe going to be the same for a lot of the things on the list here. If it's something people can connect to personally and financially, then yes. Otherwise, maybe not so much unless it's just random curiosity.

D: I think that's all true but I also think that tragedy of the commons prevails on this in that maybe if we all acted simultaneously somehow on some these issues, we might make a dent in the situation. But us acting individually, we think, "Eh, it probably isn't going to help too much." And really the impact on me as the individual isn't that extreme. "I'll pay another nickel for my gas," or whatever it is. It's got to be translated into messages that these people could pocketbook, for one thing, fairly short-term impacts. Longer-term impacts, it's really hard to get the general masses engaged on those things. So, maybe the leadership can be convinced, although they aren't necessarily beholden to the masses who will not make this change for the short term.

M: And I would actually- the economist in me says this cost is already in the market. You know, it should be- the embedded energy is reflected in the added price from when Exxon or BP goes and gets it out of the- 20,000 feet down the Gulf of Mexico. They wouldn't do that if it were $1 a gallon but they will do it when it's $3.20, so I feel that

that's already in the market. And that leads us actually into cost, we'll combined two here: how much people care about the current costs, and then down the road, the future cost of fossil fuels, five-plus years. How much does that matter to people if you want to, once again, motivate them to learn about renewable energy?

T: That's the motivator in my mind.

M: Okay.

T: A good part of my programming is to teach the CFOs (Chief Financial Officers) how to evaluate energy switches and investments in efficiency and renewable energy. And if the teachable moment is achieved, where they can make the recognition that a renewable energy plan for them is a risk-management exercise, I've got them over the hump. Once they can begin to quantify their interest in renewable energy in terms of risk management, something they can plan around over the future, that's not only a teachable moment, it's a teachable accomplishment for the-

G: [Pause] I don't think I have a good answer.

M: That's a fair answer here.

I: I guess I would just say I think it's a threshold question. Up to a certain point, no, and then past that point, yes.

M: That's also fair.

D: I like that response here. That works at the CFO level. That's one thing I wonder about other people out there who are making individual choices, for example. Maybe at the household level or in a small business, that sort of thing. I wonder how they might play out there, differently than they might in a larger organization.

T: The CFO may be the brother who runs the books on the ranch, okay? It doesn't have to be in a glass office.

D: Okay.

M: And I would argue that costs do matter. It's easiest, it's the most diagnostic way to talk about renewable energy, to compare it to alternatives. I think it matters what you see it as now and what it is in the future. We also have to recognize people gripe about energy costs a lot but most of us won't even notice if our electricity bill went up by ten bucks because we really don't know what our utility bill is and how much of a proponent is actually energy charge versus whatever other charges the utility has on it. So cost matters but perhaps not on the individual level as much as we'd like to because, shall we say, the transaction costs are very high, to even evaluate for that. Well, we've talked about climate change so we'll skip that one. We've also sort of addressed general interest in renewable-

D: Wait- let's not talk about- because there was a news story, what- two days ago? A meteorologist from San Francisco/San Diego, something like that- he traveled 75,000 miles last year by air and when he saw the most recent IPCC report, he said, never again. I'm not going to travel by air. And it made writers, it made AP whatever- and they broadcasted it. That's one individual, okay? But I read it. But maybe there are ten other people who read that. And that was a very dramatic statement by somebody who loves to travel and he's a climatologist, he's a meteorologist. He's not an uninformed consumer of those energy dollars, CO_2, whatever. That to me made an impact. I do think climate change is on the radar, and I think it's increasing. I think the polls will back that up. It's

not so much climate change; it's climate uncertainty about what that change may be and what adaptation wins. And heaven forbid that if we have another drought like last year, you know if we have a couple of those back to back, our entire grain-based agronomic system is at risk. Seriously. If we have similar droughts- and I think the general populace gets it, but it's an inconvenient truth, barring the pun. Okay? But it is. It's an inconvenient factoid out there. They don't want to deal with it until it shows up on their energy bill or at the pump or they can't get their avocado that week.

M: And it is certainly an externalized thought. Do any other folk want to chime in on climate change? Or was it recorded at the other table?

I: Well I thought of another thing on the last topic, actually-

M: Oh, by all means-

I: But, um, I was just thinking about youth and technology and the expectations going up of being able to, you know, control your thermostat at home from your phone. So the smart technology just coming down the pipe and it's just going to be a natural way that people will be- it's not like you have to motivate people to do that. It's just going to be like I expect that from my phone, you know. So and then the climate change- I'm sorry, I'm like one step behind on the topic- are you saying that because when we were at these other tables we talked about climate change?

M: Yeah, yeah I'm not downplaying climate change; I was just trying to condense to make sure we got- if you have something else to add on climate change, does that motivate people to learn about renewable energy?

G: A small segment.

M: Okay, a small segment?

K: I think it depends on which state you're in and the context that it comes up in. I think the reaction is really, really different. And it's even different in an education setting versus a political setting, as far as where you're going to go and what you're going to do with that without *really*, really, really suffering some maybe unanticipated consequences that you're going to take after that from an education perspective and all of a sudden…

D: I think the constituencies in each of our states are out there that would benefit from us growing in a number of different directions. I just think our institutions, though, have more or less confidence in stability with that. We're set within an institutional framework such that we can- if we do something that's based upon science, it's somehow an objective to someone else. And can our institutions withstand that? In some cases they can't. In our particular case, I'm not sure how well they would respond to that.

M: That's a fair assessment. I guess climate change- I think it helps when it's "I," if you will. I don't know if I could go out and get it to resonate, particularly, just based upon that. But if we're talking something that's of comparable economics we can bring it over to balance, to say well it's obvious that solar compared to combusting coal would have a lesser impact. Now how about another interesting component: the autonomous nature of renewable energy. How much does independence matter to folks? That it's local, that it is a chance- you know, it's like growing your own tomatoes.

K: You mean in terms of motivating them to learn?

M: Yes.

T: So there would be- I draw that demographic profile into one camp, [which] owns an automatic weapon, and another camp, [which] doesn't own an automatic weapon, and they'd have different motivations. Independence? Yeah, yeah. I think going off the grid- I mean, I'm nuts. I'm not going there! [Laughs] Distributive generation is an interesting- and the policy in Wisconsin, the policy in a lot of states, especially regulated states (as compared to deregulated), that's a real important educational topic. Can you do your own and how does it work.

M: Anything else to add onto independence?

K: I think another thing is it's coming and people will learn about it when it gets there. I mean it would be neat if we could push that envelope but-

D: So I think the- this goes back to the cost thing, too- what you were stating about how people don't really know what the energy costs are. It's not clean data, transaction costs added in to be figured out. But if you start having issues with the power grid or whatever, (some regulated areas, like what California's faced and things like that) then all of a sudden, it's not the frog warming up slowly in the pot, it's more the "jab-run" [hit-and-run] kind of change thing and people pay attention. So if the distributive systems continue to supply power and whatever in a consistent manner, it's not going to be of much interest to people. If we have more problems, it's going to be of more interest.

