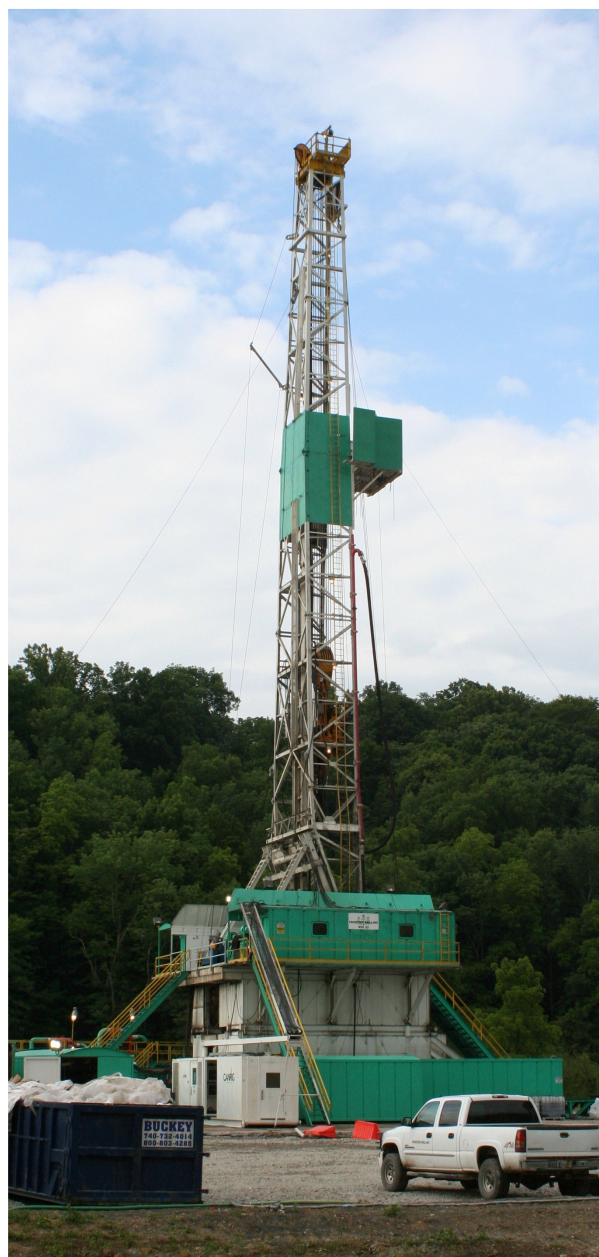


OHIO STATE UNIVERSITY EXTENSION

Energize Ohio: Building Ohio's Energy Future

2013 Annual Report



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

Acknowledgments

A special thank you to the following Energize Ohio Team Members for their contributions to the development of this annual report.

Eric Romich, OSU Extension Field Specialist, Energy Development

Chris Penrose, OSU Extension Educator, ANR & Co-Leader Extension Shale Work Group

Mike Lloyd, OSU Extension Educator, CD & Co-Leader Extension Shale Work Group

Nancy Bowen, OSU Extension Field Specialist, Community Economics

“This program presented critical information on energy efficiency, energy cost savings and utilizing existing green sources of energy. The lower energy costs make Ohio a more competitive state, which helps retain and attract jobs, especially in the manufacturing sector.”

— **Gary Thompson, director,
JobsOhio Northwest Region**



“We got offered a lease, but I wasn’t comfortable with it. A paralegal told me to contact Extension, and I got in contact with Steve Schumacher. He set the matter straight. As an outside person who doesn’t have a stake in this game, his word had a lot of influence. it made all the difference in the world.”

— **Fred Schwarz, who is now forming a
landowners group in Licking County**

Energy: A Critical Issue in Ohio

According to the U.S. Department of Energy 2013 EIA Annual Energy Outlook, total U.S. electricity consumption will increase by nearly 22 % by 2040. It is projected that increased generation from renewable energy (excluding hydropower) will account for 32 % of the overall growth in electricity generation from 2011 to 2040. Recent technological advancements in horizontal hydraulic fracturing has allowed for the recovery of unconventional oil and gas deposits from shale formations previously thought to be uneconomical. As a result of domestic shale energy development, the International Energy Administration 2012 Report suggest the United States will overtake Saudi Arabia as the world's biggest oil producer by around 2020.

Due to their abundance of natural resources and extensive open spaces, rural Ohio communities are positioned to play a central role in future energy development. However, energy development presents both opportunities and challenges to the impacted communities. Energize Ohio, an Ohio State University Extension signature program, provides non-biased, research-based information to address critical energy issues impacting Ohioans.

