



# Farm Energy Success Stories

Good for Farm Income, Good for Rural Economic  
Development and Good for Our Environment



ENVIRONMENTAL LAW & POLICY CENTER



# Farm Energy Success Stories

Good for Farmer Income, Good for Rural Economic Growth and Good for Our Environment 

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## Bipartisan Support of the Rural Energy for America Program (REAP)

**SEN. CHUCK GRASSLEY (R, Iowa):** *“Farmers are always looking for ways to make the most of natural resources. The Rural Energy for America Program (REAP) helps farmers use what’s at hand to produce homegrown, clean, renewable energy. It’s an attractive program for efficiency and environmental reasons.”*

**SEN. AMY KLOBUCHAR (D, Minnesota):** *“Farmers have a strong desire for using modern clean technology to produce energy from agriculture’s abundant renewable resources. They use REAP to produce clean energy and energy savings, along with new opportunities for diversified and increased farm income, jobs and improved stewardship of our natural heritage.”*

**REP. TOM LATHAM (R, Iowa-3):** *“The Rural Energy for America Program (REAP) provides a unique public-private partnership. The program has leveraged billions of dollars of private investment in our rural communities. REAP helps rural electric cooperatives erect wind turbines, small businesses reduce energy costs and farmers invest in bio-energy production facilities and add solar panels to their buildings. Because of REAP, America’s rural communities are producing more renewable energy and being more energy efficient.”*

**SEN. DEBBIE STABENOW (D, Michigan), Chairwoman, U.S. Senate Committee on Agriculture, Nutrition & Forestry:** *“The Rural Energy for America Program (REAP) is one of the most effective energy programs in the Farm Bill. Thousands of farmers, ranchers and rural small businesses now produce renewable energy or have made their operations more energy efficient with this initiative. This is very important for our rural economies and for our long-term energy independence.”*

**SEN. JOHN THUNE (R, South Dakota):** *“Each new generation of farmers demonstrates a growing interest in using modern technology to produce energy from agriculture’s abundant renewable resources. Farmers use REAP and a variety of other incentives to produce clean energy and energy savings, and to develop new opportunities for diversified and increased farm income, jobs and improved stewardship of our natural resources.”*

**REP. TIM WALZ (D, Minnesota-1):** *“Farmers have a strong desire for using modern clean technology to produce energy from agriculture’s abundant renewable resources. They use REAP to produce clean energy and energy savings, along with new opportunities for diversified and increased farm income, jobs and improved stewardship of our natural heritage.”*

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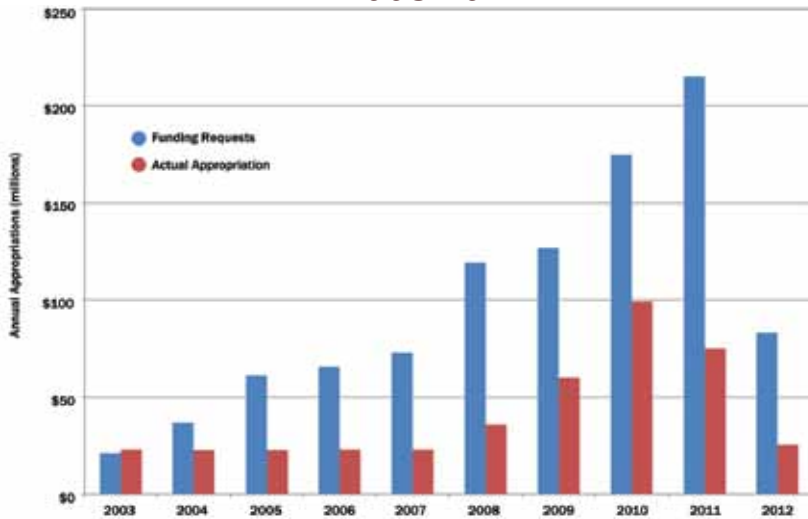
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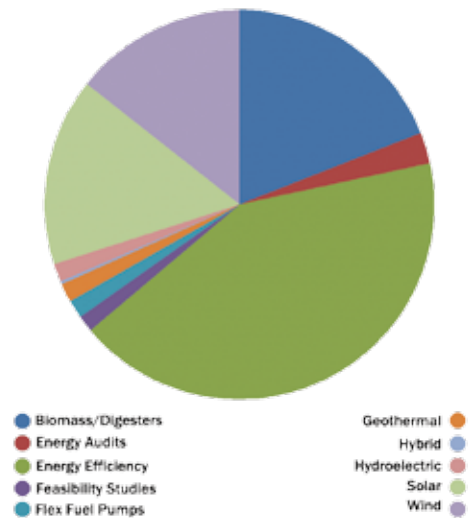
# Overview: Rural Energy for America Program (REAP)

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**REAP Popularity & Funding 2008-2012**



**Total REAP Awards 2008-2012**



## Rural Energy for America

American agriculture has abundant renewable resources that can be used to produce electric power, heat and fuel through a wide range of emerging and market-ready modern technologies. Increasingly, farmers and ranchers produce renewable energy along with food.

The Rural Energy for America Program — REAP — uniquely accelerates development of a broad range of renewable energy and energy efficiency technologies that serve every state and all of agriculture. REAP provides competitive grants and loan guarantees to cover a portion of project costs. REAP was created in the 2003 Farm Bill and renewed and expanded in the 2008 Farm Bill. REAP has sparked a renaissance in renewable energy production across the country benefitting farms, rural economies and the entire nation.

Under REAP, farm energy development and innovation surged in many ways. For example, REAP sparked impressive growth in farm digesters that convert manure to energy and other products while reducing waste. More farmers now harvest the winds blowing over their fields, and many

even own a stake in the turbines on their land. Farmers always harvested solar power in the form of food crops and now they are increasingly tapping the sun for thermal and electric energy. Energy efficiency helps farmers save money by cutting energy waste and pollution with modern technologies and conservation strategies.

REAP is a popular program with applications from farmers, ranchers and rural small businesses regularly exceeding appropriations because it encompasses a wide range of technologies, including energy efficiency, wind turbines, solar panels, thermal solar, geothermal, anaerobic digesters, biomass energy and biofuels. The 2008 Farm Bill added tidal, wave, ocean thermal and small hydroelectric technologies. The broad technology support opens doors of opportunity widely to all agricultural sectors in all states.