G: In Arizona, it depends upon how visible it is. For example, we've got this huge coal power generating plant that is the major source of power for getting water from the Colorado River to cities hundreds of miles away. And there's a lot of- that's been in the news a lot lately and it's because the power plant emissions pollute the visibility of the

Grand Canyon. That's sort of an iconic issue. So people far away in cities, very far away [from the power plant] like in Phoenix or Tucson, get it about the power plant and they'd like to try to make the power plant go away. So you know, there are those kind of issues. And it's like you were saying. In a way, it's in your face.

D: I mean, if we talk about [it as a] terrorist target: they could shut off water supply to Los Angeles.

G: To millions, exactly.

K: Well we talk about the power grid all the time, how it's antiquated, and it's an easy, easy target.

M: The most complex machine ever built.

G: Yes. So that- you know, I think another issue, especially in the southwest, that has gotten people's attention with regard to energy in general that I think has turned opinions for some subset of the population is this water-energy tradeoff. And nobody wants to use extra water to generate energy. There's a whole lot of focus on trying to use the most water efficient energy technologies.

M: Absolutely. The water-energy index is something else that ties into ag as well. In the interest of time, we'll move along. Please explain the current level of interest your clientele have in energy. We sort of touched on this already but perhaps for the sake of quantifying this qualitative discussion, perhaps say, you know, put it on a Litmus scale from low to high. Is it fair to go this way again? [Indicating direction of speakers around table]

T: Medium and decreasing, in Wisconsin.

G: I'd say medium to high.

M: Okay. [Pause; speaks to I] Pass? [presumed yes]

K: I think that while they haven't- kind of a medium to low interest. If there was an impression that the cost was going to be increased exponentially, I think the interest would increase right along with that.

D: Medium-rare.

M: [Laughs] Good choice. And I will go with low, but increasing. Primary barriers clientele have in transitioning to renewable energy sources and what leads you to these perceptions?

T: We don't have enough time for me to respond to that one. Um-

M: [Jokingly] Do you have a bullet list then?

K: You are welcome to take my time too, because I think your answer will be more interesting! [Laughs]

T: Ownership structure, tariff rates, jurisdictional transmission issues; I mean, I could go on and on and on. There are lots of policy hurdles for energy changes in, not just Wisconsin, but most regulated states. States who have regulated utility structures.

G: Yeah, so at the household level, I would say that one of the biggest impediments is cost. And going up the scale to utility level- a lot of that has to do with the power of the state's corporation commission, which has just switched from renewable friendly to renewable unfriendly. Renewable hostile! So there's a political impediment there.

K: I guess I would just say with agriculture codes, the biggest impediment may be that they want to do what they've always done. Very, very, very traditional, set in their ways.

They'd have to see their neighbors doing it to see that it was better for it to really make an impression and even then, it might not.

D: Remember that crooked line thing we had up there earlier, it was chaos on the left-hand side?

M: Mm-hmm.

D: I think it's because of something like that where, you know, at least on the individual level where neighborhood or community or something like that, think about new technology, which there are too many unknowns for. There's the upfront cost, the maintenance cost, and they don't want to get stuck with something that hasn't been tested, such that it's become kind of a steady state, uh-

M: And in my order, I would say the upfront cost, regulated utilities, and then also, we want to talk about smaller things, it's once again, just too little improvement to care. 20% of your electricity bill isn't worth your investing a lot of time to offset that. [New question]. Does your county have roots in fossil fuels, natural gas, or nuclear energy production? Does this cause your clientele to perceive that there is a threat from renewable energy?

T: No.

G: Uh, no. I think it's an advantage. A potential advantage.

I: We're mostly hydro, which is already considered somewhat renewable but there is a carbon effect, I guess, from the large reservoirs, so.

K: I don't know.

D: We have coal and nuclear. It's not coal that people talk about, but the nuclear plants near it. Thus I don't think it's a threat. It's just such a small part of the overall market that I don't think anybody is going to see it as a threat.

G: So what- is it okay if I add a little nuance?

M: Sure.

G: It depends, in our state, it depends where you are. If you're in one of these areas, particularly the western part of the state as you get towards the Mohave Desert, you're getting five inches of rain a year or something like that. The county commissioners in those see solar energy as a moneymaker, and we want to bring in jobs and industry and revitalize the economy in what have been, by and large, very poor counties. If you go to let's say Phoenix, Phoenix gets most of its energy from a nuclear power plant down the road and I think that would be seen as a threat.

M: Okay, and in Wyoming, I would say yes. Especially with the recent challenges to coal. Okay, what groups should be targeted for renewable energy programmatic efforts? Talk about youth or general or all the fair effort. Where would you like to see it targeted?

T: We're already doing it with trade associations and municipal governments and municipal utilities.

M: Perfect.

G: I would say municipal governments but also communities and neighborhoods. There's a lot of talk about that in these neighborhood waste distributed solar facilities, things along those lines. I know in Tucson, within our city government, there's a lot of effort to try to get our public utility guild to- um, what's the word I'm looking for? Basically-

T: Buy out?

G: No, no um, *generate* more of their energy using renewables.

I: I guess I would say, identify the audience where you'll get the best return on your investment, in terms of prime in dollars. But where that would be specifically, I don't have an opinion.

D: I think all audiences are fair game. You message one, you know, the kids' view, the 4H; that's an area to target. You want to target them, message them the same way you're going to propagate to municipalities or whatever. And I wonder about- along your lines, some of these neighborhoods and stuff- what about planners and developers, Green Building Council, places like that.

G: Yeah, yeah. Sure, of course.

D: Not all of us, of course, are going to be interested, but those who are: getting the right kind of ideas and technologies to them might all allow them to do something about it.

G: But a lot of them are pretty well educated on those issues. The Green Building Council, in particular: they know of a hell of a lot more than I do, for sure.

D: But participating along with them: maybe it's harder to bring it back to other groups.

T: We're talking about- primarily, we're talking about electricity in our discussion today, okay? We didn't talk about thermal power, and in my state in particular, thermal is 34% of the energy dollar in a year. So, because we have so much manufacturing and because we're coal-weathered, one of the big issues is how power production is generated in distributed generation, on-site, and who owns that system. Because the electrical industry is formed by three different entities. You have gen cos., tran cos., and dis cos.: generation

companies, transmission companies, and distribution companies. And if you live in a regulated area, that distribution is their regulated monopoly. Tran co. and dis co. are not. But- I mean, tran co. and gen co. are not. That dis co. is. And so when you get into developments- neighborhood developments, industrial developments, planning and knowing the rules of that game? Oh my god. If you're in a deregulated state, like with Texas, Arizona's deregulated, California's deregulated to a degree. Those rules are crucial. So I'll come back to, D, what you said earlier: all audiences are eligible. In that context, I think you're right. All audiences are eligible to know what the rules of the game are about energy. And I do think that's a very important role for Extension.