Summary of Energize Ohio 2012 Accomplishments

- 58 - Programs / Workshops
- 3,017 - Program Participants
- 9 - Published Extension Fact Sheets
- 10 - Fact Sheets Under Peer Review
- 1 - Journal of Extension Publication
- 32,318 webpage views by 13,924 unique visitors from all 50 U.S. States and 61 different countries.
- 16 Collaborative Partnerships
- \$27,500 Dollars Generated or Committed for Energy Research, Outreach, and Education

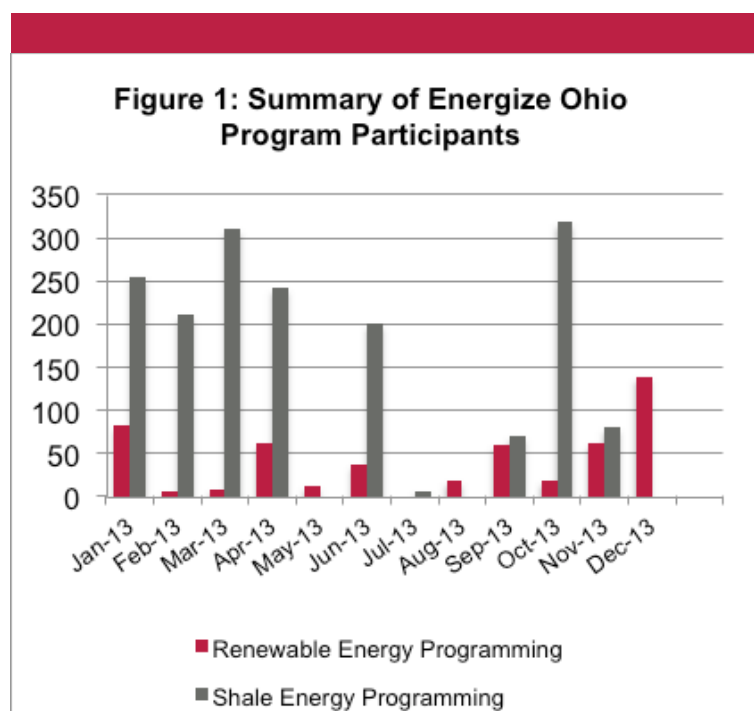
Summary of Energize Ohio 2013 Accomplishments

- 53 - Programs / Workshops
- 2,194 - Program Participants
- 6 - Published Extension Fact Sheets
- 7 - Fact Sheets Under Peer Review
- 1 - Journal of Extension Publication
- 1 - Journal Publication (under review)
- 7 - Peer Reviewed Scholarly Presentations and Posters
- 40,605 webpage views by 16,099 unique visitors from all 50 U.S. States and 96 different countries.
- 28 Collaborative Partnerships
- \$345,240 Dollars Generated or Committed for Energy Research, Outreach, and Education

Energize Ohio Curriculum & Activities

Energize Ohio Signature Program Overview

Energize Ohio is a multidisciplinary program that addresses a wide range of energy education needs including youth education, energy policy, landowner leasing, and sustainable community planning. The curriculum consists of worksheets, presentation materials, workshop materials, bulletins, fact sheets, marketing templates, and evaluation tools. Energize Ohio currently focuses on two core initiatives including shale energy development and renewable energy development.



In 2013, the Energize Ohio Signature Program team members delivered roughly 53 programs reaching more than 2,194 participants.

Figure 1 illustrates the signature program participants itemized by month and program type. Energize Ohio programming was delivered in 38 of Ohio's 88 counties, demonstrating statewide impact. In addition to teaching energy programs, the signature program team was very active in the development of new energy related publications and educational resources including a Journal of Extension article and 6 published Extension fact sheets.

Shale Energy Development

Program Overview

Oil and gas development continued in Ohio in 2013 with the focus remaining on a fairly narrow strip extending from Carroll County to Noble County. Total horizontal wells drilled in the Utica/Point Pleasant shale increased from around 200 in January 2012 to approximately 675 by the end of the year. As wells were being drilled, the region was also seeing a rapid development of midstream fractionation/cryogenic plants designed to remove the “wet” components from the rich gas found in the region. As these plants come on line, it is likely that more wells will be drilled and a spiderweb of pipelines will be installed in the region to move the product from the wellhead, to the midstream processors and finally to crackers and end use consumers. 2012 production figures for the state were over 635,000 barrels of oil and nearly 13,000,000 MCF of gas.

As the development matures, the response from OSU Extension does likewise. Educational efforts started with leasing issues but has now grown to include pipelines, wealth management, and long term community development. In 2013, OSU Extension educators and specialists conducted 29 programs that reached more than to 1,691 people on shale gas-related topics such as legal and financial aspects of leases, water, and environmental issues.

To support landowner education on shale energy, the shale energy team has developed a number of tools to support educational efforts including shale energy fact sheets and 7 Extension workshops that were captured electronically and converted into multimedia programs. Educational tools and publications have been instrumental in supporting Extension outreach and education

efforts as well as providing a strong OSU Extension presence for those searching the Internet for non-biased factual based shale energy resources.

