



May 2012

## Summary of EFC Interviews with FPPC Project Farmers Under Manure-to-Energy Initiative (M2E) Objective 5: Financial Template<sup>1</sup>

**Background.** The M2E Scope of Work for the Environmental Finance Center (EFC) calls for surveying a set of producers to learn about their funding sources. Telephone interviews were conducted March 2 - May 2, 2012 with 10 Farm Pilot Project Coordination Inc. (FPPC) project farmers in six states.<sup>2</sup> FPPC provided EFC with farmer contact information and briefed EFC about each farmer and farm project prior to the interviews.

Most projects are to produce heat and/or electricity from poultry litter gasification. One project composts poultry litter for organic fertilizer. Two dairy manure projects are for liquid/solid separation and combustion, but not anaerobic digestion.

A set of 15 questions was prepared and vetted to elicit farm and farmer background, technology systems that are in-use or prospective, avenues and options for funding and financing the project, and an additional open-ended question asking for advice for other farmers who are considering innovative technology.

In a year with record high temperatures and very early onset of spring, farm operations were underway during the interview period. This made reaching each of the farmers unusually challenging. Individually they are each an innovator, highly respected, very active in their community, and sought out for committees, forums, conferences, etc. Considering the demands on their time, the farmers were all very responsive and open.

**Summary.** The summary follows in four sections.

### **1. Why invest in a new technology system for manure management, especially poultry litter gasification?**

#### Current Risks

- Poultry operation does not own or rent enough cropland to spread litter
- Restrictions on litter land application - especially in high phosphorus areas
- Limited available farmland in cost effective trucking distance
- Sudden interruption or change in contracts to move litter off-farm
- Compliance with nutrient management plans, now and future

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<sup>1</sup> Dan Kugler, Senior Research Scholar, Environmental Finance Center, University of Maryland, with assistance from Megan Hughes, Program Manager, and Allie Santacreu, Program Assistant.

<sup>2</sup> Three of the farms are located in Pennsylvania; two in each of Virginia and Wisconsin; and one in each of Delaware, Florida and South Carolina.

### Current Situation

- Litter is a resource, owned and controlled by the farmer not by the integrator
- On-farm control of poultry house heating
  - displacement of integrator propane
  - heating requires about one-third of litter
  - there may be bird health benefits (growth rate, mortality) with dryer heat
- Ash co-product as a component of commercial fertilizer
  - gasification ash is about 20% of litter input
  - ash characterization underway
  - agronomic field trials underway
  - fertilizer company is partner in ash form and incorporation in field product
- On-farm production, use and grid sale of electricity
  - gasification of all litter
  - most likely bird house heat will be retained
  - electricity for poultry operation and farm
  - residual electricity to be sold to grid via net metering agreement

### New risks

- Heat option not cost effective
- Electricity option not cost effective
- Heat and electricity option not cost effective
- Management of gasification unit/system too complex or too time consuming
- Laws/regulations affecting incineration and emissions from gasification
- Change in business contracts with integrators
- Contracts/ business arrangements with utilities or cooperatives for electricity

### New benefits

- Improved bird health and productivity
- Potential to broadly expand regional poultry production
- Sale of higher value ash co-product of gasification for formulated fertilizers
- Farm control of heat and electricity
- Sale of electricity to grid

## 2. Why is Farm Pilot Project Coordination (FPPC) involved?

In every case, poultry or dairy operators were considering or in the process of significant technological change for handling/processing animal waste, whether dairy manure or poultry litter. Technological change thrusts the farm into a process of innovation, a process fraught with learning and discovery, expenditure and investment, and risk and reward. It entails acquiring or adapting appropriate vendor equipment for an active farm operation, ensuring that it works efficiently and effectively, tending to short and long term operations and maintenance, and gaining an understanding of the net change in economic performance. The farmers found that the process of integrating the new technology system into their farm operations is much longer,



much more complex, and more expensive than they anticipated. They also found in some cases and for a variety of reasons that the technology would not work and/or would not be profitable.

