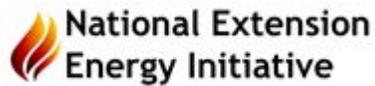


National Energy Education Needs and Priorities: A Roadmap for the Cooperative Extension System

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Cooperative Extension and US Energy Needs

The mission of the Cooperative Extension System (CES) is to provide non-formal educational programs grounded with research-based knowledge that emanates from the nation's Land-Grant Universities and Colleges (LGUs). This system is a network of universities, and by design, it collaborates with many other national, state and local entities. Specifically, in providing energy-related educational programming there is a strong partnership that involves the US Department of Energy (DOE), the National Association of State Energy Officials (NASEO), and State Energy Offices (SEOs). **The following ideas are expressed with the goal of enhancing such partnerships.**

Cooperative Extension has a wide range of energy-focused programs and applied research activities. Some of the most exciting opportunities for expanding the partnership between CES and DOE falls across these areas:

- Residential/citizen education on energy efficiency and conservation.
- Assistance to community organizations, local governments and public facilities with planning, priority-setting, and collaborative educational programming.
- Rural, on-farm, agricultural energy conservation/efficiency/independence, energy audits and applied research on energy consumption and evaluating alternatives.
- Small business development, including planning and tools for evaluating energy needs.
- Collaboration with State Energy Offices (SEOs) and State Energy Programs (SEPs).

Moreover, across all of these areas, CES is well positioned to address central topics that apply to all sectors, such as: renewable sources of energy, feasibility assessments, and working with energy utilities and industry/trade groups.

RECOMMENDED NEXT STEPS – we encourage expanded discussions with DOE that will identify specific ways to enhance linkages within the areas described above. We suggest an expanded dialog for each area (above) with the intent of identifying ways to strategically expand LGU programs (Extension and Research) into DOE supported programs at the federal and state levels.

As further explanation where opportunities lie, we offer the following summary of key initiatives that might be considered for national expansion.

The National Network:

The National Extension Energy Initiative (NEEI) represents the primary energy professionals within Cooperative Extension from more than 30 states. NEEI is well positioned to assess and prioritize energy education needs that can best be addressed by CES educators/agents (with community-based education and applied research). NEEI leverages the CES network at the state, regional (multistate) and national levels by sharing expertise and fostering collective responses to a range of topics, including: energy development, energy efficiency, and renewable energy for urban and rural communities. Members of this professional affiliation group meet regularly via conference calls, webinars and annually at the National Extension Energy Summit. NEEI also seeks to partner with other organizations and agencies (e.g., NIFA and DOE) with the goal of increasing the integration of CES education and research with collaborators.

State Capacity and Coordination

As of early 2016, 45 states have on-going efforts in Extension energy programming. Nearly half (22 out of 45 states) have at least one Extension staff member dedicated to providing this energy programming. Common themes for this work include: applied-research; educational programs for individuals and communities; informational materials via websites/blogs, publications, and newsletters; targeted workshops/classes; residential, business, rural and on-farm energy audits; and working with volunteer-led programs.

Local Program Delivery

A recent survey of NEEI members (2015) found CES programming addressing:

- (27%) biofuels,
- (22%) ag energy,
- (18%) energy literacy, and
- (11%) home energy, community-level engagement, and others.

CES has the ability to offer national experts, each with specific areas of expertise on a range of energy issues, problems and needs (above). Furthermore, our community energy education programs involve Extension educators who work closely with consumers, businesses, utilities and local government to develop and implement new sustainable energy practices. An important strength of CES is to meet unique needs with education and research at a local-community scale. CES also has developed educational materials and publications, core curriculum, and uniform outreach strategies that are often shared nationally within the LGU network – and with other agencies and stakeholder groups. A few of these examples include:

Exploring Energy Efficiency & Alternatives (E3A)

A curriculum created by Montana State University Extension and the University of Wyoming Extension in 2013. It addresses clean energy technologies for the home, farm, and ranch, and is intended to be taught by Extension educators. It is now available as an open source document under a Creative Commons Non-Commercial License.

