2012

Meeting on-farm energy needs through conservation, efficiency and renewable energy

Kamyar Enshayan
University of Northern Iowa

Carole Yates
University of Northern Iowa

Meeting on-farm energy needs through conservation, efficiency and renewable energy

Abstract
A working group centered on the demonstration and promotion of energy saving practices used meetings, field days and mini-grants to communicate with farmers.

Keywords
Bioeconomy and energy

Disciplines
Natural Resources and Conservation | Oil, Gas, and Energy

LEOPOLD CENTER
FOR SUSTAINABLE AGRICULTURE

Meeting on-farm energy needs through conservation, efficiency and renewable energy

Abstract: A working group centered on the demonstration and promotion of energy saving practices used meetings, field days and mini-grants to communicate with farmers.

Principal Investigator:

Kamyar Enshayan

Co-investigator:
Carole Yates
Center for Energy and Environmental Education
University of Northern Iowa
Cedar Falls

Budget:
$40,000 for year one
$40,000 for year two

Q Can you reduce on-farm energy use by focusing on practical farm-scale things that farmers can do without a full-fledged state-run farm energy services organization or through utilities?

A Yes, the Farm Energy Working Group used demonstration grants, presentations on successful national efforts, talks by Iowa farmers who are using energy efficient practices and/or renewable energy on their farms to make Iowa farmers aware of their options for and need to reduce fossil fuel use. But a full-fledged statewide program will benefit the state greatly by consistently providing the same farm energy services to all regions of Iowa.

Background

The goal of the project was to facilitate the development and coordination of a state-wide Farm Energy Working Group (FEWG) to encourage on-farm research, implementation, demonstration and outreach for a wide variety of energy conservation, efficiency and renewable energy practices to meet on-farm energy needs of Iowa farms, especially small to mid-sized operations. The group involves key state organizations, energy practitioners and farmers.

The original purpose of the Farm Energy Working Group was to respond to the need for small to mid-sized farms to find sources of energy other than fossil fuels. Its mission was to help targeted farms meet a significant part of their own on-farm energy needs through energy efficiency, conservation or renewable resources available on the farm.

The Farm Energy Working Group also aimed to serve as a one-stop shop for information and expertise on meeting on-farm energy needs for these smaller farm operations. Finally, there was a need to increase communication among Iowa farmers and others who support the goals of using energy efficiency and renewable energy, to highlight existing work, to make clear what options and incentives are available to farms and to inspire more work in this area.

Approach and methods

The Farm Energy Working group meets quarterly and is facilitated by the University of Northern Iowa's Center for Energy and Environmental Education (CEEE). The organizers invited Iowa's renewable energy practitioners, farmers with experience in conservation and renewable energy, installers of renewable energy systems, nonprofits and other energy leaders to take part in the meetings. Participants are from Practical Farmers of Iowa, Iowa Farm Bureau, Iowa Environmental Council, Iowa Renewable Energy Association, Union of Concerned Scientists, Iowa Energy Center, Iowa

Jack Bensink explains the combined solar PV/small wind inverter installed on his farm with partial funding from a Farm Energy Working Group mini-grant.

Farmers Union, three state universities, ISU Extension, three types of utilities (investor-owner, municipal, rural electric cooperatives), and the Leopold Center, as well as farmers and crop consultants.

In addition, these grant funds were used to enable working group participants and others to apply for small demonstration grants focused on research, education and on-farm case studies, all featuring energy conservation, efficiency and renewable energy to meet on-farm energy needs. The group invites local and national practitioners to highlight their work, shares inspiring examples through farm field days, makes this working group known to many farmers, and enables participating entities to intensify their work in meeting on-farm energy needs.

Results and discussion

The FEWG activities over two years of the project were varied. The group:

- Brought together participants to exchange insights, learn from one another's expertise, network, support implementation of efficiency and renewable energy on Iowa farms, and learn from existing examples in Iowa and around the nation.
- Increased communications among many entities already active in the field and provided a go-to place for experience and information resources. The participant list grew from 45 to more than 80, representing farm organizations, universities, state extension, all types of state utilities, renewable energy organizations, USDA, NRCS, DNR, RC&Ds, statewide energy organizations, policy organizations, and farmers on small to midsize operations.
- Cosponsored three workshops on how to write REAP grants focusing on energy efficiency and/or renewable energy on the farm.
- Highlighted existing local and national efforts and enabled participating entities to intensify their work in meeting on-farm energy needs through conservation, efficiency and renewable energy. Representatives from Wisconsin and Massachusetts farm energy statewide organizations shared their expertise as well as Iowa representatives of the Farm Energy Working Group.
- Routinely invited leading practitioners to share their insights and expertise on specific topics. Practitioners included Steve Fugate, biodiesel; Mark Runquist, wind on the farm; and Francis Thicke, solar PV/solar hot water on a dairy farm. FEWG representatives from Alliant Energy and CIPCO (RECs) discussed their farm energy rebate/incentive programs. Other speakers focused on topics such as anaerobic digesters in Iowa, farm energy from wind, FECs solar PV program.
- Identified and published on the website information about state and federal incentives, grants related to on-farm energy efficiency, conservation and renewable energy implementation.
- Collaborated with Practical Farmers of Iowa in planning workshops and field days as well as on-farm research.
- Made available small seed grants to group members and others to further the goals of FEWG. During year one, three grants were given to help install a biomass (wood-burning) boiler to heat a greenhouse and to repurpose an underground bunker into two storage chambers to dry/cure and cool produce. During