G: Just a- in the southwest- well, there are other parts of the country- but anyway, a special audience for us is tribes. And you know, they've got a big stake in trying to provide power to really isolated populations. And renewable energy is one way to do that.

M: Okay, and then we'll close with a- we'll sort of sandwich these two together. How can renewable energy programmatic efforts connect with Extension's traditional audiences and what would that particular effort look like? [Pause] I can start if you want. I think that energy fits into any of the sustainability brackets that are couched in this event, but there is an energy component. I think if people just recognize that, then you can have energy programming with local foods folks. You can talk about energy with range folks. There're little niches that will come into play there. I think Extension better stick with what it's good at, and that is providing a research-based resource with a face attached to it.

D: I think there's some risk that I see in this. In that this is a specialized enough field and not every state has specialists on hand- it's pretty spotty, from what I've heard around here. I don't think we- we have maybe a few people who know something about this, but they may not know enough. So in terms of, say, county-based staff in the absence of a good specialist or something like that to make sure the programs they put together are on target and delivering the right messages, I think some thoughtfulness needs to be given to maybe it's the national level, maybe it's the regional level across the country, to assembling the people who are the experts within our system and then reaching out to others. To help craft those messages to our traditional audiences, and allowing the states to participate in that, as a multi-state effort, perhaps. Just so that we don't make the mistakes of- and these mistakes will still be made, are already being made- where the county agents go out to the internet and pull stuff down that they think is relevant and they go out and deliver it and they're way off base, whether it's technically or politically off base, if they had the right expertise involved, they wouldn't be.

K: I think what both of you guys said was right on. You know, I think in considering the folks I work with, most often I could talk about energy in terms of fortification and those kinds of things. But, if someone really latches onto it and it's something they want to pursue, if all of a sudden, "Wow, I really want to think about windmills," or, "I really want to think about solar," at that point, for me, I would pass the ball. Like, time to talk to someone else. I can sort of give you the menu, but I am not the detail person.

G: Yeah. I would say that roughly my role in those kind of discussions would be to be the matchmaker.

T: It's a targeted, new audience for us. Has been for about five years, is for Cooperative Extension to have a much stronger presence in the private sector. So it's been a very strategic effort for us to reach out to that.

M: Okay, with that, does anybody have anything else they'd like to add to the benefit of this discussion? Otherwise, I thank you all for your time, especially when some of you are working outside of your particular biome of expertise here. I hope this is useful for Blake as he completes his thesis. And with that, I thank you all!

Energy Focus Group #5
Extension Sustainability Summit – Newpark Resort - Park City, UT
Wednesday, October 2, 2013, 3:30pm (58 minutes)

R: I'll introduce myself first as the facilitator, I'm [Name withheld] and I run Utah's Extension Sustainability program, and I've been there for two years.

K: I'm [Name withheld]. I'm a Horticulture Agent in Salt Lake County [Utah] for USU [Utah State University] Extension.

G: I'm [Name withheld], the Director of Extension at the University of Wyoming.

M: I'm [Name withheld]. I'm Coordinator of Emergency Programs at North Carolina State University.

D: I'm [Name withheld], Director of the Western Rural Development Center at Utah State University.

R: Great, thank you. This is a big part of Blake's thesis work, so I appreciate you helping out with that. The first question is, does your state's Extension service offer renewable energy outreach? And, so, with Utah, D, that would be, and K, that would be my program

has an energy component but do you know of other programs at the state level, or even at the county level that focus on energy outreach?

D: Outreach. You know, there, there was the, remember the energy conference last year, there was the, and it wasn't Extension's, but they did the Spanish Fork windmill.

R: Yeah, Ed Stafford and, um –

D: Ed Stafford and those guys. And they do have material if other communities want to do a similar type of project. There's research programs going on, but I don't know of outreach.

K: I'd say the only thing that maybe I know, I believe, in addition to that is, um, Dallas Hanks does quite a bit of work with the biofuels. And he's got an experimental plot here in Salt Lake County out by the airport, and they do do some biomass field days, and invite the public out, and invite some of those folks out to kind of see what's going on. You know, potentially whether or not they'd be interested in starting efforts in that type of an area –

D: And they have a traveling thing they pull around and put some stuff in it and create some fuel.

M: Make some diesel.

D: Yep.

R: They fuel concerts sometimes, the Muddy Boots band –

D: Yep, they take a music band along with them at times - quite the show.

R: So that's interesting when we think of renewable energy as an Extension program in Utah, it's like, I've got a little piece, that's a little program, there's the Utah House, that is

the energy efficient model for a house, but I'd say we don't have a comprehensive coordinated energy effort in Utah. I don't know how it is in either of your states.

G: In Wyoming, I think we're attempting to have one, although we certainly wouldn't have very many people involved. We also have a biodiesel cooker that we take around in a trailer, we take around, and it has some play. We also have some Extension activities related to bio-, uh, to crops that could be grown, canola and some others, and some different varieties that can be grown in Wyoming that farmers could make diesel out of. We have a renewables program, and Wyoming has excellent resources in both wind and solar, and we have a renewables program in both of those. There is a research and outreach program for each of those in our College of Engineering and there are outreach programs related to those, uh, our colleague here, Milt Geiger, provides some coordination of those efforts with the field Extension, where we have educators who are interested in teaching on energy.

R: So Milt collaborates with the College of Engineering and research?

G: He does, he does. He collaborates some on research, but his role is to really coordinate the efforts of other colleges, and our college, and with Extension in general, and move that into the field. And so this E3A project really just fits perfectly his role as he was hired to fill, because it does that, it brings expertise that we simply don't have in our college, or in Extension, uh, to, to Extension and to our ability to direct, and its direct outreach programs. And I think he is perceived as a key part of the College of Engineering's solar and wind outreach efforts because they are really managed by faculty

members who have a small outreach component associated with their large research and probably substantial teaching appointment, so he really provides –

D: So by partnering with Milt they can get their –

G: They, they view it pretty positively, and it doesn't cost them anything, and they like that.

R: Yeah, that's great.

M: Very good. I'd say in North Carolina we have three basic areas that we're working in: The first is an older area and that would be what started out as the solar house. And then there's a lot of research that's been going on into energy efficiency and so forth that continually upgrades that project. Probably the two other areas, and one is the bioenergy area, where we have people working primarily in production of switch grass and different varieties of trees that may or may not enhance that process. And then the third, the uh, other area there, is that we have a pretty coordinated effort in turning animal waste into various forms of energy. And so those are probably the primary areas that have worked in.

R: Excellent. The programs, the ones that Milt offers in Wyoming, are those offered at the county level or are they more at a state level, or both?

G: He's trained a group of about, I think, eight area educators who primarily, I think all of them work in either agriculture or natural resources. And they generally, it is them that are delivering the renewable energy training at the local level. Milt does an awful lot of teaching too, but the model is that they will do, [Change of thought] he will train them and they will do much of the teaching in the specific areas.

