

## Measuring Sustainability on the Farm

by Dave Legvold, Minnesota corn and soybean farmer

**T**HE OTHER DAY I WAS PLANTING CORN IN MY freshly strip-tilled ground, reveling in the beauty of all the crop residue from last year's soybeans that served to protect and hold the soil. It does not take a whole lot to make a no-till farmer happy—lots of residue from last year's crop will do the trick. I stopped at the end of the field to take a phone call from a college student who was finishing up the last details of a field biology class with a focus on agriculture. She asked, "Do you use sustainable farming practices?"

I responded, "Could you please define what you mean by sustainable?"

Her response was quick and simple, "Sure, it means you don't use chemicals, you plow in lots of cover crops, and you don't raise just corn and soybeans all the time".

I revealed to her that I was a "recovering organic farmer"...I realized that my organic production plan was not sustainable if the topsoil was being washed away.

I revealed to her that I was a "recovering organic farmer." Further explanation pointed out that my early efforts to be an organic corn, wheat, hay and soybean producer did not fit my land very well. The yearly plowing of soil to prepare for planting and seasonal cultivation to keep weeds out promoted serious erosion on my hilly lands. I realized that my organic production plan was not sustainable if the topsoil was being washed

away. Over several years I developed skills in no-till farming, use of low-rate chemical weed control and strict crop rotation. I believed that saving soil and keeping raindrops where they fall was important and attainable through the use of best management practices that fit my farm. Over the years the character of the soil changed to that of something like chocolate cake and the macro-invertebrate population continued to explode. *And...* I was experiencing good return with reduced fuel use and a small machinery inventory.

The student and I agreed that the use of the word sustainable is pretty hard to get a handle on. Rather, I tend to think about practices that yield conservation performance that are observable and measurable. Conservation performance can apply to large-scale agriculture, community supported agriculture,



organic production, animal agriculture, backyard gardens, and many other activities associated with producing the things we need from the land. Conservation performance implies a light footprint on the land and a non-degradational lifestyle as well as assuring that the folks who live downstream from our farms will see clean water that carries less sediment and nutrients.

Some of today's conservation efforts are put in place by government programs that pay a part of the expense that farmers incur to put certain practices on the land. The accepted thought is that these practices will do some good. The missing component is measuring performance.

Preserving a healthy production system carries with it many definitions. Perhaps there are as many definitions as there are people who work the land in their unique way to meet their needs and to assure the future productivity of the land and human systems. Future generations will size up our conservation performance to see if we passed on healthy land and water that will *sustain them*. ☛

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### *Inside this Issue*

- Unlocking the Potential of Anaerobic Digesters** 2
- Stimulating Energy on the Farm** 3
- New Office of Ecosystem Services and Markets** 4
- Webinar on the Biomass Crop Assistance Program** 6

# Unlocking the Potential of Anaerobic Digesters

by Ryan Stockwell, Clean Energy Program Manager

**T**HE RECENT FLOODS ALONG the Red River focused the nation's attention on yet another natural disaster. They also galvanized and united communities up and down the Red as they battled to save their homes and communities from destruction.

While watching from afar through the convenience of live televised coverage, I was truly amazed at the teamwork evident throughout each community as residents and volunteers worked together, filling sandbags, forming "sandbag brigades" to move the bags by hand to existing levees, then placing each sandbag, one by one, to raise walls of protection along the cresting Red. In many ways these heroic efforts seem an apt metaphor for the work and approach needed to address greenhouse gas emissions. Not only will the work of addressing climate change require all members of the community to commit to and pursue a unified goal, it will take coordination, vision, and planning to ensure that the work is completed as effectively and efficiently as possible and that the

work of many is not wasted because of a failure on the part of leaders to raise the levees along an ignored stretch of the river.

This shortsightedness in flood management is akin to fighting to reduce greenhouse gas emissions in certain sectors like automobiles while ignoring the emissions from other sectors like farm waste management. A full 14% of U.S. greenhouse gas emissions come from agriculture, yet most—if not all—attention is focused on large scale electric power generation (32%) and transportation (25%). So even if transportation emissions are cut in half over the next 20 years, the continuation and probable growth in emissions from the agricultural sector will overshadow any gains.