## REAP Means Stronger Profits for Agriculture & Jobs for Rural Economies

REAP energy efficiency and renewable energy projects increase farm income by cutting energy bills and increasing and diversifying farm income. Small renewable energy

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systems cut energy bills while larger systems produce new and diversified income from energy and byproduct sales. Rural small businesses have used REAP to cut their operating costs, helping many to stay in business and compete.

An added benefit of REAP is that it helps to attract a new and younger generation of farmers that embraces the opportunities presented by REAP to modernize farm operations, cut costs, increase revenues and provide renewable energy to society.

## REAP Means More Jobs & Energy Security

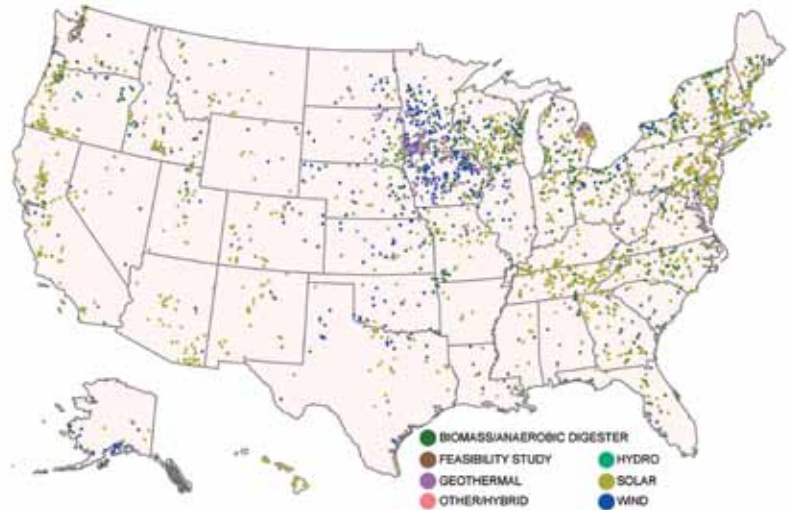
REAP addresses multiple policy goals in several areas — jobs and economic development, energy security and environmental stewardship. REAP investments foster new jobs, expand business opportunities and create new markets.

REAP improves local economies through a variety of new jobs, including system design and development, installation, operation and maintenance. REAP creates jobs at a relatively strong rate: 18.5 jobs per million dollars invested. REAP leverages modest public cost-sharing to spark greater private investment in rural communities: the USDA estimates over \$1 billion in private investment in REAP projects from 2008 to 2012, creating or saving over 18,000 jobs.

REAP provides environmental and public health benefits with reduced fossil energy production and consumption, reduced water consumption for energy production, and less air and water pollution. While markets alone do not reward environmental benefits from clean energy development, REAP program investments reflect those benefits, while generating economic development.

REAP increases our energy and national security through

## REAP Renewable Energy Projects 2008-2013



## REAP Energy Efficiency Projects 2008-2013



development of homegrown renewable resources. Distributed renewable energy production is inherently more resilient to supply interruption.

REAP delivers broad value to agriculture, rural communities and our nation far beyond its cost. It has been a successful program that has served the entire nation and should be renewed and well funded.

# Farm Energy Success Stories

## FROM THE NORTHEAST

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**T**he diverse agricultural producers and rural small businesses of the Northeast have used REAP for innovative clean energy projects for farms, dairy farms, syrup producers, orchards, vegetable and horticultural growers and more. From 2008 to 2013, more than 900 projects received over \$38 million in grants and \$19 million in loan guarantees, leveraging \$150 million of private sector investment. Projects included more than 300 energy efficiency upgrades to cut input costs as well as more than 400 new solar, anaerobic digester, wind, hydroelectric and other renewable energy projects. New York and Vermont led the way with the most new projects; Maine boasted the most diverse array of technologies; and Pennsylvania added an impressive 36 solar projects in 2011 alone.

### Solar

#### Frankferd Farms Foods Saxonburg, PA

**Grant: \$19,500**

**Technology: Solar**



A 2011 REAP grant of \$19,500 helped T. Lyle and Betty Ferderber install their second solar electric system at Frankferd Farms Foods, a regional wholesale and retail organic food distributor.

Earlier that year, Frankferd Farms Foods completed a solar project to power their farm, farmhouse and what they believe to be the world's first solar-powered flour mill. It didn't take long for them to pursue their second solar project. "Our first two weeks of experience were so rewarding, we said 'we're going to go for it again,'" T. Lyle said.

With a REAP grant reducing the cost by 25%, they added a second solar array: a 16.1 kW, American-made system that powers the walk-in coolers and freezers, lighting and computers in their warehouse. The system reduces their monthly electricity bills by about 20%.

T. Lyle says he believes installing renewable energy systems helps demystify them to the public. "We're here to say we can do this. It works. And if more people understood that, we could slowly but surely lessen our impact on the environment as a culture and society," he said.



He sees their solar arrays as cost-effective, long-term investments that contribute to greater American security and energy independence, but T. Lyle said the sense of pride he gets from having the systems is of equal benefit.

“There’s a certain amount of peace of mind that comes with creating something of your own that benefits not only you, but the immediate area around you,” he said. “We lessen the impact of energy on all of our neighbors, and we do it in a very clean way.”



## Vermont Wood Pellet Company

Clarendon, VT

**Grant:** \$50,000

**Loan Guarantee:**  
\$100,000

**Technology:** Biomass

**Biomass**

The beautiful fall foliage for which northern towns like Clarendon, VT, are best known might be worth another look. These forests are growing jobs and offsetting the need for millions of gallons of fuel oil.

Chris Brooks, CEO of Vermont Wood Pellet Company, has witnessed these benefits firsthand. Vermont Wood Pellet designed its community-scale plant to produce up to 20,000 tons of high-BTU fuel pellets. Brooks says they sized the plant to fit the local wood supply. They use softwood and low-grade timber culled from managed forest lands in a 30-mile radius of the plant and sell to local retailers. The plant helps farmers; when farm incomes fall, local farmers cull their own woodlots to sell to Vermont Wood Pellet.