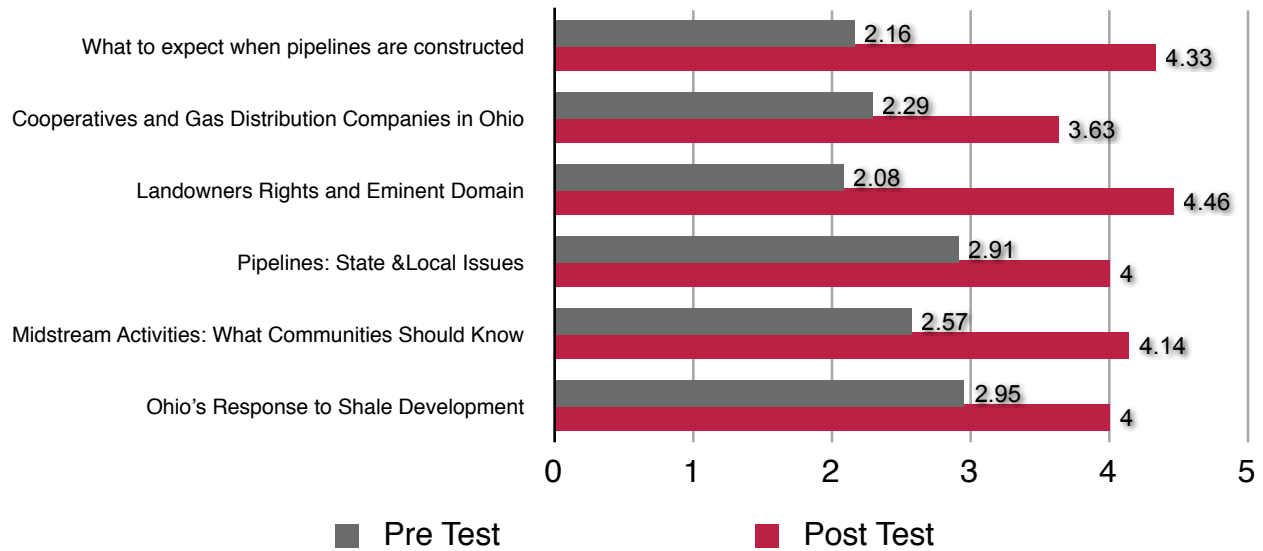
To promote the signature program, build capacity, and identify ongoing collaboration opportunities, the OSU Extension Work Group conducted a Train-the-Trainer Workshop in

September of 2013. This workshop was designed to increase Educator knowledge and help them understand what role they can play in shale energy education.

The full day workshop covered numerous topics including: Pipelines 101, Cooperatives and Gas Distribution Companies in Ohio, Landowner Rights and Eminent Domain, Pipelines: State and Local Issues, Midstream Activities in Ohio, and Ohio's Response. Figure 2: illustrates a summary of the 25 program evaluation surveys collected.

To support Shale Energy Outreach and Education, in 2013, Energize Ohio team members contributed to 3 published Extension fact sheets, 7 fact sheets under peer review, and acquired 2 grants totaling \$332,740.

**Figure 2: 2013 Shale Gas In-service:
Pipelines, Midstream Issues and Cooperatives Program Evaluation**
Level of knowledge
(1=no knowledge, 5=extensive knowledge)



Images from the OSU
Extension *Shale and
You: A Workshop for
Landowners* held on
February 23, 2013 in
Canfield Ohio.



Program Feature

Shale and You: A Workshop for Landowners

*Prepared by: Chris Hogan, OSUE
Agricultural & Resource Law Program*

OSU Extension held Shale and You: A Workshop for Landowners on February 23, 2013 in Canfield Ohio. The workshop was the second of two meetings held thus far as a result of a North Central Risk Management Education Center (NCRMEC) grant titled The Oil and Gas Boom in Ohio: Creating New Risk Management Issues for Farmers. The workshop engaged landowners in an educational experience regarding shale development in the northeast region of Ohio. An emphasis was placed on access to resources available to landowners through OSU Extension, The Ohio Department of Natural Resources, and the Ohio EPA. A wide array of topics surrounding shale development were introduced including legal, financial, environmental, community, and personal impacts.

Extension specialists and county educators coordinated the planning efforts and program development. Extension staff from Agriculture and Natural Resources including Peggy Hall, Steve Schumacher, Chris Penrose, Chris Zoller, Sarah Cross, and Mark Landefeld, as well as staff from Community Development including Mike Lloyd, and staff from Family and Consumer Science including Polly Loy provided assistance in developing the event.

Marketing was conducted online at <http://shalegas.osu.edu> as well as electronic mailings and announcements sent to Extension personnel and outside entities. A

press release was prepared and distributed by Martha Filipic in CommTech.