The Energy Master volunteer program

This program features a broad overview of energy as well as practical actions for household clean energy. It has been delivered via a mix of online and in-person media. Volunteers have completed projects such as translating energy information into Spanish, delivering energy programs to 4-H youth, conducting home energy assessments, installing low-cost efficiency items in homes, and more. Colorado, Arizona and Virginia have been involved in this program.

Rural Ag Production and Energy Consumption

Extension assists with economic feasibility assessments for renewable energy systems on farm and for rural businesses. Such assessments have been supported by USDA's Rural Energy for America Program (REAP). Extension energy research has focused on biofuels and farm energy. Some states, such as Minnesota, have program initiatives focused on energy efficiency best practices in livestock operations. These programs often address lighting upgrades, making feeding and watering systems more energy efficient and overall energy savings in animal confinement operations like dairy farms. Likewise, CES programs in western states may address energy efficiency in ag production associated with irrigation, cropping systems and ag product processing/handling. *NOTE: CES programs on bio-fuel are included in on-farm energy efficiency, however, much of our approach is in addressing crop production.*

K-12 Education

Formal educational settings such as K-12 schools follow state and national standards. Extension education has focused on informal educational settings for youth but is interested in expanding its impact by teaching during the school day inside the K-12 classroom and in some cases train the trainer sessions for teachers. Success has come when Extension teaches teachers about new and innovative topics which they then use in the school environment. Teachers of Science conferences are one location where such training can take place.

Community Energy Assessments

These assessments screen rural communities for the potential to cost-effectively participate in over a dozen energy programs and funding/financing opportunities, recommend actions, and support implementation of locally selected projects. Colorado State University Extension is a leading institution for these efforts.

Utility Education

Many utilities already provide energy information and resources to their customers. They are a direct conduit to their customers for much information. Several state programs have developed specific partnerships between energy utility companies and Cooperative Extension that offers educational programs designed to help consumer make informed choices about home, residential and farm energy conservation and efficiency. In these programs Cooperative Extension is often seen as neutral in providing information and choices to consumers, whereas a utility may be viewed as having a conflict of interest because it ultimately charges the consumer for their energy usage.

Working with Industry Association/Trade Groups

Industry Associations and Trade groups are a dominant force in the clean energy arena and Cooperative Extension through its local network of educators could be a local partner in education and training. Cooperative utilities, for example, are served by the National Rural Electric Cooperative Association (NRECA). Municipal utilities are served by the Association of Public Power Authorities (APPA). Both of these associations provide education to their utility members along with lobbying. Likewise, renewable energy trade groups (e.g., Smart Electric Power Alliance (SEPA)) also educate utilities around topics such as distributed energy resources, solar, storage and grid management. Much of this work is focused on educating both association members and the general public about the industry itself. Extension could be a good partner to these entities for several key reasons. First, national level associations are often looking to local partners who may be able to provide more local expertise and knowledge. Extensions could serve as this local vehicle. Second, national level associations often tend to the work with the largest members, or those who have most capacity to raise their hands. This can leave smaller players, or those with less capacity to engage at a national level, feeling somewhat left out and still in need of technical assistance and expertise. Extension could serve as a conduit to these smaller players to amplify their voices and ensure they receive the assistance to help move forward on emerging energy opportunities.

Collaboration with Non-profits

There are a tremendous variety of non-profits working in the climate and clean energy activism, policy and educational space. These vary State-to-State and vary in their foci and capacity. These groups are in some instances potential partners. In other cases, these groups may be filling an educational gap that Extension could assist in meeting needs. For example, the Midwest Renewable Energy Association offers accredited solar training programs for new entrants into the solar and small wind industries. The Solar Foundation is a national non-profit that offers solar training and technical assistance to local jurisdictions to assist them with solar readiness. The Clean Energy States Alliance is a national non-profit that works, largely through State Agencies like State Energy Offices, to advance clean energy. These groups publish resources and information on a wide variety of topics and may welcome the research-based information from CES. Extension will need to recruit the support and contributions of companies, non-profits and NGOs in order to deliver the

highest value, relevant content and process skills. Extension's brand-value and well-earned respect as a source of reliable and credible information will attract those firms and organizations who likewise value transparency and quality.