It's from this perspective we must ask, *How will we address agricultural emissions?* While we have multiple policy paths ranging from a strict regulation of greenhouse gases from the agricultural sector to a more lax support for voluntary efforts to curb emissions, the first

and more important issue to resolve is determining how we will curb emissions. Then we can help state legislatures and Congress figure out how to get there.

One solution that deserves more consideration is the widespread implementation of anaerobic digesters.

Digesters act as big cooking pots where manure and other organic waste is heated in a sealed tank. The heat allows bacteria to break down the waste, effectively pulling off the methane in the sealed tank. Then the methane can be burned in an engine to create electricity. The electricity produces very few emissions, is renewable, and has the added benefit of dispatchability—it can be turned on and off when needed, unlike wind or solar.

**Widespread introduction of anaerobic digesters across animal agriculture has the potential to greatly reduce nutrient and pathogen runoff, while also eliminating up to a third of the greenhouse gas emissions credited to agriculture.**

Methane from animal waste poses a considerable source of emissions, and has 20 times the greenhouse gas impact of carbon dioxide. Moreover, animal waste causes a number of other environmental and human health issues. When undigested manure is applied to land it releases ammonia in a gas form. Undigested manure also contains potassium, nitrogen and phosphorous vital to plant growth. Unfortunately it is often difficult for plants to obtain the nutrients from undigested manure,

*Anaerobic Digesters continued on page 7.*



# Stimulating Energy on the Farm

## New & Expanded Incentives for Saving and Producing Energy

by Dan Thiede, Clean Energy Program Coordinator

**W**HEN HEADING TO THE GROCERY STORE to go shopping, it feels better to walk out the door with a pocket full of coupons. Chances are those coupons will lead you to pick up a few items that you would not have otherwise purchased—it can't be helped. But wouldn't those coupons be even better if the investments they led you to make could keep on saving you money or get your local utility to cut you a check each month?

The American Recovery and Reinvestment Act (ARRA) of 2009 contains several provisions that promote and incent energy efficiency and renewable energy. Pair these opportunities with Farm Bill and other programs, and it becomes increasingly clear that *now* is the time to invest in saving and producing energy on the farm.

Some of the opportunities listed below are literally as easy as clipping a coupon, while others are a bit more competitive—but all of them hold promise for creating more profitable farms that protect the environment, which can only be a good thing during the current economic storm.

When considering your options for energy improvements, a good rule of thumb is to begin by becoming as energy efficient as possible—sealing and insulating your house and other facilities on the farm can reduce heating and cooling bills up to 20%. The best way to get started is to call your local utility and set up an energy audit. Then when you install a renewable energy system, you know that you will be using the electricity you produce as efficiently as possible, accelerating the return on your investment.

### American Recovery and Reinvestment Act

**Low-Income Weatherization:** ARRA provides \$5 billion for the DOE Weatherization Program. The Weatherization Assistance Program enables low-income families to permanently reduce their energy bills by making their homes more energy efficient—through energy efficiency measures like insulation, space-heating equipment, energy-efficient windows, water heaters and efficient air conditioners. Get in touch with your state energy office as soon as possible to learn about their specific eligibility guidelines.

**Tax Credits:** Through the ARRA, tax credits that were previously effective for 2009 have been extended to 2010 as well, and the limit has been raised from 10% to 30%. The tax credits that were for a specific dollar amount have been converted to 30% of the cost, while the maximum credit has

been raised from \$500 to \$1500 for the two years (2009–2010). Some improvements such as ground source heat pumps, solar water heaters and solar PV panels are not subject to the \$1,500 maximum. The \$200 cap on windows has also been removed. A helpful list of federal tax credits for energy efficiency can be found at [www.energystar.gov/taxcredits](http://www.energystar.gov/taxcredits).

Four types of upgrades are covered by these tax credits:

- Home shell improvements like insulation, windows and sealing
- Home heating, ventilating and air-conditioning
- Renewable energy technology like ground source heat pumps, solar water and PV systems, and small wind
- Hybrid and diesel cars



ARRA also includes a provision to uncap the federal small wind turbine Investment Tax Credit (ITC) originally passed last October. The removal of the cost caps on the small-wind ITC will provide consumers with a true 30% tax credit for the purchase and installation of small wind turbines with rated capacities of 100 kilowatts (kW) or less for home, farm, or business use. The ITC is available for systems installed between October 3, 2008 and December 31, 2016. The value of the credit is now uncapped through ARRA.