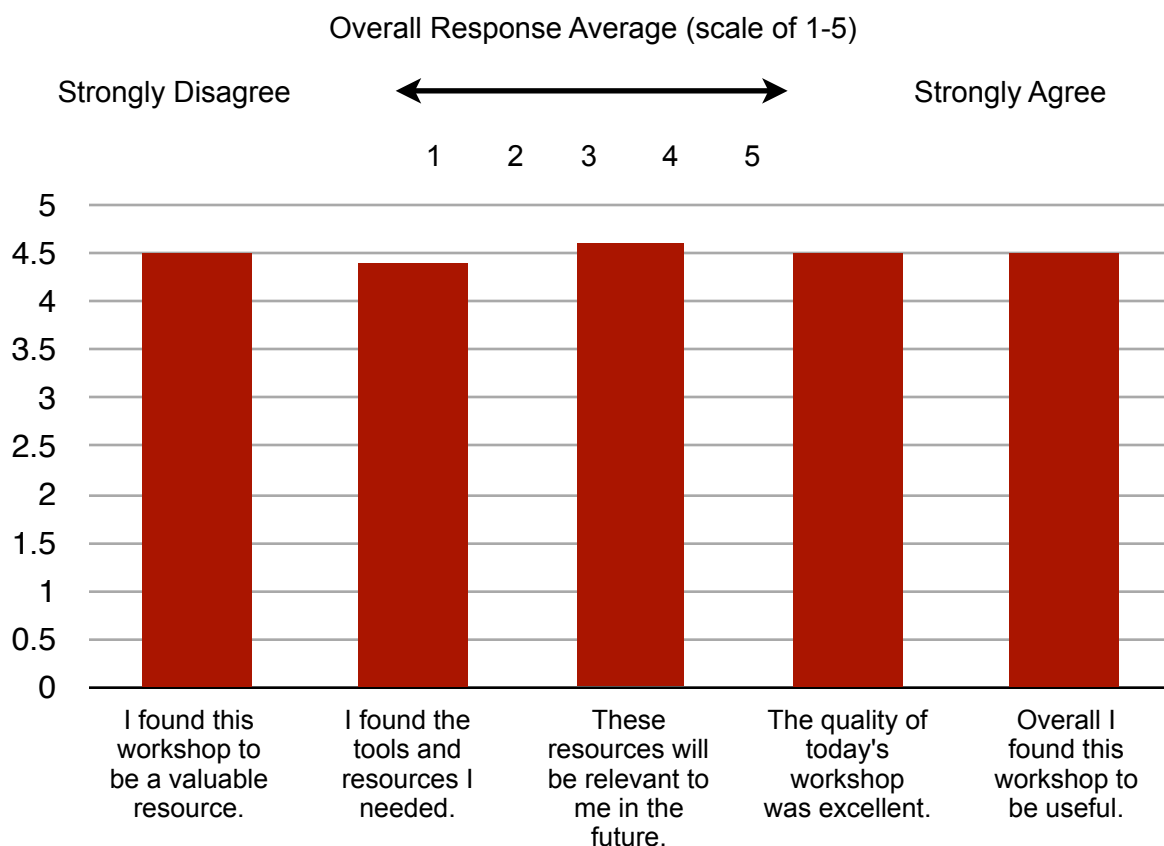
The OSU Extension Agricultural Law Program registered attendees. Attendees paid a registration fee of \$15.00 to defray the cost of refreshments and handouts. Cost of materials developed and Extension educators' travel was covered through the NCRMEC grant.

The workshop was held at facilities at the Mill Creek MetroParks farm and were secured by Eric Barrett of Mahoning County Extension.

Educators presented topics in a theater style setting throughout the day. Extension educators were also available to answer questions through one-on-one interaction. Booths covering a full range of shale topics including community impacts, pipelines, development, leasing, and wealth management were staffed throughout the day to offer educational materials and a chance to speak individually with Extension educators.

In total there were 60 participants in attendance. Program evaluation surveys were distributed and completed by 73% of the attendees. On a scale of 1 - 5 (1 strongly disagree and 5 strongly agree) the overall average evaluation score of the workshop was 4.51. Figure 3: illustrates a summary of all 5 evaluation questions.

Figure 3:Shale and You Workshop - Program Evaluation



Additional open-ended comments from the program evaluations include:

- Good coverage.
- What are typical signing bonus payments and royalties?
- Comfortable and convenient location. Nice to have displays and staff to talk with. Presenters were all concise summaries of “need to know” info. Cost very reasonable. Level of knowledge of each presenter was excellent.
- Great job, the whole day was great. Well owners (Clays) were a great personal touch.
- Appreciate the legal talks.
- Review leases—good and bad aspects.
- Very good job, good info.
- Not enough sugar free soda offered for class.
- It was great.
- Thanks for doing this!
- \$15.00 was a bargain to pay for coming away with the info and resources.
- I do not always give high marks. This truly was an excellent workshop. A little more coffee next time though.

Renewable Energy Development

Program Overview

According to the U.S. Department of Energy 2013 EIA Annual Energy Outlook, it is projected that increased generation from renewable energy technologies (excluding hydropower) will account for 32 % of the overall growth in electricity generation sector from 2011 to 2040. Following the passage of Ohio's Alternative Energy Portfolio Standards in 2008, Ohio has experienced significant growth in renewable energy generation with more than 1,294 certified renewable energy facilities in Ohio accounting for 922 megawatts of electric generating capacity. Renewable energy development presents new social, economic, and environmental opportunities and challenges to landowners, farms, businesses, and impacted communities.