The fuel pellets are used in high-efficiency (80-85%) space heating stoves or furnaces, often automated to feed the

fuel. Vermont Wood Pellet tries to eliminate fossil fuel use throughout its operations, as well as helping customers cut fossil fuel use.

After just two years, demand for the company’s fuel pellets exceeded their production capacity. The company applied for a REAP grant to build a triple-pass drum dryer and upgraded air system, significantly expanding their capacity. A \$50,000 REAP grant helped finance 25% of the cost and a \$100,000 loan guarantee helped secure a bank loan. This expansion offsets an additional 800,000 gallons of fuel oil use every year, increasing the total annual oil offset for the company to about 2 million gallons.

Vermont Wood Pellet’s expanded facility created eight new jobs in the mill and approximately four times that number of additional jobs for loggers and truckers.

# Farm Energy Success Stories

## FROM THE MIDWEST

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**H**undreds of renewable energy and energy efficiency projects crop up every year in the heart of the country. REAP has advanced locally owned wind farms, manure digesters, solar power and thermal systems. From 2008 to 2013, over 2,400 grants were awarded to Midwestern farmers and small businesses, with most of those for energy efficiency investments that increase farm income. The projects included more than 300 solar projects, 130 wind projects and 100 geothermal projects. Michigan was the regional leader in solar, adding nearly 100 new systems to harvest the sun for heat and power.

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### Beebe Community Wind Farm, LLC

Ithaca, MI

Wind

**Grant:** \$50,000

**Technology:** Wind



Mark Hull put his background in farming and engineering to work by building a wind farm in his community, with the help of REAP. He began in 2007 by holding neighborhood meetings, speaking with developers and experts, and organizing a community trip to a wind farm in a neighboring county. He dedicated himself to getting the community educated and excited about the project.

In 2009, Hull secured a \$50,000 REAP grant covering 25% of a feasibility study. That information increased the reliability of wind speed data and made the project more attractive to developers. Today, the 34-turbine, 81-MW wind farm is commercially viable and exceeding production expectations.

Hull says he saw the wind farm as a way to revive the local economy. “The main reason [I pursued the project] was to help my neighbors out,” he said. Hull focused on his community throughout the project’s development, from using local labor for construction to working with the landowners to develop a “farmer-friendly lease.”

Hull highlights benefits to farmers and the local community through turbine lease payments. Hull said many of the landowners are confident this will help to pass viable family farms on to the next generation. “We’re going to see these turbines here forever now,” he said. “I feel like I’m leaving a legacy in the community. It’s all good. It’s all positive.”





## Reid Dairy Farm, LLC

Jeddo, MI

**Grant:** \$39,179

**Loan Guarantee:**  
\$70,000

**Technology:** Solar

Solar

With the help of his brother and son, James Reid has grown the family farm from a 50-head dairy farm in 1978 into a 1,100-acre farm with 205 milking cows.

Reid's commitment to resource conservation and sustainable farming led to an interest in using renewable energy on his farm. He ultimately chose solar technology because he saw solar panels as low maintenance — and, as a farmer, he already had plenty of equipment to maintain.

At the outset of the project, Reid's family knew their power company offered renewable energy incentives, but Reid said discovering REAP was what really made the project possible. "It was sort of a tipping point," he said. "We really needed that additional incentive to go forward with it."

In 2010, the farm received a \$39,179 grant, covering 25% of the project cost, as well as a \$70,000 loan guarantee, to install a 19.68 kW solar panel system on the roofs of the dairy barns. Since installing the panels, the farm's electricity

bills have decreased by about 30%. They expect a return on investment in 5-6 years and for the system to protect them from escalating utility energy costs.

Reid believes clean energy projects like his are important because they protect the environment, put national energy independence within reach, and reflect positively on farmers

and their communities. "[These projects] show that farmers are being innovative, that they are using the latest technology," he said.

Reid drew a comparison between conservation farming and harnessing renewable energy.

"We are always trying to find ways to recycle things," he said. "When farmers are cropping, we're trying to conserve the soil and recycle the nutrients. The plant material, the organic material that we aren't harvesting — those are left on the ground to make the soil better. Using renewable energy is sort of the same. We're trying to reuse nutrients — to utilize the energy from the sun — to power what we need here on the farm."

*Since installing solar panels, this dairy farm's electricity bills have decreased by about 30%. They expect a return on investment in 5-6 years and are excited to "show that farmers are innovative."*

continued...  
FROM THE MIDWEST



# Digester

**Ringler  
Energy, LLC**  
Cardington, OH

**Grant: \$500,000**

**Loan Guarantee:  
\$2,750,000**

**Technology:  
Anaerobic Digester**



The Ringler family has been raising pork throughout Ohio and the Midwest for three generations. The renewable energy arm of the family operation, Ringler Energy LLC, received a \$500,000 grant and a \$2.75 million loan guarantee in 2011 to build an anaerobic digester that creates electricity from their livestock manure. Alex Ringler, who spearheaded the project, said this is all part of living up to the company's slogan, "progressive agriculture."

"I am always focused on making decisions that will secure our farm's sustainability. I want to pass this operation on to our fourth generation, my sons," he said. "Anaerobic digestion is going to play a big role in securing this future, and I enjoy being at the forefront of something new and exciting."

The 800 kW farm digester powers the entire farm, turning waste into energy while reducing farm odors and creating a liquid fertilizer byproduct used by local farmers. Approximately 10-15% of the energy produced is used to run the anaerobic

*"I want to pass this operation on to our fourth generation, my sons. Anaerobic digestion is going to play a big role in securing this future, and I enjoy being at the forefront of something new and exciting."*

digester and farm, while the rest of the electricity is sold back to the utility grid.

"To stay competitive, we need to consistently progress," he said. "Modern farmers have to explore new opportunities and new technologies that allow us to live in harmony with our neighbors, our consumers and the environment."

Phase II of the Ringler Energy biodigester project will include the installation of biogas upgrades and compression equipment that will produce compressed natural gas for use as motor vehicle fuel. They plan to use most of the fuel to power their fleet of 40 trucks, with an expected reduction in fuel costs of one- to two-thirds. This is a good example of how REAP funds are helping American agriculture produce new sources of fuel and lead to greater energy independence.