Innovation almost always also entails development of markets for co-products, whether on-farm or external. The principal co-product market may be relatively obvious, for example heat for poultry houses to displace propane. However, in the same example, the ash co-product is a relative unknown. This is in terms of chemical composition, and also in developing the processing steps needed to put ash in a usable form such as granules or pellets, developing ways to incorporate ash in a commercial fertilizer or to use it directly in the fields, and conducting field trials to confirm its nutrient value in crop production. Similar to adoption of technology to gasify poultry litter, development and commercialization of the ash co-product is also expensive, lengthy, and risky. Yet, revenue from ash may be the profit margin for the innovation, or it may become the principal co-product where heat is a simple input to bird production.

FPPC is a non-profit entity created by Federal law in 2002 to work as an independent, third party partner with farms to demonstrate innovative treatment technologies which reduce nutrient content from the animal waste stream of feeding operations and help achieve watershed improvement goals. FPPC is overseen by NRCS and is a Technical Assistance Service Provider to NFWF. They directly assist farmers with skills and advice for technical and systems problem solving. They can support and cost share choosing, adapting and acquisition of technology. More importantly, FPPC stays with a project farm and vendors until the technology system is fully vetted and operational well beyond a shakedown period. This is unique and a huge asset for farms planning or engaged in innovation.

For the M2E Initiative, FPPC is the ideal lead for the five demonstration projects. Farms link to FPPC in a variety of ways...through an RFA, word-of-mouth, university contacts, NRCS field staff, FPPC outreach, an ongoing grant, state agriculture agencies, and others.

### **3. Funding/Financing**

The five demonstration projects for litter conversion under the NFWF Manure to Energy Initiative and other projects with FPPC partnership are innovations, often one-of-a-kind adaptations of one or more technologies to fit a particular farm. In addition, co-product markets may not be set. These are not off-the-shelf, proven systems which traditional financial and banking communities endorse. The same is true for the dairy projects, i.e. innovative technology system changes were being demonstrated on individual farms.

For the poultry operations, this means that financing a demonstration project is not traditional. Funds and support are raised through Federal and state grant programs, vendor cost sharing, foundations, and, to some extent, farmers personal savings and private capital through local banks and credit organizations. The one exception was an FPPC project which on its own went to full commercial expansion via guaranteed loans from a regional bank and venture capital. FPPC expertise and funds via Federal programs are primary, and attract other funds in a package which supports a whole demonstration project.



It is notable that one of the main sources of information and advice for farmers who were considering an innovation has been the multi-county Resource Conservation and Development (RC&D) offices. These offices across the nation were closed in 2010 when Federal appropriations were not continued. That loss of a resource has elevated the role of NRCS field offices and county Extension agents in guiding farmers to sources of grants and funding. It can also call for elevation of the role of Small Business Development Centers (SBDCs are part of the Federal Small Business Administration) to do the same by being active proponents in agriculture. For one FPPC project in Pennsylvania, the farmer acknowledged that the local SBDC was his most reliable and comprehensive source of information about and contacts for grants and support programs.

The EFC Financial Template for the Manure to Energy Initiative is centric to on-farm poultry litter gasification and outlines active Federal and state programs in agriculture, natural resources, and energy. It also cites banks and credit organizations. The EFC Financial Template will provide some guidance to the five demonstration projects as they innovate and move toward showing technical feasibility and profitability for nutrient management. The Template will be more useful for the next farmers who review the demonstration project results and decide to pursue poultry litter gasification for heat and/or electricity for their farm operation.

#### 4. Advice from FPPC project farmers

Be ready to dedicate time, energy and money beyond what you expect

Be ready to adapt, things will change

Do your own research on-farm

Understand that university research is slow and aimed at publications

Be pragmatic

Get help from a professional grant writer

Projects must cash flow...eventually be profitable

Need markets for all co-products

Know all the angles...tax credits, litter transport programs, renewable energy credits, nutrient credit trading

Get all the help you can

FPPC moves a demo project along faster, more efficiently, and more comprehensively than going it alone