Energize Ohio renewable energy curriculum is designed to enhance community leaders' and local residents' knowledge of energy drivers and development in order to promote best practices and informed decision-making on the implementation of sustainable energy strategies in Ohio's communities, businesses, and farms. Renewable energy topics currently addressed include large-scale renewable energy development, youth renewable energy education, on-farm renewable energy, and distributed renewable energy development.



In 2013, OSU Extension educators and specialists conducted over 23 programs that reached more than 503 people on renewable energy-related topics. To support landowner and community education on renewable energy, the team has developed a number of tools to support educational efforts including 3 new fact sheets, one research project and technical report, and 3 Extension workshops that were captured electronically and converted into multimedia programs. Educational tools and publications have been instrumental in supporting Extension outreach and education efforts as well as providing a strong OSU

Extension presence for those searching the Internet for non-biased factual based shale energy resources.

According to the 2009 USDA On- Farm Renewable Energy Production Survey, it is estimated there are 115 Ohio farms that have installed an on-site

photovoltaic (PV) solar system to generate their own electricity. In response to this growing trend, a team of OSU Extension Educators is currently developing new curriculum materials to provide farmers an overview of Ohio's renewable energy policy, net metering agreements, solar (PV) technology, on-farm solar applications, and a review of Ohio case studies. Our team has already agreed to present on this topic at four agronomy days in the spring of 2014 and as a part of the Ag lenders series in the fall.

Program Feature

Bio-Energy Workshop at the OSU South Centers

In April of 2013, Ohio State University OARDC and Extension collaborated to organize a Bio-Energy Workshop at the OSU South Centers at Piketon. In total, 38 participants from around Ohio and Michigan traveled to the South Centers Campus to learn about opportunities for growing bioenergy crops in Ohio, energy policies that impact this activity, and potential markets for biomass. Following lunch, Rafiq Islam, soil, water and bioenergy specialist guided participants on a walking tour of bioenergy crops on the South Centers Campus. The tour featured different varieties of *Miscanthus giganteus*, *Arundo*, warm-season native grasses, hybrid Willows, and Guayule plantation sites. Figures 4 and 5 summarize the program evaluation results from the full day workshop.



The full-day workshop covered a wide variety of topics including:

- Energy Trends and Policy Overview, Eric Romich.
- Bioenergy Crop Opportunities in Ohio, Rafiq Islam.
- Development & Deployment of Alternative Aviation Fuels in Ohio, Steve Csonka, Executive Director, Commercial Aviation Alternative Fuels Initiative (CAAFI)
- Michigan State University Bioenergy Crop Production and Research, Dennis Pennington, MSU Extension bioenergy specialist.
- Case Study: Ashtabula County *Miscanthus*, David Marrison, OSU Extension educator, Ashtabula County.
- Land Capacity in Southern Ohio, Jeff Fisher, OSU Extension educator, Pike County.
- Guayule Crop Production in Ohio, Katrina Cornish, endowed chair in bioemergent materials, Ohio Agricultural Research and Development Center, Ohio State.
- Bioenergy Crop Field Tours, Rafiq Islam.