Ringler said this project would not have been possible without the incentives from REAP. "REAP funding rewards farmers who are forward thinking and working to build a sustainable future for America's agriculture industry," he said.

# Farm Energy Success Stories

## FROM THE PLAINS



The prairies and croplands of the Plains are known as the country’s wind corridor, boasting the highest number of REAP-funded clean energy projects from 2008 to 2013, including nearly 200 wind projects. The region also added the highest number of geothermal projects: 110. During this period, more than 2,700 projects were funded in the Plains, though the average grant was just over \$23,000, the lowest average for any region. Farmers and rural small businesses in the resource-rich Plains are making investments that help their individual operations, but also benefit their communities and country. In North Dakota and South Dakota, the seed was laid for future project developments with cost-share feasibility study grants for wind power and biomass. Iowans pursued more than 1,500 projects that utilized diverse technologies, including anaerobic digesters, energy efficiency, geothermal, solar and wind. Kansas farmers and rural small businesses also used REAP for diverse projects, such as energy efficiency, solar, geothermal and wind.



### FlagShooter, LLC

Garretson, SD

Wind &  
Solar

Grant: \$38,638

Technology:  
Wind & Solar

Paul Carrette founded his company, FlagShooter LLC, in rural Garretson, SD, based on an invention that saves time and energy for companies that identify buried utilities. The FlagShooter is a device that secures marking flags into the ground — a task usually done by hand. Carrette said many of their customers seek to reduce their carbon footprint. This, among other reasons, encouraged him to explore tapping

renewable energy. He decided to install a 20 kWh hybrid wind and solar project in 2012, with the help of a \$36,000 REAP grant that reduced project costs by about 22%.

Carrette brought the same “can-do” spirit that built his company to building renewable power. He said installing a renewable energy system was a sensible long-term investment that, with the availability of REAP funding,

would help FlagShooter stay cost competitive despite rising electricity rates.

“I’ve always thought that renewable energy was unique, but out of reach,” he said. “But with the grant money, that put [the project] in reach and was a major factor in moving forward ... It’s great to be able to see that my electric bills have gone down substantially even though my business is expanding.”

Carrette said the solar panels and wind turbine are both producing more electricity than expected. Many days, FlagShooter operates completely independent of the grid, producing 100% of its own electricity. He estimates this has

saved the company 60-70% on their electricity bills.

“Renewable energy is no longer a novelty for people; today it actually makes good business sense,” he said. “The payback gets better every year.” He chose a hybrid wind and solar approach to get the benefits of both. To keep up with the company’s growing demand and because their first project was so successful, FlagShooter plans to install another set of solar panels within the next 5 years.

## Luther College Wind Energy Project, LLC

Decorah, IA

Wind

**Grant:** \$500,000

**Loan Guarantee:**  
\$1,300,000

**Technology:** Wind



If you happen to drive through northeastern Iowa, you will know when you’ve arrived at Luther College by the spinning wind turbine overlooking campus. Luther is a small liberal arts institution that has made sustainability central to their campus experience.

In 2005, the college created Luther College Wind Energy Project LLC (LCWEP), a for-profit subsidiary of Luther College, which is the project’s sole investor. The new LLC focused on sustainability projects and qualified for state and

federal clean energy incentives, including REAP.

REAP awarded LCWEP a \$500,000 grant and a \$1.3 million loan guarantee in 2009. They purchased a 1.6 MW turbine, which is currently generating around 4 million kWh per year, providing nearly 30% of the college’s electricity consumption.

“We got very serious about our project as soon as we got the REAP grant,” said Jim Martin-Schramm, a professor of religion at the college who worked closely on the project.



Martin-Schramm said the college pursued the project for economic as well as environmental reasons. As an early signatory of the American College and University President's Climate Commitment (ACUPCC), the college is committed to reducing its carbon footprint by 50% by 2015 and to achieving carbon neutrality by 2030. Thanks in part to the wind turbine, Luther College has already achieved a 33% reduction since the 2003-2004 school year.

Martin-Schramm teaches courses on energy and said the learning experience and public visibility of the turbine have been major benefits for the college.

"[Wind turbines] are iconic," he said. "It puts us on the map in a way that you just can't deny, and it is a wonderful teaching

tool. Its educational value has been huge."

Luther College is leading the way in renewable energy and energy efficiency projects, and REAP has been a part of that story. Martin-Schramm is enthusiastic about the efficacy of REAP funding.

"The energy that blows over our land and bathes our crops in the sun increases economic resilience by recycling economic benefits in the community," he said. "Investments in renewable energy technologies promote energy independence, environmental well-being and economic development."



## Reed's Food Center

Arnold, NE

**Grant:** \$49,352

**Loan Guarantee:**  
\$98,704

**Technology:**  
Energy Efficiency

Efficiency

When rising energy costs threatened to put Reed's Food Center out of business, owner John Reed began to explore options for energy efficiency upgrades. What began as a plan to upgrade the freezers became a much bigger project, including efficiency upgrades to all the case exteriors and the refrigeration compressor.

Reed said that discovering a state tax incentive and the

federal REAP grant opportunity made him decide to pursue more extensive upgrades. The project received a \$49,352 grant and \$98,704 loan guarantee from REAP in 2010.

After installing the new energy efficiency equipment, the store's energy use decreased by 55-60%, lowering Reed's energy bills by up to \$20,000 annually. Reed estimates that they also saw a 10-20% uptick in sales because the modern

continued...  
FROM THE PLAINS



upgrades attracted customers. Reed believes that the REAP grant and state tax incentive made it possible for him to keep his prices competitive and stay in business.

Reed and his wife have called the City of Arnold home since 1979, when they first opened Reed's Food Center. He said part of his motivation to pursue the project was to give his neighbors a nice place to shop with good variety and to keep

local dollars in Arnold.

For others considering similar projects, Reed offers encouragement and says nearby store owners who have seen the results at his store have chosen to upgrade. "It's the small operators that are the engine of this country," he said. "Don't be scared, just do it," he said. "[REAP] is money well spent. Look at all the benefits — it'll more than pay for itself."

Geothermal

## Victor's Market Victor, IA

**Grant:** \$20,000  
**Technology:**  
Geothermal



When the only grocer in Victor, IA, closed for business, Susan Wilgenbusch and her husband decided to open their own store. Susan bought a 90-year-old gas station in town and built a bigger building on the site, which now houses a grocery store and a kitchen.

