My name is Eric Zuber, a dairy farmer from western New York. It is an honor and privilege to be with you today to discuss the opportunity the USDA energy programs have given my family's farm in the development and operation of our methane digester. I would like to thank Senator Gillibrand for her efforts to address the milk price crisis that all dairy farmers have endured for the last 18 months. I was present at the hearing that Senator Gillibrand presided over this spring in Batavia, NY. The milk price is slowly rebounding but we have a big hole to dig out of. The value of New York's agricultural products in 2009 was around $4.4 billion, and dairy was the largest single sector: even with the depressed milk price, sales were over $2.3 billion. New York remains the third largest dairy producing state in the U.S.

A quick history of our farm: we really began in 1937. My Dad was 13 years old when his father died. He had nine cows in an old barn that was less than 12 miles from what is now the epicenter of Rochester, New York. Since then we have moved the milking operation twice to a more appropriate location. Today we have over 1750 milking cows, 1500 head of young stock and crop 3000 acres. We employ 26 people and produce 36 million pounds of milk a year and inject six million dollars into the local economy.

We became interested in building a methane digester because of the need for animal bedding. We had been buying sawdust and our sawdust needs have been growing to over $200,000.00 per year. When the heating oil price goes up the sawdust suppliers sell the sawdust for fire logs so sawdust became expensive, scarce or unavailable. In 2007 Mark Moser of RCM International LLC, a methane digester designer, contacted me about the digester project. NYSERDA, the New York State energy agency, had come up with a grant program that made digesters attractive for New York State. Mark Moser's people at RCM started doing some proposals and I ran some proformas on what would make a viable project. It became apparent there was no return on investment without added funding. When USDA announced their REAP, or Rural Energy for America Program (Farm Bill Section 9007), which provides competitive grants of up to 25% of total project cost for renewable energy projects, , we realized that the additional grant funding would make it a viable project. Angela McEliece of RCM did the grant writing and we supplied the information to get the necessary funds of $413,058 secured in 2008.

The NYSERDA grant is mostly production based and we had to secure a bridge loan through Farm Credit to cover the first three years of production. By the time the grants were secured and the approval from Farm Credit came through it was early 2009, and the low milk prices hit home pretty hard. It became questionable to do the project under these financial circumstances. After months of consultation, and with our long term commitment to our dairy business, in early spring of 2009 we decided to go ahead with the project. There were contractors looking for work and we thought there might be some low cost opportunities for construction in this environment. Thomas Hauryski and Titus Falkenburg from USDA Rural Development came out and we signed the paperwork. Titus Falkenburg, RD's State Engineer, was our point person that we consulted with and sent monthly reports and expense statements to. We broke ground in April of 2009. The reimbursement for 25% of the project went extremely well. After the monthly expenses were submitted we would get reimbursed in 2-3 weeks. When we started pouring concrete Titus would make visual inspections in a timely manner. As for the rest of the project itself we felt it crucial to keep the project on schedule. Our goal was to start generating methane before the weather got extremely cold. It would be necessary to heat the 1.5 million gallons of manure to 100 degrees Fahrenheit and we felt if we could not get it going by winter the project would be waylaid till spring.

The most challenging part of the project by far, was obtaining approval for an interconnect agreement from the utility company, National Grid. There was a conflict with the interpretation of the New York net metering law between National Grid, the electric utility, and RCM International LLC and its

subcontractor Martin Machinery, the company that supplied the electric generator. New York net metering law until very recently capped generating capacity for on-farm digesters at 500 kilowatts; that cap was recently raised to 1,000 kilowatts, or 1 megawatt. Martin Machinery originally was supplying a gas engine only capable of 450 kW but putting a bigger generator on with heavier windings, which would add longevity and stability to the generator. This generator was theoretically capable of 570 kW even though it did not have the horsepower to do so. NYSEG, another utility in New York State, was allowing this generator to be used in this configuration, but National Grid insisted that we downsize the generator which we eventually did to a 380 kW generator because that was the next available size. With this being done, numerous upgrades needed to be done to the lines so we could interconnect. I suspect the cost was in the $500,000 range. As long as we were within the net metering law then the utility company would have to foot the bill. The upgrades were eventually done and we began producing power on 12/27/2009. At the same time we began separating solids for bedding from the digested manure with a fan screw separator. We soon learned we would need a second separator so it was added shortly thereafter.

Now that the digester is operating at steady state, we have applied for funding from another 2008 Farm Bill Title IX program, Section 9005, payments for producers of advanced biofuels. Any payments we receive from this program will help us pay the capital and operating costs of the digester and generator.

Looking back at the project and where we are now I would like to make the following summations.

- There seems to be a fair amount of gas in the manure, enough to generate two times the amount of power we use at the farm.

- One of the biggest obstacles was scrubbing the gas. The process makes hydrogen sulfide and that needs to be taken out of the gas to extend the life of the engine and reduce operating costs. The technology for doing this seems to be in the infancy stage and needs to be further developed.

- There is a definite odor reduction in the liquid we are spreading out of the digester. We spread ¾ of a million gallons of it on ground behind a campground and the phone never rang.

- We are getting enough heat off the engine to heat all the water for the milk house and heat two houses for the winter.

- Lastly, we still seem to have issues with National Grid. At certain times when we get over 320 kW of power being produced and the demand is low on the line; it appears that we are driving the voltage too high on the grid, although we are well below 500 kW. The line upgrades apparently are not yet sufficient. I see the real problem is that the grid was never designed to take power backwards. The systems in rural America are basically old. There needs to be infrastructure investment if this type of technology is going to become commonplace. I think in the long run if it is possible to purify this gas it would be more efficient to put it in a gas pipeline rather than to generate power at the farm. There needs to be some studies done to determine where the biogas is and the most efficient way to get the energy back to the end user. If on-farm electric generation is going to be successful you will have to find a way to get incentives to the utility companies to make the improvements and accept this power. In all we continue to

learn about anaerobic digesters. We are doing the things we set out to do and the deciding factor of how successful we will be is our operating and maintenance costs as we go forward.

Thank you,

Eric Zuber