Figure 4: Bio-Energy Workshop - Program Evaluation

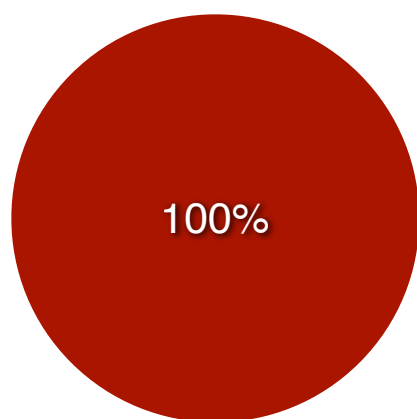
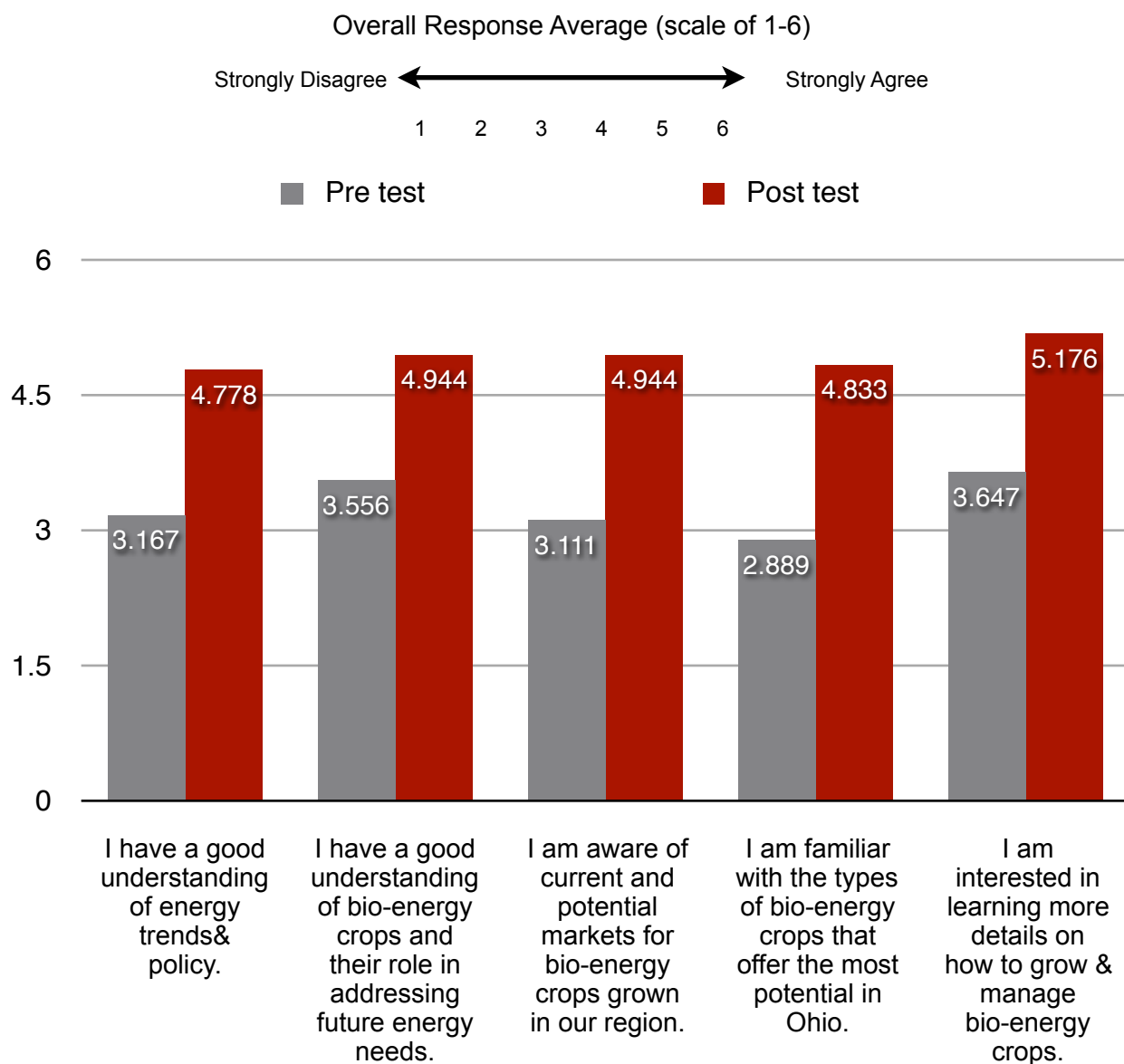


Figure 5: Do you feel today's program provided valuable information that you would recommend to others?

● Yes ● No

Research Feature

Wyandot County Survey of Renewable Energy and Environmental Issues

The 2013 Wyandot County Survey of Renewable Energy and Environmental Issues Project was conducted by a team of Ohio State University faculty and staff with support from The Ohio State University's School of Environment & Natural Resources and the Department of Extension in the College of Food Agricultural and Environmental Sciences. The primary objective of the project was to assess local residents' current knowledge, attitudes, and opinions on emerging and potentially contentious energy and environmental issues.

This research was funded by a collaborative partnership between university, local government, and private industry resources. Specifically, funds which supported this study were acquired from the OSU Extension Community Development Unit, the Social Responsibility Initiative within the School of Environment and Natural Resources, Wyandot County Regional Planning Commission, Wyandot County Commissioners, and EDF Renewable Energy.



In Ohio, an increasing number of utility scale renewable energy projects are being proposed and county commissioners are faced with the important decision of approving or denying an alternative energy zone application. In the case of wind energy, this decision has the potential to generate millions of dollars in local tax revenue, yet will alter the landscape of the community for the next 25 to 30 years. In Wyandot County, Ohio, elected officials were interested in gathering data to better understand how local residents would respond to a proposed wind farm development in the western portion of the county. As a result, this project was designed to gather research-based data to measure knowledge, local support, attitudes and opinions of community residents. The research data will also serve as a needs assessment to guide future outreach and education programs to be delivered in the community.

The primary objective of the survey was to assess local residents' current knowledge, attitudes and opinions on emerging and potentially contentious energy and environmental issues within the community. In addition, a proposed 100-megawatt wind farm in one of the county's townships makes a countywide study especially interesting because it allows consideration of differences between residents located in the development zone and those located elsewhere in the area.

The final 11-page, 45-item questionnaire and mail- out correspondence was submitted to The Ohio State University Office of Responsible Research Practices in spring

2013 for review with an approval received on May 30, 2013. A countywide and area sample of 700 Ohio households was selected and stratified according to zip code status to differentiate between those residents living in the proposed wind farm development area and those that are not. A summary of the study highlights include:

- There is broad support for wind farm development in Wyandot County.
- Opposition to wind farms does exist among respondents, some of which stems from the loss of productive agricultural land.
- There is greater opposition in the proposed wind farm project zone than in other surrounding areas surveyed.
- Over two-thirds of respondents have observed a modern wind farm in operation.
- Less than ten percent of the respondents have been approached about leasing their property as part of a wind farm.
- More than one third of respondents indicated they were unsure if the benefits outweighed the concerns for wind energy development, or vice versa.