Wilgenbusch and her husband, both lifelong conservationists, wanted to install a geothermal heating and cooling system to heat their new building and its water. Wilgenbusch said the geothermal system is clean because it saves energy, is easy to maintain, is cost-effective, and, most importantly, keeps the store and its customers comfortable year round. She said the energy efficiency of the geothermal system made their bills much more manageable and could be one of the reasons they have been able to stay in business and employ 16 people.

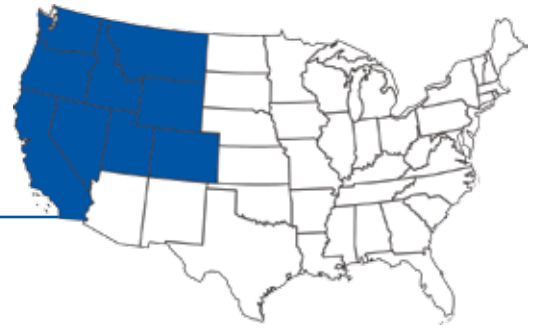
Wilgenbusch said REAP was the reason they were able to afford the project. They received a grant for \$20,000 in 2009. "[The REAP grant] might be one of the reasons we're still in business," she said. "It just made it a great deal for us."

Wilgenbusch said her favorite part of the project is that using clean, efficient heat gives them something to feel good about. Since their positive experience with the REAP project, they have continued to make energy efficiency upgrades, such as high-efficiency LED lighting, to their store.

"We're using our environment wisely," she said. "We're making Victor a better place."

# Farm Energy Success Stories

## FROM THE NORTHWEST



The mountainous Northwest led the country with 20 REAP-funded small hydroelectric projects between 2008 and 2013. Overall, the Northwest region added more than 700 REAP projects, with the most for solar projects. The Northwest boasts the highest technological diversity and the most feasibility studies funded — 44 — that addressed a wide range of technologies available to benefit the region.



### Ballard Family Dairy & Cheese

Gooding, ID

**Grants:**  
\$23,213 &  
\$30,922

**Technologies:**  
Efficiency & Solar

Efficiency  
& Solar

In the face of an economic downturn and rising energy costs, Steve Ballard at Ballard Family Dairy and Cheese in southwest Idaho decided to take action to lower his energy costs. Without access to natural gas, propane to heat water and space cost them about \$30,000 per year. Energy was the second highest cost of production, after feed for their 100 dairy cows, and the cost they could best control.

In 2008, Ballard began researching and consulting with the USDA and received an energy audit from Idaho Power to identify the best energy improvements. Ballard chose a five-prong strategy that included three-phase power, a highly-efficient variable speed vacuum pump, a geothermal heat pump and solar thermal system, and LED lighting at the dairy and cheese plant. To help fund this project, Ballard received a \$23,213 solar REAP grant and a \$30,922 REAP

grant for energy efficiency in 2011.

In total, Ballard's business reduced its annual energy consumption by 67%, carbon footprint by 121,500 pounds, and utility bills by \$15,000. For this achievement, the Ballard Family Dairy and Cheese received the USDA's Dairy Sustainability Award in 2013.

According to Ballard, REAP is essential to project development: "You can do all the research in the world, but to get projects up and operating, that funding is the next step. If it isn't there, you aren't going to get the technical knowledge to make it work."

## Flathead Lake Cheese Polson, MT

Grant: \$9,222

Technology: Solar



After losing their jobs in the wake of 9/11, Wendi and Joe Arnold left their home in Arizona and headed north to Montana on a quest to become cheesemakers, building on Joe's Wisconsin childhood. They named their business after the lake near their new home in Polson, and Flathead Lake Cheese was born, along with a one-of-a-kind REAP project.

Learning from a neighboring car wash that installed a solar thermal system to heat their water, the Arnolds explored a solar project for their new business. They had already employed energy efficient innovations, such as a flat plate heat exchanger to recover and reuse heat from milk while cooling it. Using clean solar energy was the next step.

Their solar project plans grew from an initial idea to heat water to a more expansive proposal to use solar heat for

pasteurizing their milk. Their goal is to produce cheese using entirely solar pasteurized milk. The Arnolds believe they are the only solar pasteurization project in the country.

Flathead Lake Cheese received a \$9,200 grant in 2010 to install a five-panel solar thermal system on the roof of their bright yellow building.

"In addition to saving money on energy, the solar project also helped to give us an identity," Joe said. "It's something we believe in. I see it as a good business move." The project delivered

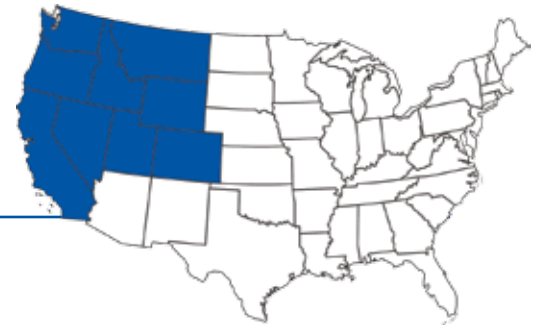
other side benefits, such as saving on space for boilers.

"The technology is only going to get better when there's more people like us seeing what solar can do — not just what it does right now," Wendi said. "We've been able to prove that even in northwest Montana, we still have enough solar energy to use this system. We find that very exciting."

*"In addition to saving money on energy, the solar project also helped to give us an identity ... We've been able to prove that even in northwest Montana, we still have enough solar energy to use this system. We find that very exciting."*

*~Wendi & Joe Arnold*





## Gunnison County Electric Association

Gunnison, CO

**Grant:** \$73,890

**Technology:**  
Energy Audit

Energy Audit

Gunnison County Electric Association (GCEA) formed in 1938, when a group of ranchers joined together to bring electric power to the Colorado's Gunnison Valley. This same pioneering spirit continues today at GCEA, where they continue to look for innovative solutions to meet their customers' energy needs. The cooperative provides service to over 10,000 homes, has a membership of about 7,900 and employs 40 people.

