MiEnergy
Michigan Agency for Energy
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Farm Energy Efficiency Case Study
Zone 5 Perennials

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Background

Zone 5 Perennials is a small business located in West Olive, Michigan that produces perennials, flowering shrubs, evergreens, and ornamental trees for sale on site as well as at the Holland Farmers Market. The owner has sold products at the Holland Farmers Market for over 25 years and has been selling at the West Olive location for 13 years. However, the owner recently began selling her products only to clients rather than traveling to farmers markets.

In the fall of 2015, the owner wanted to learn more about solar energy and began taking online classes on the subject. She decided to pursue this further and apply what she learned to her farm. After hearing about funding options from another local farm, the owner decided to apply for grants to assist in funding for her energy conservation measure (ECM) project.

Aerial view of the Zone 5 property and greenhouse.

System Implementation

Zone 5's property consists of a 50' long by 30' wide and roughly 12' tall green house with a small shop and store attached. The ECM project involved the implementation of three 160-watt solar panels on top of a pergola on the south end of the greenhouse. The total installation process took about one year. The owner decided to design and build the pergola that the solar panels currently sit on herself.

Pergola with three solar panels located at the end of the greenhouse.

Originally, the owner's idea was to power fans with the solar panels, but the fans were very expensive. After consulting others, she decided to install a grid tide. The grid tide is able to run the fans, as well as pumps and lights. The three 160-watt panels charge a large battery bank and each solar panel is able to run independently, so if one panel does not get enough sunlight, the others are still capable of working.

The owner explains that the whole process has had multiple challenges that have resulted in numerous learnings. "Every step had its own challenges," she explained.

System Impacts

Since installation in April of 2107, the system has been working as expected. However, in the summer of 2018, the owner experienced a decrease in production. She plans to check into the reason for this decline and periodically monitor the system moving forward.

The energy generated by the solar system depends on the month. In the summer of 2017, the owner said the panels were at ideal production levels, which peaked at 65-100 kWh. On average, the solar panels generate about 37 kWh. During the winter months the production is much less due to snow cover on the solar panels and the decreased sunlight levels compared to summer. The only maintenance that the solar panels require is snow removal in the winter.

The owner says that even though the panels do not generate an energy excess in the winter months, the ratio of usage to production stays roughly the same because she does not use the greenhouse and shop as much during the colder months.

Conclusions

Overall, the owner is very happy with the outcomes of the energy conservation measures implemented. When asked if she had any advice for other growers considering pursuing solar energy options, the owner stated, “Just decide to do it and do it, if you can do things yourself and get ahead, do it. I’m thrilled, I’ve learned a lot.” She really pushes for implementing as many solar measures as possible as she has added other energy saving measures since the project. “It has become a passion,” she said, “I think that if you are on the fence about energy savings, you should go for it because this kind of stuff has almost become part of my life.”