In summary, the results indicated that there is broad support for wind farm development in Wyandot County. While 67 percent of respondents support or strongly support having wind turbines in their county, 36 percent indicated they were unsure if the benefits outweighed the concerns for wind energy development, or vice versa. This data suggest that there is still a lot of uncertainty surrounding the impacts of wind development in and around Wyandot County and residents are still seeking information to formulate their opinions.

The final report is posted on the Energize Ohio website and is available for download at: <http://energizeohio.osu.edu/sites/d6-energizeohio.web/files/imce/Wyandot%20Wind%20Survey%20Final%20Report%204.0%20.pdf>

“Due to the state of local government funding, I was a little hesitant to commit county commissioners funds for this study. However, after reviewing the final report I am very glad that we did proceed with this study as it provides us valuable information that will assist us in making critical decisions with lasting impacts on our communities future.”

- Steve Seitz,
Wyandot County Commissioner

Signature Program Marketing

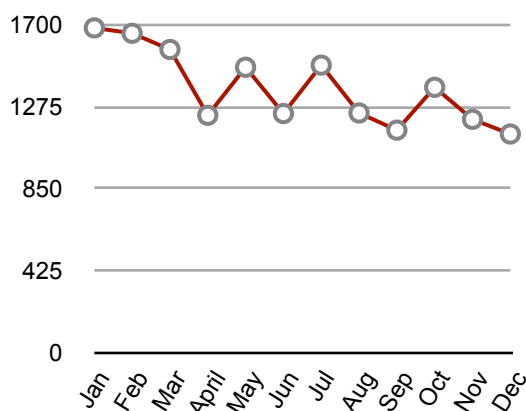
Energize Ohio Website

The Energize Ohio Signature Program website (energizeohio.osu.edu) is a collaborative effort between the Office of Energy, Ohio Development Services Agency and OSU Extension. Since 2012, the Energize Ohio Team has updated critical information in the energy efficiency and renewable energy incentives calculator, developed an interactive flowchart to promote OSU Extension curriculum materials, and built an energy library to share Extension publications, fact sheets, and videos. Current and relevant information was disseminated through 14 energy blogs submitted by 9 different educators. In addition, a strategic and intentional effort was made to create and integrate standardized energy marketing banners into the website pages and materials to support the OSU Extension brand.

In 2013, the Energize Ohio website received 40,605 page views by 16,099 unique visitors (18,999 total visits). As illustrated in Figures 6 and 7 below, the website continues to reach a new audience as 84% of the website traffic is from new visitors. The website received visitors from all 50 U.S. States, the District of Columbia, and international visits from 96 different countries. Analytic results indicate that 23% of the website visitors spent more than 1 minute on the Energize Ohio website.

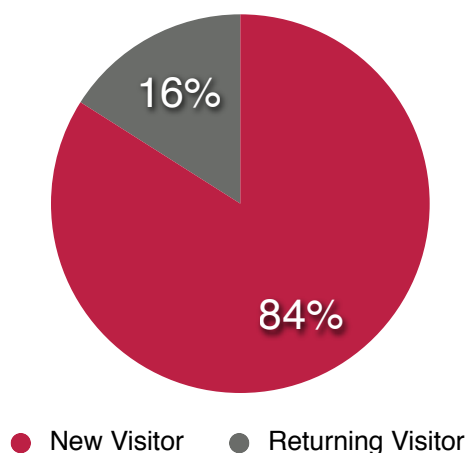
The Energize Ohio website fills a critical need by providing easily accessible unbiased research based information on energy topics to Educators and Ohio residents. In addition, the Shale Energy Website was developed to organize shale programs and teaching tools by topic. Energize Ohio and Shale Work Group team members collaborate closely with the management of both websites to effectively

Figure 6: 2013 Energize Ohio Website Visits



Analytic results indicate that **23%** of the website visitors spent more than **1 minute** on the Energize Ohio website.

Figure 7: Website Traffic





organize materials without duplicating materials, and seamlessly linking the two websites.

CFAES Branding

Recognizing a strong brand is critical to our One University, One College approach, the Energize Ohio team has quickly embraced the new branding standards and guidelines. We have participated in meetings with Communications and Technology to develop strategies to update and expand our marketing materials. Additional materials currently under development include electronic report template, new wallpaper, new powerpoint template, a tri-fold brochure, program folder, and a banner display to promote program materials at workshops and conferences.

Outreach & Engagement

In an effort to promote the program, build partnerships, and identify ongoing collaboration opportunities, the Energize Ohio team has participated in a number of outreach and engagement efforts. For example, the team presented a poster at the Ohio State University Outreach and Engagement Forum at the Ohio Union. In April, 2013, the team presented an overview of the Energize Ohio Signature Program as part of a Plenary Panel session on Statewide Energy Programming at the National Energy Extension Summit at Colorado State University. Poster sessions were also displayed at the OSU Extension Annual Conference and Galaxy Conference to increase knowledge and awareness of the OSU Extension Signature Program. The promotion outreach and engagement fosters discussion among colleagues on how Extension professionals can better share ideas and collaborate to develop materials for energy education, and discuss how existing program materials can be improved upon, shared, and replicated in other regions.