Meeting Needs of Small and Medium Businesses

In the energy efficiency and renewable energy industries, there are companies ranging from performance contracting firms to solar and wind developers who are educating local units of government, land-owners, business leaders and others about the economics of making changes. Partnerships between Extension and private industry are common for agricultural audiences where private industry supports and sometimes participates in Extension educational events. These partnerships are also possible for energy Extension efforts. Examples of this are happening with solar installers supporting Extension solar economics workshops as well as partnering with solar installers to host hands on workshops.

Educational Materials and Curriculum – tailored to specific audiences

Many Extension energy programs have developed decision tools to help households make more informed energy decisions. Examples include Colorado State University's online **solar calculator** and **home energy audit**, University of Minnesota Extension's **Right Light App** and their **Clean Energy Resource Teams (CERTs)** partnership's **community solar garden** subscriber resources.

Energy Efficiency and Renewable Energy Adoption Survey (Applied Research)

Applied research specialists within the LGU network are capable of conducting a national household survey to gauge the adoption and use of energy efficient appliances, lighting, vehicles, and renewable energy sources. While some of this assessment has occurred in limited scale, it could be greatly expanded with DOE support. Applied research needs can also be extended to areas such as: renewable energy on-site assessments, case studies, product assessment/evaluation, and on-farm demonstration of equipment and management.

Energy Benchmarking

A number of states use energy benchmarking as an essential energy planning tool. For example, Minnesota CES assists in the **Minnesota GreenStep Cities** program that relies on performance contracting for energy improvement, solar planning and zoning, and community clean energy engagement with main street business. The role of CES is to help communities access and utilize energy benchmarking tools and plan and evaluate ways to reach their energy-related goals.

CES Coordination With State Energy Programs (SEPs) and State Energy Offices (SEOs)

State Energy Programs (SEPs) administered by State Energy Offices (SEOs) are supported by the US Department of Energy (DOE). The National Association of State Energy Offices

(NASEO) is the national coordinating entity that connects these State entities. All of these entities are important agents of change – advancing practical energy policies and supporting energy technology research, demonstration, and deployment through State Energy Plans. Presently, 42 states (approximately) have State Energy Plans, and while each plan varies, in general they describe a State’s energy priorities, objectives and policy aims. Cooperative Extension in each State should be encouraged to consider how to best to assist in the implementation of those plans – and specifically there needs to be renewed support for the State Energy Extension Partnership (SEEP).

*The State Energy Extension Partnership (SEEP) was developed based on a Memorandum of Understanding (MOU) between the US Department of Energy (DOE) and the US Department of Agriculture’s (USDA) National Institute of Food and Agriculture (NIFA). This effort was a project of the State Energy Advisory Board (SEAB) made up of State Energy Office and Weatherization Directors who have an interest in energy issues. It includes two members from University Extensions. SEAB members believed that there was much more that Extension Offices and State Energy Offices could do together than was happening and therefore pushed to get the MOU signed and projects going to start further developing these partnerships. The explicit purpose of SEEP was, “... to identify issues, develop solutions, and share promising practices collaboratively across organizational, geographic and programmatic boundaries to promote energy efficiency and renewable energy.” This partnership funded an initial cohort of State Energy Office and Extension collaborations in Wisconsin, Nebraska and Kentucky. **These efforts, have been successful in fostering greater collaboration between SEOs, their SEPs and CES. Support for this effort should be restored, perhaps in direct partnership between DOE and the LGUs/CES.***