R: And the materials that are developed in each of these programs we've talked about, are they primarily in the form of web information, or fact sheets that are handed out to people, or face-to-face trainings? What types of materials are available in each state for energy outreach? In Utah, we have some fact sheets, some web materials, and, uh, I don't know about the biofuels program if they offer face-to-face trainings, right now I think the bulk of our effort in this state is online materials and fact sheets. And I think that's a lot different for both your states [Wyoming and North Carolina].

K: I know in Utah, Dallas does train a lot. He's been working a lot with the military lately and been going to a lot of different military bases and working with some of those communities of people because those folks have that kind of land that they could really develop a biofuel program. And so he's constantly traveling around and speaking to groups like that, of course, coordinating with the airport, you know, things like that some of those types of tracts of land. He does do quite a bit of face-to-face promotion and training, I believe, but I don't want to speak for him.

R: Yeah, ok, that's good to know. Any other structures?

G: I think fact sheets, web resources, and a fair number of trainings would probably – some in biofuels, others in other renewables, [Change of thought] living a lot of our wind and solar work that's done by our field educators are for people that want to adapt their living circumstance to become more renewable energy-based. Solar panels, windmills, wind generators, wind turbines, those kinds of things. The other thing that Milt's working on should be, they promised me [Laughter], it'll be pretty soon, because Extension funded it [Group laughter]. Separately is, basically, he and another couple of economists

have worked on a, [Pause], basically it is a web-based tool to examine the cost and efficiency of adding wind or solar generation resources to your residential business – including your ranch. And I think what's held them up, they would say, is that, uh, as they examined the tools out there they recognized lots of deficiencies, as they tried to correct those deficiencies they found it to be more challenging than they thought it was going to be and so its taken them more time.

R: Sure.

G: He could tell you more about that.

D: Is Roger involved?

G: Actually, I don't think so. I don't think so.

R: Any others that we've missed?

M: The only thing I would add to that is that we use a lot of field days to promote a lot of these activities regarding energy, and they've been very effective.

R: Excellent. And I think that's the general approach that the biofuels program here has been using is field days. I know they do those. So, this one might be a tougher one to answer, let's focus first on, given who's here in our group, we should focus more on a state level to start. Is renewable energy outreach and education viewed as an important area among your fellow employees in your state's Extension service? [Extended silence]

G: I'm happy to try to answer that. I think that the fact that he [Milt Geiger] has gotten 8 out of approximately 25 of those kinds of interested people in our system to sign on, take a week long training, agree to do some training, and now, virtually all of them have helped programming in their own community. I think that indicates, in my opinion, good

support. We put a lot of pressure on our field people to teach, and they're looking for things of interest in their communities that they can teach people in their communities about, and so I think that's helped it. Because they feel a need, uh, they are rewarded for teaching in communities throughout the state. So one hand I said, yeah, he's [Milt Geiger] got great support and on other hand I said, well, they want stuff to teach the people to come out and watch – they're interested in, and did it.

R: And he's [Milt Geiger] got the personality to grab people's attention. He's got that skill, which is another benefit.

G: He's [Milt Geiger] worked very hard to help them gain the confidence they need - including, uh, coming out the first time and actually doing most of the training in those communities, so they could see him doing it, and then either coming again, and when the educator was doing the training - backing him up. The other thing he's done is when an educator says, "Ok, I'm going to teach about solar or wind energy in my community, Milt has been available on the phone during the time that training was being done so he could respond to questions if the educator was not available. So those are some of the things he's done to help them.

R: I think in Utah it's definitely viewed as an important area and there's a support network if I am to do anything with renewable energy, I have support from administration and from several members at the county level, but there is not a specialist position with a focus on energy. I think that would really benefit our state – is to have a position like that.

M: I would say in North Carolina it's rapidly becoming one of the bigger issues in the state. For a couple of reasons: 1) The Governor [Pat McCrory] has said that he wants us to drill oil off of the coast. They're looking at putting windmills off the coast, and they've actually passed legislation to allow fracking in this state. We have a lot of landowners that are concerned about the fracking issues. We have a lot of people in general who are concerned about drilling for oil off the coast; so it's becoming a much larger issue for Extension as a result of that.

R: That's a good insight. So we kind of answered this in our Lightning Session, but maybe just to provide a brief overview for this question while it's being recorded: What do you perceive Extension has to offer in energy programming given the role of public utilities, electric cooperatives, USDA, DOE, and state energy offices? So, we answered this as part of our Lightning Session, but can anyone summarize your thoughts based on the conversation that we've had. What do we uniquely have to offer? I guess I could start with that. With my table, we were talking about Extension having an existing clientele base, and we offer a lot more face-to-face trainings than a lot of other entities have offered in these areas, and so that's a unique skill and history that we have is that report at the county level. And so I think, not that we are inventing new materials when it comes to energy, but we have the delivery methods in place. So that was the gist from my table.

M: I can tell you that the three of us sat at the same table and we didn't get to that question. But I do have a thought on that, and you really have touched on it. More than just our history of making presentations to people, what we have is their trust at the county level. And I think that we need to be very careful through discussion of energy

use, and alternatives, and so forth, that we don't do anything to lose that trust. But I think that's probably one of the biggest things that we bring to the table. The other thing, in my opinion, would be the fact that we have a lot of very high quality Ag-bio engineers who are doing some really good work, and we have access to that information fairly quickly.

G: You know the thing I would say about that is that it's important [Change of thought]. One of the things that I think typically does not sell is any perception of duplication with other entities of government. And so I think it's really important that Extension and the university explore niche's that are not well developed and not well addressed – and actually invest our efforts there. And I think you can do that, and partner, and really make an impact.

D: What Extension has in addition to a presence in counties, a long-term presence, where they've generated trust, but we have the tieback to the university where a lot of very cutting-edge research is being done. This came up when you were talking about Milt involved with the engineers on some of these issues. Extension has opportunity at the university to work with the people who are doing the cutting-edge research and getting that out as well. Ok. Next question is: "What would it take to motivate people to learn about renewable energy?" Lets start with that and then I have some specific questions about –

K: Well, I can maybe start on that, I work in a very urban county. We're about 35 miles by 35 miles and we had just over a million people in 2010. We're projected to have about 1.5 [million] by 2040. So our population density is drastically increasing quickly, and I think that from an Extension perspective, as an educator in my county, it has been

convenience, convenience, convenience. People live very, very busy lives, a lot of my population works full time. Of those that don't work full time, this is a state that people tend to have big families. Very, very busy people. And I think that if it can be packaged and presented in a way in which it's useful, and that people really see the perceived benefit out of it, then that really helps us to promote ourselves. So I love this idea of having some sort of an online tool that shows potential energy savings. Walking people, and you really literally do have to take people by the hand and walk them through the steps of: "Maybe I'm interested in having some solar panels on my house. What are my options? What are the different technologies that are available? What's the price differentiation between this?" And to kind of go along with that I think that you guys have said beautifully that the one real niche that we have is that we are trusted, and that we are not biased, and that we are not trying to sell them one particular product over another, so the community feels like they can approach us, speak to a human being, get answers to their questions, and give them the information that they need to move forward and make whatever decision is best in their own individual circumstance.