**Renewable Energy:** ARRA also contains a number of other provisions potentially benefitting renewable energy production on the farm:

*Stimulating Energy on the Farm  
continued on page 7.*

## Setting a Clear Course for the Obama Administration's Federal Office of Ecosystem Services and Markets

by Ryan Stockwell, Clean Energy Program Manager

In the days between the November election and Barack Obama's January Inauguration, the Bush Administration established the Office of Ecosystem Services and Markets while wrapping up its 2008 Farm Bill duties. The Farm Bill, after all, did require the USDA to establish guidelines and science-based methods to analyze the environmental services provided by working agricultural lands as a first step toward establishing markets through which farmers may receive compensation for these ecological services.

### What is Conservation Worth?

The development of the Office of Ecosystem Services and Markets is one step in a long line of attempts to address the underlying difficulty that has heretofore been inherent in working lands conservation: placing a price on a product that has no currently existing market or inherent or obvious monetary value. Efforts to this point to establish cost-effective conservation delivery systems not only acknowledged this difficulty, but for the most part have also sought to work within its limitations. If conservation could not be obtained through the clarity of markets—with their ability to reward cost-effective and proven results—then the government would simply require conservation steps of agricultural producers. For years that provided the basis of conservation efforts and allowed for the implementation of key conservation steps such as terracing and windbreaks, with the fairly obvious benefits of reduced water and wind erosion. Yet, because the value of the results could not be easily monetized or

measured through cost-benefit analysis, the public exhibited a high level of frustration with conservation programs. For many people not on the ground observing the conservation measures, the benefits seemed to outweigh the costs. Moreover, without a true valuation of the environmental benefits to be gained through conservation measures, and often determined by site-specific characteristics, many farmers themselves found difficulty justifying participation beyond the minimum required.

More recent conservation methods have sought to mimic market valuations by providing payments for implementing particular cropping methods. The Conservation Reserve Program pays landowners a portion of the average land rental rate in the area for fulfilling long-term land set-aside agreements. The more recently developed Biomass Crop Assistance Program seeks to provide payments to landowners while biomass crops are established, which can take a number of years, and become

able to provide a return on investment. These programs have experienced some success in at least mimicking or mirroring market valuation for conservation measures.

However, they are fairly limited in application to set-aside and biofuel-dedicated crops. Thus, the newly created Office of Ecosystem Services and Markets will seek not only to duplicate these earlier efforts for traditional working lands, but also to implement a working market for the ecosystem benefits.

Early indications from Washington point to the development of a carbon market as the inaugural ecosystem market. In some regards USDA officials will face fewer difficulties with this

**The newly created Office of Ecosystem Services and Markets will seek not only to duplicate earlier efforts for traditional working lands, but also to implement a working market for ecosystem benefits.**



initial carbon market than with other ecosystem markets, which, by the way, are yet to be determined. Potential ecosystem markets include but are not limited to: methane, nitrous oxide, phosphorous, water quality, sediment and wildlife habitat.

### Moving Forward: Three Key Issues

This is easier said than done, and the devil is in the details. As the USDA moves forward with developing the Office of Ecosystem Services and Markets, a number of questions will require clear answers in order for ecosystem markets to become efficient trading venues with clear product ownership, pricing mechanisms, product information and tracking methods—all while reducing government costs and minimizing uncertainty for participants. This is a tall order indeed, and one which will be fulfilled only after USDA clarifies three issues.

*First*, what measurement methods will ecosystem markets require for farm-provided ecosystem services to qualify for markets? The inherent difficulty with ecosystem markets, and a main reason for the long history of difficulty in pushing conservation, is the difficulty with measuring ecosystem impacts from conservation activities. In other words, it is one thing to measure point-source pollution and a reduction in point-source pollution; it is entirely another thing to measure reduction in non-point solution across millions of acres, thousands of water drainage areas, and thousands of miles of streams and rivers. Indices, however, appear the best tool for addressing the measurement issue as they can provide a quick and fairly accurate snapshot for scoring ecosystem services on individual farms. These indices will need continued development and refining as this program moves forward.

