Whole-farm energy management pilot project

Real-time energy consumption tracking has proven successful in industrial and commercial sectors, but it has not been used in agricultural settings. There are several reasons for this, including:

- Most engineering firms do not focus on agricultural customers and do not understand agricultural operations.
- Most agricultural operators are unwilling to take actions that could potentially impact their production unless there is a known benefit.
- Agricultural sites do not often have the advanced metering infrastructure (AMI) required to implement the platform.

This represents an untapped potential for meeting Minnesota's 1.5% energy saving goal. The goal of a recently funded CARD project, awarded to GDS Associates, is to implement an energy tracking software platform in agricultural sites and assess its performance and energy savings. This project will also demonstrate the indirect value of AMI at agricultural sites, which may help utility managers justify speeding up the deployment of AMI in the sector.

GDS plans to work with utility representatives across Minnesota to identify potential farms, targeting 21 test farms in total (seven of each in the dairy, hog, and poultry industries). The sites must be large enough for the energy tracking platform to be beneficial. This is likely to be dairy farms with greater than 200 milking cows, and hog and poultry farms with more than two housing barns. A further criterion is sites with installed electric utility meters that provide one-hour demand data.

Sites which participate in the pilot will receive an energy audit and a two-year subscription to the energy monitoring dashboard Power TakeOff Energy Management System. Sites will receive energy audits to collect equipment data as necessary to help develop an energy model for each site. During the two-year subscription period, GDS will utilize the energy management platform and compare the actual real-time consumption to expected consumption based on repetitive tasks associated with production agriculture (i.e., daily milking schedule, weekly flock development schedule) and will develop an equipment-based energy model for each site.

GDS anticipates the platform will help identify several low-cost/now-cost opportunities for energy efficiency. These include but are not limited to:

- Timers/photocells for lighting
- Thermostats/timers for fans
- Thermostats for livestock waters
- Fan cleaning/greasing
- Refrigeration system maintenance
- Engine block heater timers

The outcome of the project will be a report that will help producers determine if the benefits of whole-farm energy monitoring is a cost-effective option for their business. The report will also detail the value of a whole-farm energy management tracking platform for potential use in utility programs within CIP. The project is due to be completed in August 2018. For more information, contact project manager Laura Silver or CARD program administrator Mary Sue Lobenstein.