D: In a county like Salt Lake County, when somebody decides to put solar panels on their home, what is the main motivation? Is it to save money?

K: You know, it's hard for me to say, because this isn't a field that I work in a whole lot, but yeah, I think for some people it may be a cost savings. I think for- there's a decent bit of affluence here, so I think it also might just be from a sustainability sort of perspective, wanting to do right by the environment, and interested in supporting that type of

technology in that type of areas, see it grow and develop. I guess it kind of depends on the individual that's purchasing.

M: Well the only thing I would probably add to that is that I do think is convenience is certainly a large part of it, and cost goes right along with that, depending on the community. In the more affluent communities, cost might not be as large an issue. But then there may be some tax advantages there that counter those as well. I think you've hit the major points.

G: I think, you know, our situation, of course, in Wyoming, is a little different. Our population density is among the lowest in the nation. I think there really are three, maybe four, interests that drive the utilization of renewable sources. One is being able to live off the grid, primarily because of- there are many places people want to live but the cost of a power line would simply make it impossible for them to live there. That's one. There are- there's another kind of anti-government group who would say, I just don't want to have any connection to anything like the power company or anybody else, and if I can live off the grid, then that's where I want to be. Another is kind of a- Wyoming has a very generous net metering law, in that if you become an energy producer and connect that to the grid, they basically have to pay you retail power rates. So some of it doesn't- none of it pencils out, but it comes closer than you might think. So there are a number of people that are just willing to recognize that this new house is going to cost them another $40,000 and the payback on that is going to be the next 35 years and they are willing to do it, and it's mostly green interests. They're just very interested in being efficient and they like the symmetry of producing their own. And then there are even a few of them

that say they like to stick it to the power company. And I think that's interesting because I don't have any issues with the power company, but I know people that do. [Laughter] Well because the power company, of course- if they have to pay retail rates, they loose money on every kilowatt they have to buy. Obviously they hate it.

M: We have more people joining those ranks every day.

G: That hate the power companies?

M: Yes.

G: Yeah, I don't understand that.

D: Anything else?

M: No, I don't think so. Those are all good points.

D: Okay. And then the question is- and some of these we discussed in our others- messages about things. Let me read them all and we can discuss what you want. Messages about peak oil, the declining fossil fuel energy return on energy investment, the current cost of fossil fuels, the future cost of fossil fuels, climate change, interest in renewable energy technologies, autonomous nature of renewable energy (meaning that it can be local and independent), environmental ethics. So I'm not sure I understand but anyway, I guess, what is Extension's message about these particular issues?

G: I just made a comment about peak oil and having- being pretty old and having 30 years of these projections, I don't think we're [Extension] very credible anymore. It looks to me like the technology is changing faster than we're drawing the oil supply down, so that's probably more work. People just simply aren't going to buy it. It needs to be something else.

D: I agree. You know, we think and then all of a sudden they develop a new technology like fracking and the whole thing changes again.

G: [Then] You can't give natural gas away, you know?

D: Yeah.

M: I think Extension needs to focus on what Extension does best. Stay away from projections and forecasts and focus on those things that we know to be true, and educate our clients based on those facts, and stay away form the rest of it. And as those facts change, we change the advice that we give. I think that's the safest approach we could do.

D: I liked what Kristi said in the last group, that if our goal is to [build] resilient communities, to help the community deal with what they face and what they make. Then, through Extension programs…

K: I try in my programming to be as non-conflictive, not to raise any hackles, any time I can. Anytime I can approach something as, um- certainly not argumentative or biased or things like that, I find I do better. I'm not really there to be the person to have the strong opinion on this that or the other. I'm just there to facilitate the education. I'd much rather have a resource that's available. I always, when I have a client call me, say, what is it that you're trying to accomplish, if they're looking for information in this particular area. That's my role, to guide them in helping them find additional research-based information in that particular area. I'm low enough on the totem pole that I stay out of anything in terms of causing any sort of controversy or anything like that. Educational programming.

D: You know you guys said earlier that the advantage of Extension is that we have 100 years of history of being recognized as providing unbiased, research-documented

information. We're not trying to sell anything or promote any particular product and like you said, that's what we do best. If we try to do something else, we get in trouble. We're very famous now, after being on the- [Brief laughter]

K: Specialists become a real asset in that capacity too. If I am getting into a realm where I'm getting asked about some sort of controversial issue or something like that, that's when I think it's appropriate for me to take it up to the PhD level and let a specialist be the representative at that point in time of what the university's opinion is. Because of course, they have a much more extensive background and understanding of all of the issues and all of the conversation, literature, and things like that in that particular area. You might actually have some insight on that, but I would refer it.

R: Could someone recap for me the part we're working on right now?

D: We put all of these out together and what is Extension's role in approaching these issues.

R: And- this is hard to latch on after missing some of the conversation- but my thought, in not hearing any of what's happened a few minutes ago, (I was just mentioning this with UPR [Utah Public Radio]) but with issues like climate change, the science is there. We can rely on the science that yes, the climate is warming. That's causing shifts in increased wildfire, et cetera. But the debate over how it's happening is a values debate. And I don't feel that is Extension's part to dabble in. What we can do with Extension is use our trust and our existing clientele and expertise to communicate about easy behaviors that people can engage in to help improve their livelihoods and their economic

basis while improving the local environment. To me, that's the spin on that. But I missed a lot of the conversation that happened before that so that might be disconnected.

M: That's a good synopsis.

D: Yeah.

R: Okay.

D: You agree with everybody else.

R: Okay, perfect! [Laugher] Great. And so with messages that should be avoided, just to wrap that up, the science should be our basis. The values as to why things are happening is not even worth our time, within Extension, to dabble in. But people argue about that and we can provide messages and communication to help people prepare for shifts that we know are happening based on the science.

K: Although I do feel that it is my role to make sure that I am working with different groups that may have different values.

R: Of course!

K: And sometimes I feel like in Extension, we do get a little bit- you know, we need to make sure that we're not setting this particular group aside and not offering education to those folks because they may have a strong value this way or another. And it's very- sometimes it's difficult or challenging working with volunteers and helping to teach them in that as well. When they're out and they're working with the community, and they're representing the university, you need to make sure that they understand just that. That when those sorts of things arise, what is an appropriate response and how do you

correctly represent the university and the Extension system. So it can be a little tricky sometimes because you get volunteers with strong values sometimes!

R: Yeah, that's very true.