A Working Group mini-grant enabled Greg Hoffman to add a wood burning boiler to his small vegetable/fruit farm and heat a hoop house to extend the growing seasons.

year two, six grants were completed on topics such as farm energy analysis, site assessments for solar PV and wind on the farm, benefits of growing biomass crops, and collecting energy data on efficiencies of a robotic milking machine.

- Shared outcomes of demonstration grants through existing networks participating in working groups of the Leopold Center. The results were shared at field days coordinated by partnering organizations and at topic-specific workshops such as a biogas workshop, documented farmer success stories (case studies) appeared on the website, reports were published, and group members reached out to farmers, energy professionals and extension staff.

Conclusions

- Farmers on small to midsize operations, especially vegetable and fruit growers, increasingly are more interested in options for reducing fossil fuel use, saving money, and using more environmentally sound practices on their farms.
- Many Iowa utilities are supportive of farmers who want to reduce fossil fuel use. Several RECs have rebate/incentive programs around farm energy. Alliant Energy has been a strong partner in the working group and several municipal utilities also are interested in participating.
- Providing small demonstration grants requires a lot of oversight from the project coordinator before, during and after awarding a grant. These grants were intended to be very farmer-friendly, so the working group provided help with writing the grant, called the farmer for updates and compiled that information and offered the farmer the option of a verbal final report, rather than a written one. Participants have been very willing to share their grant work with others and demonstrate once again how innovative farmers are with their ideas and resources.
- The working group needs to reach out more to farmers and go where the farmers are, since it often is difficult for farmers to attend a working group meeting.

Impact of results

Working group membership and attendance at quarterly meetings in the second year was expanded to include six farmers with small to midsize operations, two installers of renewable energy systems, two nonprofits and other energy leaders. The grant-writing workshops and other outreach projects helped add more than 40 farmers to the group emailing list. While it is difficult to hold meetings at a time of year when farmers can attend, information that they may find useful for reducing their fossil fuel energy use was emailed to them. Farmers also are talking to their peers and this is one of the most effective forms of communication.

All farmers who have received demonstration grant funding are willing to share their stories. One of the grant criteria is that projects can be easily replicated. The FEWG website features firsthand accounts of farmers trying some of the strategies their peers demonstrated through these grants, i.e., the robotic milking machine is being adopted by several farmers in the Maquoketa Valley REC. FEWG meetings are another place where farmers can hear what their peers are doing, compare findings and learn from each other. UNI and PFI have submitted a SARE pre-proposal to the North-Central Region of SARE for developing specific on-farm electricity savings.

Education and outreach

A FEWG brochure was published and newsletters were issued in April 2010 and January 2011. Announcements of news such as the group's meetings and grant recipients have been covered by the *Des Moines Register, Waterloo Courier, Wallace's Farmer,* Iowa Public Radio and the Iowa Radio News Network. The Iowa Farmers Union newsletter asked FEWG to submit articles for each quarterly issue.

FEWG co-hosted half-day workshops at the Practical Farmers of Iowa Annual Conference in 2011 and 2012; several field days also were sponsored by Practical Farmers of Iowa highlighting farm energy solutions.

FEWG sponsored three Iowa farmers to attend the Midwest Renewable Energy Association Expo to see how they could incorporate renewable energy on their farms. One farmer reported that he continues to work on developing a farmer-owned wind turbine project near Eldora and keeps making changes to reduce energy use in his home since he no longer farms.

Leveraged funds

FEWG collaborated with Practical Farmers of Iowa in planning workshops and field days through in-kind staff support.

Iowa farmers learned about writing a USDA REAP grant at workshops held by the Farm Energy Working Group.

For more information, contact:

Kamyar Enshayan,
CEEE 109 0293
University of Northern Iowa
Cedar Falls, Iowa 50614;

(319) 273-7575,

e-mail

Kamyar.enshayan@uni.edu