REAP funding, in the form of a \$73,890 grant, helped GCEA launch, organize and equip an energy audit program for rural small businesses that ran from January 2010 to August 2012. The REAP grant and matching funds from GCEA provided cost-sharing for energy audits for local businesses, which were then responsible for just 25% of the cost. GCEA audited 38 businesses over the course of the program.

Following the energy audit program, an evaluation on behalf of the cooperative determined that audited businesses saved an average of 13,000 kWh per year for a total annual reduction of 150,000 kWh. The average business saw its electricity bill decrease by \$450 per month — or \$5,400 annually.

In addition to the energy audit initiative, GCEA has pursued a number of clean energy projects in recent years. Vicki Spencer was hired by GCEA in 2008 to spearhead the creation

of energy efficiency and renewable energy programs. Due to the strong conservation ethic in their region, she said many members "wanted to see us doing more to reduce our carbon footprint in our area."

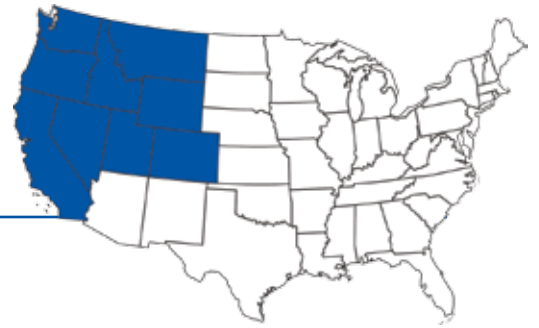
REAP funds also helped cover promotion, training and labor costs for the program. The audit program resulted in four jobs, and Spencer estimates that it saved an additional 15 jobs in the community through energy savings and various partnerships.

"It truly makes a difference in our small community," she said. "It's hard to find well-paying, long-term, steady jobs, and so [REAP] really did make a difference."

Though the formal program has ended, the benefits of the grant continue. Because the cooperative now has a trained auditor, all the equipment needed to perform audits, and the experience helping local businesses save on their energy bills, GCEA is now able to offer commercial audits at no cost.

"These programs are very important in rural communities, where we have greater challenges than in urban areas that have more resources available at lower costs," Spencer said.

continued...  
FROM THE NORTHWEST



Hydro

## Turnbull Hydro LLC

Fairfield, MT

Grant: \$500,000

Technology:  
Hydroelectric



Since the early 1900s, farmers have utilized irrigation systems to water their crops in the Greenfields District of Montana. Yet much of the power potential from the water flowing through irrigation drops and canals has gone to waste. In 2010, Ted Sorenson decided to use his 30 years of engineering experience to utilize the hydropower of two of these canals: Upper Turnbull and Lower Turnbull.

In 2010, Ted and his team received a \$500,000 REAP grant and leveraged over \$11 million to complete these projects, which were fully operational beginning in the summer of 2011. The two facilities together now generate about 13 MW of energy, a source of power that had gone untapped for the last 80-90 years.

“I like the concept of making something out of nothing,” Sorenson said. “Because there was no energy associated with the canal drops [before] .... we created revenue for my family and my partners’ families, 100-150 jobs for a couple years, revenue for the Greenfields irrigation district as well as property for the county, and economic activity during the recession.”

Sorenson said he pursued the Turnbull project because irrigation hydropower is a clean source of renewable energy with minimal environmental impact. These projects are

non-consumptive, meaning they do not consume any of the water intended for use by farmers in irrigation.

In addition, the Turnbull projects generate power during peak irrigation season. When the weather is hotter and the need for irrigation is higher, Upper and Lower Turnbull provide a steady source of power during these periods of high demand.

Sorenson believes hydropower is also environmentally benign to local flora and fauna, as no noticeable impacts have been observed since the project’s completion in 2011.

Turnbull Hydro is an example of how to use existing structures to generate renewable energy for the benefit of the local region, economy and environment at a low operational cost.

For Sorenson’s team, the funding they received from the REAP program was essential to the project: “We were teetering right on the edge of ‘do we do this or not?’ And the REAP [grant] was the last bale of hay on the wagon that said ‘yes, we’re gonna do this.’ It was instrumental — hydroelectric is very capital intensive, and this made us feel better about our investment in the long term.”

# Farm Energy Success Stories

## FROM THE SOUTHWEST



The Southwest added over 300 new clean energy projects that will add to the landscape of deserts, mountains, plateaus and canyons. From 2008 to 2013, the Southwest had the highest grant average of any region — just over \$40,000 per project, ranging from \$9,000 to \$460,000. Solar received the most funding — over \$3.3 million, or about 35% of overall funding for the region — but projects in the Southwest were diverse, spanning nine different technologies. Texas alone pursued nearly half of the region’s total projects; Oklahoma led the way in biomass projects; and Arizona was the leader in solar.



### Haley Farms

Roswell, NM

Solar

Grant: \$292,000

Technology: Solar

As a major producer of pecans outside of Roswell, NM, Haley Farms faces rising utility bills because of the energy required to irrigate its land. With the help of a \$292,000 REAP grant, Haley Farms was able to successfully install a large photovoltaic solar electric system on almost 3 acres of land that were unsuitable for pecan trees.

The 350 kW system pumps irrigation water throughout the 260-acre farm. The pump runs 23 hours a day during the 8-month pecan season. During the 4-month winter season, the power generated by the system is sold back to the grid. Now,

*The Haleys went from paying \$5,000-\$6,000/month for irrigation electricity to selling power back to the grid.*

instead of paying \$5,000 to \$6,000 per month for irrigation electricity, the Haleys are actually generating income from power sales to their utility while the community and country benefit from pollution-free electric power.

Although he had previously considered a solar project, Haley said the up-front costs were too high. Learning about REAP funding was “icing on the cake.” As one of the first to utilize the REAP program in New Mexico, Haley Farms is now a trailblazer in the region. Other farmers use Haley as a resource when pursuing renewable energy projects.

# Farm Energy Success Stories

## FROM THE SOUTHEAST

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**T**he Southeast received more than \$50 million in REAP grants and more than \$31 million in loan guarantees from 2008 to 2013. Farmers in the Southeast led the country in biomass projects by far, with an impressive 86 biomass awards across the region. The region also pursued 340 new solar projects to power farms and businesses. More than 1,280 small energy efficiency grants helped cut input costs for a diverse range of operations, such as poultry houses and aquaculture. In total, 1,775 clean energy projects were funded between 2008 and 2013, leveraging more than \$329 million in private investment. North Carolina and Georgia were lead states with benefits broadly shared among the states.