*Second*, what requirements, if any, will be placed upon land owners and managers to achieve minimal ecosystem services? Establishing standards for participation is another inherent difficulty with developing ecosystem services markets. Historically, agriculture has not been held to pollution reduction laws. And within the proposed ecosystem services markets, with participation voluntary for farms, what ground rules will be established for voluntary participation? In other words, when farmers sign up to sell various



carbon, water quality or habitat credits, what actions must they do to qualify?

*Third*, who will be the major market players providing ecosystem services, and who will they serve? Since farmers themselves will not be required to participate in pollution reduction programs, who will provide the demand for the voluntarily farm-produced ecosystem services? Entities currently regulated for point-source pollution are likely customers. Water quality trading programs are an example where the group of regulated entities is determined based upon geographic regions, in this particular case a single watershed area. But the market for water quality ecosystem services is fairly unique in that it enjoys clearly defined boundaries and requirements for participation. What about carbon, wildlife habitat, methane and other markets lacking clearly defined boundaries? Determining the scope of participation within each market will play a large role in setting up each market for long-term success or failure.

The creation of the Office of Ecosystem Services and Markets stands as a vital first step to establishing a system that may finally resolve the inherent difficulties of leading individuals to take positive steps towards providing public conservation benefits. The concept of ecosystem services markets also has the potential to resolve many of the difficulties experienced in past conservation programs. Rulemaking and other upcoming decisions will be crucial for designing ecosystem services markets that really work for the nation's landowners, service providers, and our environment. 🍀

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# Webinar: 90-Minute Introduction to the Biomass Crop Assistance Program

Thursday, June 25, 2009 | 1:30-3:00pm CDT

## AGENDA:

- 1:30-1:35** Introduction & Overview – Ryan Stockwell, Clean Energy Program Manager, The Minnesota Project
- 1:35-1:50** Implications for Biomass Crop Growers & Users – Joel Tallaksen, Gasification Project Coordinator, University of Minnesota Morris
- 1:50-2:15** A State's Perspective on BCAP – Gary Radloff, Director of Policy and Strategic Communications, Wisconsin Department of Agriculture, Trade & Consumer Protection
- 2:15-2:30** Federal Policy & Implementation Issues – Kelly S. Novak, Planning and Analysis, USDA Farm Service Agency
- 2:30-3:00** Question & Response Time

**ABOUT BCAP:** The Biomass Crop Assistance Program (BCAP), created as a key provision in the 2008 Farm Bill, looks to promote the cultivation of perennial bioenergy crops that show exceptional promise for producing highly energy-efficient bioenergy crops that preserve natural resources and that are not primarily grown for food or animal feed.

BCAP will provide financial assistance to any biomass conversion facility or group of producers that contribute to the production of renewable biomass to use as an energy source. BCAP aims to relieve the dependency on commodity crops as an energy source and shift to less strained biomass materials.

The program is currently in the process of environmental assessment and rulemaking, and is projected to begin no earlier than spring 2010. However, the main structure of the statute remains intact and many want to see the program begin sooner—including President Obama—even if just in pilot form. This May, Obama formed an Interagency Biofuels Working Group and issued a directive to USDA Secretary Vilsack to accelerate investment in biofuels.



**REGISTER TODAY!**

Visit [www.MNProject.org/BCAP.html](http://www.MNProject.org/BCAP.html) to learn more, register, find a location to view the webinar, or host a local event. Space is limited, so register as soon as possible.



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*Anaerobic Digesters continued from page 2.*

creating widespread potential for runoff into waterways. Animal waste runoff contributes to the Gulf of Mexico “Dead Zone,” an area roughly the size of New Jersey located at the mouth of the Mississippi River that is inhospitable to aquatic life. Excess nutrients contribute to the growth of algal blooms, and when they die oxygen is used to decompose the algae, creating hypoxic conditions. This uses up the oxygen that would otherwise be consumed by aquatic life. Along with these nutrients, undigested manure also contains pathogens that can harm wildlife and humans if released into waterways.

Fortunately, technology exists that not only provides a clean energy source, but resolves or greatly reduces the problems of nutrient release into waterways. Digesting manure allows it to more readily release nutrients to plants, greatly reducing the potential for nutrient runoff into waterways. Digested manure also kills over 99% of all pathogens, almost entirely eliminating the risk of introducing pathogens such as ecoli and cryptosporidium into our water supply.