G: So control those master gardeners! [Laughter]

R: So that's always a hard thing within Extension. If someone does have a strong value and they come to you and they're like, "Well I think climate change is just a natural cycle, what's your thought?" And then you're stuck in this position of, okay, I'm being asked a value question and yet I'm representing an organization. That's when that part is hard for me too, because once in a while that has happened and I fall back on my appointment and what I do and kind of brush that question aside, but I do wonder if I am supposed to be providing my own input on that but I've never, I try to avoid that whole road. I think it's a downward spiral. Alright-

D: Oh! There's another page there; I thought we were done! [Chuckles]

R: We're going to finish early, so that's good, but we still have a few more questions. So- and this one's probably an easy one we could answer relatively quickly; [what's] the current level of interest your clientele have in energy at your state level? Actually, maybe it's hard because clientele can vary so widely, but what are your thoughts on that? Is there a general interest level from the clientele you generally work with in learning more about renewable energy? [Pause]

K: Me?

R: I don't know, you could start if you want, K.

K: Well, I'm a horticulturalist, and so the primary interest that I get is in local food, that kind of stuff. Season Extension and things like that. So I don't deal in terms of energy, but I believe that probably the population that I tend to educate is the same type of population that probably is quite interested in some of these sustainable energy sources. They just don't see me as the expert, and that's a really good thing because I'm really not the expert in the areas. I stay inside the plant realm. So, yeah, there's probably some cross over in the population I work with.

R: I'd say that in general, the people I deal with do have a high interest in this. I run a state-wide program connecting producers with chefs, and even providing information at the farm level through programs like E3A, I feel like those people that are coming to my Utah Farm-Chef-Fork program would be very interested in learning about renewable energies as well. Those are my main clientele. As far as the kids with the sustainability camps, they're excited to learn about anything. So if you make it exciting for them, they're be excited about it! Baking brownies in a solar oven- they were really excited about solar energy at that moment. So those are my main audiences, I know they're different than some of the others that you're working with. And you already explained Milt's program, that he's already got eight people working at the county level and [energy] seems to be a pretty high interest in Wyoming. I don't know if you want to add anything?

G: Certainly those that come to programs are very interested, but probably it's a small portion of the clientele we address in the state. These are very topic-interested people,

they're very passionate about it, but it is a small portion of the citizens of the state. That's what I have to say.

R: Are they a small portion of Extension's clientele as well, or just of the state demographic as well? [Pause] I guess what I'm getting at is, are we targeting a specific person, or type of person, instead of reaching out to a broader audience?

G: Um, well I think- and again I'm looking at all of our state's clientele, and I guess I think it's probably a- and maybe we ought to discuss what would be small. But I think it wouldn't be half of our clients that are very interested. It probably wouldn't be a quarter. It might be five to ten percent that would be interested. People that we work with. Most of our clientele, realistically, most of our clientele are interested in 4H. That's probably true in Utah, too. So, and you figure some of them are interested in renewable energy but most of them are just interested in 4H. I don't know, I guess that maybe I'm probably not answering the question the way it was intended.

R: No, I think you're right on the right track of what I was looking for. And that sounds about right, five to ten percent of the overall clientele base. That's a pretty good number for a state program.

M: You know, I think the majority of the clients I work with are agriculturally based, and they have a pretty large interest in energy because that's one of the costs that they have some control over. That's a fairly high percentage of the clients I work with. But then what we've seen in the state, as I said earlier, because of the fracking issue and the drilling and so forth, I'd say we've seen a pretty good shift of interest in this area. Just over the last, probably, five years, have we seen an increased interest.

R: I'm going to ask this next question a little differently than how it is on here. And I'm going to target to you, K. We'll do a pretend scenario. So I'm going to come to you, and ask you to run a renewable energy program at your county level. What barriers would you see in being able to just go and do that?

K: Well, I mean definitely for me, knowledge base. So my first reaction to that would be to call you and say, hey R, you're our sustainability expert, and I've been asked to run this workshop at my county level. I need to ask you what kind of resources you have available that are established in that area, or if you know of other states that have run similar workshops. Kind of what's the overall structure of that and how do I set this up. Who are my regional experts that I should be getting in contact with, in terms of asking them to come in and help to facilitate and teach that kind of a conference? That's very much what I feel like I do, it's what I'm supposed to do as county faculty. It's not me doing everything and setting everything up. A lot of times I'm the facilitator and I help to bring about that programming at my county level but I need to really be leaning on my specialists and some of the other folks that kind of have that expertise in my area to help me provide that quality workshop experience that those participants would be expecting to see when they came to see a USU Extension workshop series. Hopefully that answers your question.

R: I bet that's the same in all the county levels in Utah, knowledge of where to access information on this topic. It's an intimidating topic if you haven't been trained in the area. What other barriers have come up that people have expressed in teaching or educating anyone about renewable energy at the county level?

D: You know, I don't know if this will really answer the question, but something like renewable energy is just uh- look around this room. For example, nobody's here from Colorado, nobody's here from New Mexico. And running a regional center, one of the things I view as my responsibility is to connect people across state lines. I'm hoping that if the question came up in a state that doesn't have anything we could help connect them with a Milt or somebody in a state that does have expertise in that area. These are things that are very unevenly scattered across the West. In tight budget times, states just aren't adding a whole lot of new programs right now. In a way we did a rural connections program on renewable energy, and there's a lot of expertise around, but it's here and there and scattered around the West. So we do know who some of those people are, but they aren't everywhere. So I think in addition, in Salt Lake County, there may be a possibility of connecting you [K] with somebody in Wyoming that could help with some of these kinds of programs. The North-Central region, and we need to think about this too, is working on kind of a trade thing: that Wyoming expertise could go to Utah to do some training, either get paid or in exchange for somebody in Utah that has some expertise to come into Wyoming to provide similar kinds of training. They've just started that in North-Central and we need to think about that model too. Not really answering your question but-

R: No, that was great.

G: We really are already doing that in a number of cases. One specific case is dairy and Utah State University. We pay them to provide support for the dairy industry. I think the mechanisms are there to do it.

K: We have a larger program too. This is different; this isn't energy. We have a master gardener's circuit with Idaho. Actually, Wyoming as well. And it's really nice because we are able to take a topic and teach that topic to several different counties in Utah, and then spend a week and I go up to Idaho. I teach it in four or five counties in Idaho. It's really nice; we can have this sort of traveling expertise. We typically teach in areas where we have some sort of past experience or education specialty in that area, and students really love it, too. It really helps to relieve us, where master gardener programs are grueling. I mean [those are] 14 weeks, a different topic every week. And you can imagine if you were teaching each of those classes, that wears you out. It really does. And that's during a busy time of year, so it's a great way that we can be teaching intensively for a couple weeks and then have other colleagues coming in and cycling through and take advantage of some of the expertise in Idaho and Wyoming, you know, go up there. It works out well.

R: I love that structure. I wonder if that would be possible with energy, to offer programs at similar times and then have people travel from state to state. It's a good idea.

D: Anything in North Carolina?

M: Nothing new.