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### Solar

#### Spencer Pope Farms Carthage, MS

**Grant:** \$20,000

**Technology:** Solar



Spencer Pope was one of the first farmers in Mississippi to use solar technology, and initially he was somewhat skeptical about the investment. He started relatively small, with “sort of a test,” installing enough panels to cover about 20% of his poultry farm’s electricity use. He received a 2009 REAP grant of \$20,000 for his pilot project, reducing costs enough to make the project possible.

Spencer Pope’s initial 8.4 kW photovoltaic system quickly turned him into a believer. He was saving about \$250 per month on his electricity costs, and the panels were surpassing projections on electricity production. Within a

year, he pursued a second solar project, adding an additional 38.7 kW to the system. Now the solar panels generate 100% of the farm’s electricity needs.

He notes that solar is becoming more and more affordable, and if it made economic sense for him in 2009, it makes even more sense for farmers today.

“I would encourage any farmer to look at it if they have access to the REAP grant,” Pope said. “With a 25% cost share, and with the prices coming down so much, it’s become very affordable for farms to do this. I’m very pleased.”



Pope said his main motivation for pursuing renewable energy on his farm was to cut back on utility costs and make a smart economic choice to support his family.

“We’ve got so many family farms struggling, and the main reason is that utility costs are through the roof,” he said.

“Especially with solar, now that prices have come so extremely down in the past two years, we really are at the point where this grant will be the tipping point. I think [renewable energy] really would help my friends and neighbors here. I would encourage [legislators] to fund it, and I would encourage my neighbors to pursue it.”



## University of Georgia

Athens, GA

Grant: \$100,000

Technology:  
Energy Audit

Energy Audit

The University of Georgia at Athens (UGA) College of Agricultural and Environmental Science won a new sort of REAP grant in 2009. A \$100,000 energy audit grant was awarded to a team from the college, led by Associate Professor Dr. John Worley, to provide affordable energy audits to poultry houses across the state. Poultry growers could apply for their own REAP grants using information gained from the audits.

Because there are so many poultry houses in Georgia — around 12,000 — and the equipment in many production houses is becoming outdated, focusing on the poultry industry was an effective target for improving the state’s energy efficiency. Worley said one common upgrade is to replace plastic ventilation curtains on the sides of houses with insulated walls. This single upgrade can cut energy use by as much as 50%.

Since starting the energy audit program, the college has audited over 1,000 poultry houses on 50 farms. Of these, Worley estimates 75-80% make subsequent upgrades. The REAP grant-funded audits identified energy efficiency actions that could save enough energy to power 5,600 homes, and now the university team continues to assist producers in improving their efficiency and lowering energy costs.

“The most satisfying thing is being able to help people operate more efficiently and more economically, cutting down on wasted energy,” Worley said. “If we can put money into helping people be more energy efficient and use less energy, then that’s probably the cheapest way to reduce our dependence on fossil fuels.”

# Biomass Crop Assistance Program

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The Biomass Crop Assistance Program (BCAP) incentivizes production of non-food energy crops and was first created with strong bipartisan support in the 2008 Farm Bill (formally known as the “Food, Conservation, and Energy Act of 2008”). BCAP is designed as a catalyst to encourage farmers to grow new perennial energy crops or introduce new energy crops. BCAP works in partnership with agricultural producers and bioenergy plant owners to overcome barriers to the establishment, production and transportation of energy crops for conversion to bioenergy.

BCAP’s private partners benefit from new income and growth opportunities. The public benefits from an improved and healthier natural environment, along with economic growth, increased private investment and new job creation. BCAP incentives are intended to reduce the costs and share the risks of transitioning to new and expanded sources of biomass energy. BCAP incentives require that recipients have a conservation, forest stewardship or equivalent plan to qualify for payments.

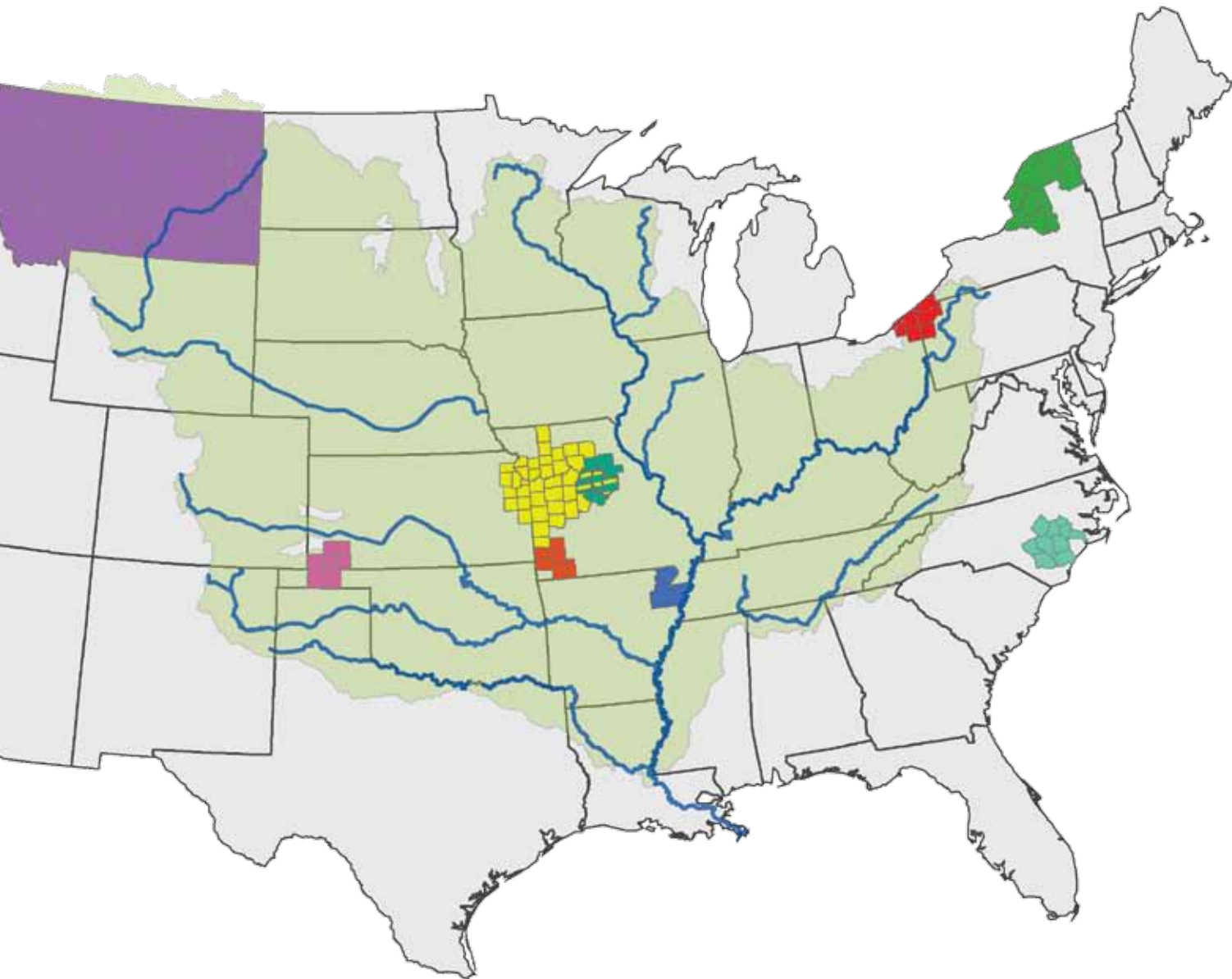
The Biomass Crop Assistance Program provides the first-ever national effort to accelerate commercial use of energy crops. Introducing new crops and practices offers opportunities for agricultural producers to both expand and diversify their incomes. Ultimately, if we succeed in establishing this new energy resource, agriculture will have expanded its share of energy markets, adding new and diversified revenue streams.