Widespread introduction of anaerobic digesters across animal agriculture has the potential to greatly reduce nutrient and pathogen runoff, while also eliminating up to a third of the greenhouse gas emissions credited to agriculture. Couple that with the role digesters could play in creating clean, renewable energy and eventually displacing fossil fuel power with its high greenhouse gas emissions, and you get a double impact in reducing greenhouse gases—once in the agricultural sector and again in the electric sector. Addressing greenhouse gases in the agricultural sector is just as necessary to reducing total greenhouse gas emissions as it is to sandbag along the entire length of a flooding river. In fact, the strategy of addressing agricultural greenhouse gas emissions through digesters is like putting down sandbags twice the size of traditional sandbags, making it much easier to achieve our collective goal of containing a flooding river of greenhouse gas emissions. ♣

*Stimulating Energy on the Farm continued from page 3.*

- The option to receive a cash grant through the US Treasury in lieu of the ITC.
- An expansion of the Clean Renewable Energy Bond (CREB) program to finance facilities that generate electricity from a number of renewable resources.
- Expanded research and development funding through DOE’s Energy Efficiency and Renewable Energy program, largely focused on biomass and geothermal.
- Extension of bonus depreciation for businesses, allowing them to recover the costs of capital expenditures by immediately writing off fifty percent of the cost of depreciable property expenditures in 2009 (equipment, tractors, wind turbines, solar panels, etc).
- Five-year carryback of net operating losses for small businesses.

**Rural Energy for America Program**

The Rural Energy for America Program (REAP) is Section 9007 of the 2008 Farm Bill (formerly 9006). There is \$60 million in this program nationwide for 2009, up from roughly \$17-23 million annually in previous years. Applicants can be either rural small businesses or agricultural producers, and projects can be in the areas of energy efficiency, small wind, biomass, solar, or geothermal. There are grant opportunities

(up to 25% of eligible project cost) and guaranteed loan opportunities (up to 50% of project cost). You can apply for a combination of both. Contact your state or local USDA office for REAP details and to apply today.

Visit [Recovery.gov](http://Recovery.gov), [USDA.gov](http://USDA.gov) and [DSIREusa.org](http://DSIREusa.org) to shop for more “coupons” and incentives. ♣



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working for strong local economies,  
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## About this publication:

The *Conservation Planner* is published by The Minnesota Project. Through projects, partnerships and policy, The Minnesota Project facilitates and increases the sustainable production and equitable distribution of food and energy in communities across Minnesota and the Midwest. For more information visit [www.mnproject.org](http://www.mnproject.org).

## Reprinting & Contributions:

Permission to reprint is granted in advance. Please acknowledge this source. We welcome articles from our readers that share stories and experiences related to conservation agriculture. To suggest articles or contribute, contact Ryan Stockwell by e-mail: [rstockwell@mnproject.org](mailto:rstockwell@mnproject.org), or by phone: 651-789-3330.

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## New Blog, "Centered on Sustainability"

Read it now at [www.mnproject.org/blog](http://www.mnproject.org/blog)

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## Apply for 2009 National Organic Initiative

THE ORGANIC INITIATIVE is an important outreach effort for NRCS—nationally, \$50 million has been set aside for organic producers and those transitioning to organic production. Organic producers may also apply for assistance under general EQIP. Under the National Organic Initiative, minimum core conservation practices will be determined by specific resource concerns. Payments may be authorized for these practices including: conservation crop rotation, cover crop, nutrient management, pest management, prescribed grazing and forage harvest management.

Applications received from organic producers or producers in transition to organic farming will be accepted until June 30, 2009. Interested producers should stop by their local NRCS office or USDA Service Center for additional information. Visit [tinyurl.com/EQIPsignup](http://tinyurl.com/EQIPsignup) to learn more and apply today. ☘



## Save the Date! Help Us Celebrate 30 Years

THE MINNESOTA PROJECT is pleased to invite you to join us this fall in celebrating our 30 years of service as a nonprofit organization. It will be a time to look back on the good work that has been done by so many dedicated individuals, and especially a time to look forward to our next 30 years of important projects. To highlight the energy and excitement of the future, the evening will feature a dramatic performance by young actors at SteppingStone Theatre for Youth Development!

Please mark October 24th, 2009 at 6:30 pm in St. Paul, MN on your calendar, and we will be in touch with more information. You can also learn more at [www.mnproject.org](http://www.mnproject.org). ☘

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