R: So maybe I should start this one with Wyoming. Does your county or state have roots in fossil fuels, natural gas, or nuclear energy production? Could this be causing renewable energy to be perceived as a threat among clientele?

G: Well, in Wyoming's case, we also have great wind resources, so I would say no. In our case, I don't think people consider renewables to be a threat. They may not take them

seriously as a threat to the fossil fuel opportunities. I mean we have all three of them. Uranium mines are cooking along, producing uranium [in Wyoming right now] for all of the nuclear power plants that are being built in China. They're mining coal; it's down some-

M: Yet you're still the number one coalmining state in the nation.

G: -but they're still the number one coal producer. And natural gas, we could double production instantly if the price went up. And on the other hand, the one thing I would say about that- and this really doesn't answer your question- we've got a wind corridor in Wyoming that is exceptional. What you could have is a corridor along the Laramie range, really from Casper to Cheyenne. That is just thousands and thousands- you know what, a 180 mile corridor of just thousands and thousands of turbines. I think people in Wyoming would rather see coalmines and oil wells. You see what I mean? Because [those are] less distracting, less obstructive of the view sheds. In some case, the reclamation has been a challenge because the wind is new and getting the reclamation done and all the roads that are built are creating invasive species problems. Whereas in the case of coalmines, to a lesser extent, in natural gas fields, that reclamation issue has pretty much been worked out. It's pretty well settled in state law and those companies know what they have to do and it works pretty well. The wind companies came in and started doing it and we didn't have the laws in place to control the reclamation or the deconstruction of wind turbines. You know, what do you do when they decided, eh, it's not worth putting a new power head on top of this pole? Those are coming into place, but there are a lot of concerns. So anyway, there's that. I would say no, not really considered to be a threat. There's a lot of

concern about the case of coal. There's a lot of concern about what Wyoming folks would call the "Liberal agenda" related to carbon.

D: Related to what?

G: Related to carbon. So the state is investing millions of dollars every year in liquefaction technologies; liquefying coal to be basically motor fuel and some of those kinds of things. Natural gas for some of those kinds of things that can really probably extend the life of coal reserves if carbon really becomes an issue.

R: That was great insight, thank you. Did anyone want to add anything to that question?

M: I don't think it's a big issue in North Carolina, although I will tell you the one thing that is an issue is that our people have a tendency to do their homework. So when an issue like fracking or drilling offshore comes up, they have a tendency to dig into it and try to find their own answers rather than just coming to Extension or anyone else. That can create some good opinions but it can also create some false opinions as well, so we have to deal with those. But in general, what we've found is we're dealing with pretty well-educated clientele in North Carolina. So they make us work, from that perspective. And that's a good thing, I think, but I don't think they're any more leery of alternative energy than [anyone else], based on our history, because we just don't have enough history with energy production in the state.

R: That's interesting. Well, we're at the tail end so, getting there! What group should be targeted for renewable energy programmatic efforts? So let's start with age groups. Is there a certain age that should be the focus for renewable energy education or not?

D: I don't know- as we were talking about food this morning and as we talk about energy, I think the important thing is that we've got- [Change of thought] and I'll blame it on a somewhat urbanized population whose idea is electricity comes from turning on the switch and food comes from the grocery store, and I think just increasing understanding of where these things come from to everybody is- [Change of thought] So I don't know about- again, maybe a focus on an urban population for some of these. You're in Salt Lake, does that, uh-

K: Yeah, and I'm really sneaky that I target youth because kids get excited about everything and they are the emerging population. I find (again I don't deal specifically with energy) that I can get curriculum and materials and things like that in the hands of youth, parents pay attention to what their kids are bringing home from school. And they want to know what their kids are learning in school. So if you are able to engage them in different activities and camps and things like that, it's a great way to kind of start the conversation on the family level. I teach a pollinator- which I have over here- I teach a pollinator curriculum. It's called the PUPs program, the Protectors of Urban Pollinators. We have a little activity guide that goes through a series of activities. As we teach the curriculum to the kids, we let them play with all the things and that sort of thing and walk them through the curriculum. They have their little PUPs packet, which is similar to a Junior National Park Ranger packet sort of thing, where they have a series of educational activities they complete. Well, you know, I know parents are seeing that when the kids take that home, and what I like about it too (and this is maybe a little bit away from the conversation) but it's a great way for a university to brand itself as well. I love the fact

that it says “Utah State University Extension” on that PUPs packet so that when the parents see it, they know exactly where that information is coming from and who it was that developed that curriculum. So I think that definitely there’s a lot of interest in urban settings in terms of renewables. You know, I really think probably online tools and things like that [are effective], kind of like you were talking about in North Carolina, people like to do their homework. Providing them the type of tool they can use that they can get online [is important]. We find most of our hits to our website are around 11:00 PM at night; it’s not during business hours. People are doing a lot of research right before they’re getting ready to go to bed. You know, they’re kind of typing around on the internet, so having those sorts of resources available to facilitate them in doing their homework, but yeah, I would argue that probably with sustainability I’d go after the kids because I think you get interest there!

D: In one of the presentations this morning I noticed that they had the kids at the camp but the family’s behavior changed because the kids were taking that stuff home.

R: We have ten now that have responded, and the reason we have ten responses from seventeen kids is that some of the kids were brothers and sisters, but every behavior now is statistically significant in its change as a result of the camp and they’re all at the family level. Doing things with kids does transition back to the household.

K: Kids are moldable. I figure I have five to seven years to shape this child, and then at that point in time he’s his own individual and there’s absolutely nothing I can do and we’re all dead-set in our ways by the time we become adults. So again, it’s not my role to try to change somebody’s opinion or try to alter what they think. I can provide them the

educational resources. But kids are a population that really has minds like sponges and they like to get excited about things. I like the fact too that kids are going to be our innovators, they're going to be our engineers, they're going to be the people that we want to have the crazy ideas to turn out to really shape-

R: I will say also, piggybacking on that, it's important, I feel- as part of this camp, we provided fact sheets on each of the specific areas for the parents, too. So on energy day we had a "Tips to Reduce Your Energy Bill" fact sheet for the parents and same with every day. At the end of the camp, we sat the parents down for an hour where it was set up like a presentation of what the kids did for the week, but it was really educating the parents on these concepts to make sure they keep it active. I think it's important to both. But a lot of these programs that we've learned about today are adult programs. I wonder, I'm curious, I guess, as my final question with this is: with adults, who should be the primary focus, and who are we currently focusing and is that being effective? And I can't attest to Utah because we don't have a solid program for adults in energy. I don't know if either of you [G and M], with your states. While you consider that, I'm just going to make a quick announcement as folks are wrapping up. Okay. So I don't know if you want to provide any final thought on the adult side, if there are any groups that have been more effective than others or more enthusiastic.

G: I think for us it's really two groups: people that are really looking for the economic advantages, and the second would be those who would also come to local foods, to our high tunnel season extender workshops, that sort of "take care of yourself," "be self-sufficient," that sort of a group. Almost counterculture in some ways.