Americans across the country value clean water for both ground water and surface waters such as streams, rivers or lakes. Energy crops offer the opportunity to align environmental values with economic gains. When compared to conventional cropping systems, energy crop production can have neutral to positive impacts on ground and surface water quantity and quality.

The USDA has significantly improved BCAP program administration since 2009, with a new focus on establishing project areas — geographic regions where farmers can enroll acres to grow energy crops — centered around biomass conversions facilities. To date, the USDA has made awards for 11 BCAP Project Areas, based on a nationwide competitive process. Within each respective area, a Biomass Conversion Facility (BCF) will purchase the locally grown biomass and convert it to renewable energy. Farmers need a market for new energy crops, and BCFs need a reliable supply of biomass feedstock. The Project Areas facilitate a business relationship for all entities.

Congress has a strong interest in continuing BCAP with mandatory funding because it plays an important role in supporting long-term development of non-food energy crops. BCAP has sparked project ideas from across the country, many of which can take root with continued program support.





## BCAP Project Areas

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| <span style="display: inline-block; width: 15px; height: 10px; background-color: #d9ead3; border: 1px solid #000; margin-right: 5px;"></span> Mississippi River Basin                 | <span style="display: inline-block; width: 15px; height: 10px; background-color: #800000; border: 1px solid #000; margin-right: 5px;"></span> PA 6, Beaver Biodiesel LLC, camelina                    |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #ffff00; border: 1px solid #000; margin-right: 5px;"></span> PA 1, Show Me Energy Coop, switchgrass  | <span style="display: inline-block; width: 15px; height: 10px; background-color: #d9534f; border: 1px solid #000; margin-right: 5px;"></span> PA 7, Abengoa Biofuels, switchgrass                     |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #0056b3; border: 1px solid #000; margin-right: 5px;"></span> PA 2, MFA Biomass, giant miscanthus     | <span style="display: inline-block; width: 15px; height: 10px; background-color: #6aa84f; border: 1px solid #000; margin-right: 5px;"></span> PA 8, AltAir Fuels LLC, camelina                        |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #008080; border: 1px solid #000; margin-right: 5px;"></span> PA 3, MFA Biomass, giant miscanthus     | <span style="display: inline-block; width: 15px; height: 10px; background-color: #9bbb59; border: 1px solid #000; margin-right: 5px;"></span> PA 9, ZeaChem, hybrid poplar trees                      |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #e67e22; border: 1px solid #000; margin-right: 5px;"></span> PA 4, MFA Biomass, giant miscanthus     | <span style="display: inline-block; width: 15px; height: 10px; background-color: #2e8b57; border: 1px solid #000; margin-right: 5px;"></span> PA 10, ReEnergy Holdings LLC, shrub willow              |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #e74c3c; border: 1px solid #000; margin-right: 5px;"></span> PA 5, Aloterra Energy, giant miscanthus | <span style="display: inline-block; width: 15px; height: 10px; background-color: #4db6ac; border: 1px solid #000; margin-right: 5px;"></span> PA 11, Chemtex In'l Inc Project Alpha, giant miscanthus |



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## Environmental Law & Policy Center

The Environmental Law & Policy Center is the Midwest's leading public interest environmental legal advocacy and eco-business innovation organization. We develop and lead successful strategic advocacy campaigns to improve environmental quality and protect our natural resources. We are public interest environmental entrepreneurs who engage in creative business dealmaking with diverse interests to put into practice our belief that environmental progress and economic development can be achieved together. ELPC's multidisciplinary staff of talented and experienced public interest attorneys, environmental business specialists, public policy advocates and communications specialists brings a strong and effective combination of skills to solve environmental problems.

ELPC's vision embraces both smart, persuasive advocacy and sustainable development principles to win the most important environmental cases and create positive solutions to protect the environment. ELPC's teamwork approach uses legal, economic and public policy analysis, and communications advocacy tools to produce successes. ELPC's strategic advocacy and business dealmaking involves proposing solutions when we oppose threats to the Midwest environment. We say "yes" to better solutions; we don't just say "no."

ELPC was founded in 1993 and has achieved a strong track record of successes on national and regional clean energy development and pollution reduction, transportation and land use reform, including high-speed rail development, and natural resources protection issues. ELPC's creative public advocacy effectively links environmental progress and economic development together and improves the quality of life in our Midwestern communities.

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