Energize Ohio Cost Recovery

Grant Overview

In 2013, Energize Ohio team members were very active in submitting renewable and shale energy funding proposals to conduct research, outreach, and education. In total, 5 proposals were funded committing roughly \$345,240 to support Extension activities. A significant portion of the funding acquired was for the development and delivery of shale energy education.

While the primary focus of Energize Ohio shale energy programming is currently focused on addressing landowner issues, there is a critical growing need for community level education that addresses the long-term community impacts from development. In response to this need, Energize Ohio team members submitted proposals and obtained two new grants to advance community level educational programming and planning efforts.

The first grant is from the North Central Regional Center for Rural Development and is designed to create educational materials that can be used by local leaders to prepare for and mitigate the immediate impacts of shale developments while taking advantage of revenue generation to build long term community sustainability. This grant is in conjunction with the Extension services in North and South Dakota.

A second grant recently announced is from the U.S. Department of Commerce Economic Development Administration. This project will outline a process to effectively manage the immediate impacts of shale development while leveraging the current economic boom to build a plan, which supports long-term



economic viability and community sustainability. To achieve this, the project team will focus on five core objectives including:

1. Conducting an advanced industry cluster analysis.
2. Industry capacity assessment.
3. Asset mapping.
4. Implementing a sustainable strategic shale energy planning process.
5. Establishing implementation strategies.

Table 1 summarizes the funding proposals, investigators, status, and timelines.

Chart 1: Energize Ohio Funding

Project Title	Funding Agency	Amount	Investigators	Status	Timeline
Wyandot County Survey of Renewable Energy and Environmental Issues	EDF Renewables, Wyandot County Commissioners, Wyandot County Regional Planning Commission, OSU Extension CD, and OSU Environment & Natural Resource	\$7,500	Romich, E., Campbell, J., Moon, G., and Sharp, J.	Funded	2013
Distributed Energy Generation as a BR&E Strategy	JobsOhio	\$2,500	Bowen, N. and Romich, E.	Funded	2013
Preparing Communities for Shale Development through Sustainable Planning	North Central Regional Center for Rural Development	\$20,000	Moss, M., Bond, C., Romich, E., and Bowen, N.	Funded	2013 to 2014
Utility Scale Renewable Energy Development - Project Siting & Conflict Resolution	North Central Regional Center for Rural Development	\$19,968	Romich, E., Hall, P., and Beyea, W.	Funded	2013
Preparing Communities for Shale Development through Sustainable Planning	U.S. Department of Commerce, Economic Development Administration	\$199,766	Bowen, N., Bond, C., Moss, M., and Romich, E.	Funded	2014 to 2016
Maximizing the Gains of Old and New Energy Development for America's Rural Communities	USDA, Agriculture and Food Research Initiative	\$499,777	Partridge, M., Civattolo, D., Faggian, A., Lobao, L., and Romich, E.	Pending	2014 to 2017
Biofuels: Driving Agricultural Entrepreneurship and Innovation	USDA, Agriculture and Food Research Initiative	\$544,003	Hall, D., Bowen, N., Marrison, D., and Romich, E.	Re-Submit in 2014	
Training Professionals on Sustainable Advanced Energy Feedstock Production for Enhanced Ecosystems Services from the Ground Up	Northeast SunGrant Initiative	\$30,000	Islam, R., Cornish, K., Reeder, R., Sundermeier, A., Romich, E., Pennington, D., and Momen, B.	Submitted	

Collaboration

Building Partnerships and Networks

The Energize Ohio Signature Program team seeks internal and external collaboration opportunities to elevate and expand the program. Collaboration opportunities have been leveraged with a number of organizations including, but not limited to:

1. OSU Extension - Community Development
2. OSU Extension - Agriculture and Natural Resources
3. OSU Extension - Family & Consumer Sciences
4. OSU Extension - 4-H Youth Development
5. OSU CFAES - School of Environment and Natural Resources
6. OSU CFAES - Department of Food, Agricultural and Biological Engineering
7. OSU CFAES - Department of Agricultural, Environmental, and Development Economics
8. C. William Swank Program in Rural- Urban Policy
9. OSU Subsurface Energy Resource Center (SERC)
10. OSU Center of Automotive Research
11. Ohio Utility Providers
12. Public Utility Commission of Ohio
13. Ohio Treasures Office
14. JobsOhio
15. Ohio Energy Office
16. Ohio Department of Natural Resources
17. Ohio Farm Bureau
18. Ohio Bio-Products Innovation Center (OBIC)
19. Ohio Sustainable Agriculture Research and Education Team
20. Michigan State University Extension
21. Purdue University Extension
22. Penn State University Extension
23. West Virginia University
24. Colorado State University Extension
25. University of Wyoming Extension
26. South Dakota State University
27. North Dakota State University
28. University of Illinois Extension

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



Energize Ohio
An Ohio State University Extension
Signature Program

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