M: And I would agree with that. I think those are the main motivations.

K: I would throw in teachers, too. I think that that would be, if you're looking at adults, developing programs for teachers might be good. I know in Salt Lake City School District for example, this isn't a USU Extension (I know you know about this too, R), but they have kind of a sustainability curriculum where the schools can earn different accreditation. It might be a bronze, silver, or gold or platinum, and it's based on the programming within the school system. So maybe if the school develops a recycling program or if the school, uh- you know, these different areas of sustainability they can earn these different accreditations, and that's something that's really taken off in the Salt Lake City school system.

R: I know that Colorado's Energy Masters program offers continuing education credits for educators, so that's one way they've been able to tie in with teachers. I think that's a big thing, too, because they reach a lot of kids. And if they buy in and understand the concept then the potential to spread that information far and wide is huge. [Topic change] Thanks guys, you guys are troopers! Thanks for surviving through this!

G: Thank you!

APPENDIX D

UTAH STATE UNIVERSITY EXTENSION SURVEY INSTRUMENT

UtahStateUniversity
EXTENSION SUSTAINABILITY

Your Views on Traditional and Renewable Energy Outreach in Utah Extension

Given your role in Utah State University (USU) Extension, you were selected to participate in this Extension survey. The survey gauges your attitudes and views on renewable energy outreach, education, and programming. The survey should take approximately 8-10 minutes to complete. We appreciate your participation!

Who should complete this survey?

This survey is being distributed to all Extension employees in Utah. All USU Extension employees are eligible (faculty, staff, administration, specialists, experts, part-time employees, etc.). If you are not a USU Extension employee, then there is no need for you to complete the survey.

Participation in this survey is voluntary, but for our results to be scientifically valid, we need as many employees as possible to complete the questionnaire.

If you have questions about the study or eligibility, please contact one of the project leaders:

- Blake H. Thomas, Utah State University: blake.thomas@aggiemail.usu.edu
- Dr. Roslynn G.H. Brain, Utah State University: roslynn.brain@usu.edu

If you have any questions or concerns about your rights and would like to contact someone other than the researchers, you may contact the IRB Administrator at (435) 797-0567 or email irb@usu.edu; refer to IRB protocol #5161.

Thank you very much for your help!

We are looking to better understand your attitudes toward different energy sources, your preferred delivery methods of energy information within USU Extension, as well as your interest in the creation of a state energy specialist position.

Below is a summary of key terms that will be used in the survey. Hover your mouse over the blue text to see definitions:

Renewable energy sources

- *Biomass*
- *Hydroelectric*
- *Wind*
- *Geothermal*
- *Solar*

Nonrenewable energy sources

- *Petroleum*
- *Coal*
- *Natural Gas*
- *Nuclear*

Your Perspectives on Energy

To begin, we would like to understand your perspective on different energy resources.

What do you believe the percentage of U.S. electric energy supply from renewable resources will be in the next 10 years? Note: Renewable resources accounted for 13% of U.S. electric energy supply in 2013.

Less than 25%	25-50%	51-75%	More than 75%
○	○	○	○

To what extent do you agree or disagree that Utah is lagging behind other states when it comes to developing renewable energy sources?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

Some ways of generating electricity may be harmful to the environment because they produce air pollution, water pollution, toxic wastes, or other environmental problems. How environmentally harmful do you think each of these power sources is?

	Very Harmful	Moderately Harmful	Somewhat Harmful	Slightly Harmful	Not Harmful At All	Don't Know
Coal-fired power plants	○	○	○	○	○	○
Wind energy	○	○	○	○	○	○
Solar energy	○	○	○	○	○	○
Geothermal energy	○	○	○	○	○	○
Hydro power	○	○	○	○	○	○
Nuclear energy	○	○	○	○	○	○
Oil-fired power plants	○	○	○	○	○	○
Natural gas-fired power plants	○	○	○	○	○	○

Please describe your level of agreement with the following list of commonly perceived public barriers to distributed renewable energy development.

Distributed energy consists of a range of smaller-scale and modular devices designed to provide electricity in locations close to consumers. In other words, the following questions are directed toward *small-scale, individual-users* (e.g., rooftop solar), rather than utility-scale facilities (e.g., large wind farms).

Most Utah residents consider the upfront costs of renewable energy systems to be too expensive to install.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

Renewable energy technologies are considered to be too risky by most Utah residents.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

The process of transitioning to renewable energy sources is too complex for most Utah residents.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

The majority of Utah residents consider Utah's geographic location unsuitable for renewable energy technologies to be productive.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

How well informed are Utah residents about the following as they relate to Utah?

	Not At All Informed	Slightly Informed	Somewhat Informed	Moderately Informed	Very Informed	Don't Know
Household energy efficiency?	○	○	○	○	○	○
Renewable energy incentives and rebates?	○	○	○	○	○	○
Credible sources of energy information?	○	○	○	○	○	○

Your Perspectives on Renewable Energy in USU Extension

Next, we want to understand your level of interest in renewable energy within USU Extension, and whether you feel the need for a campus-based Renewable Energy Specialist. This Specialist could, for example, design programs and trainings in renewable energy for the county level.

Does your office offer any programs, outreach, or education about *energy efficiency* to the public?

- ○ Yes
- ○ No
- ○ Don't Know

Does your office offer any programs, outreach, or education about *renewable energy* to the public?

- ○ Yes
- ○ No
- ○ Don't Know

To what extent do you agree or disagree that there is a *public demand* for USU Extension to provide renewable energy information, programs, and outreach?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

To what extent do you agree or disagree that there is an *internal demand* (USU Extension faculty/staff) to receive renewable energy information?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

To what extent do you agree or disagree that renewable energy trainings would enhance *your* Extension outreach efforts?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

How interested would you be in collaborating with an Extension colleague in delivering a renewable energy workshop for your clientele?

Not At All Interested	Slightly Interested	Neutral	Very Interested	Extremely Interested	Don't Know
○	○	○	○	○	○

To what extent do you agree or disagree that there is a need for a Renewable Energy Specialist in USU Extension?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
○	○	○	○	○	○

To what extent do you agree or disagree that the following tools would be useful for USU Extension to communicate renewable energy information to the public?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
Energy website maintained by USU Extension	○	○	○	○	○	○
Fact sheets	○	○	○	○	○	○
In-person workshops	○	○	○	○	○	○
Cell phone application or "app"	○	○	○	○	○	○
State Specialist to refer to	○	○	○	○	○	○

Please provide any additional thoughts or comments on USU Extension's energy future and outreach needs.

You're almost finished! We only have three short demographics questions left for you.

As a reminder, the information that you provide will remain completely confidential.

What is your gender?

- Male
- Female

What is your age?

- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75 years or older

What is your highest completed level of education?

- Some high school
- High school / GED
- Some college or Associate's degree
- College graduate (Bachelor's degree)
- Postgraduate degree (Master's / PhD)