

Project Profile

**Zero Net
Energy District**



Photo courtesy of Anna Maria Historic Green Village

Overview

Site Details

- Number of Buildings:** 5
- Total Building Size:** 8,000 SF
- Location:** Anna Maria Island, Florida
- Construction Type:** Renovation and New Construction
- Construction Year:** 1911/1915, 2012
- Building Type:** Multi-use District
- Climate Zone:** 2A

Measured Energy Stats

28	-	35	=	-7
DISTRICT'S TOTAL EUI		RENEWABLE PRODUCTION EUI		DISTRICT'S NET EUI

Site Energy Use Index (EUI) kBtu/SF/year

The Energy Equation: **the district energy use minus the renewables production equals the net energy of the district.**
The district may be 'Getting to Zero' and have a net EUI above zero. If renewable production exceeds energy use its net EUI is below zero (negative) and it is creating surplus energy.

ANNA MARIA HISTORIC GREEN VILLAGE

The Anna Maria Historic Green Village is an unusual combination of historic restoration and modern technology. Owners Mike and Lizzie Thrasher have worked diligently to preserve four 100-year old buildings and merge history with state-of-the-art green technology, all while bringing jobs and economic development to local residents. The Village is currently home to a number of mixed-use buildings including a café, art gallery, boutique and local outdoor equipment outfitter. More businesses are planned, and the aim is to add renewable energy sources so even as the Village grows it will continue to achieve its target of zero net energy.

The owners of the Historic Green Village went to great lengths to preserve the old Florida style structures, including moving entire buildings. This saves the embodied energy inherent in the buildings as well as the charm of Main Street. The buildings at the Historic Green Village also take advantage of free resources available on the beautiful Florida barrier island, sharing critical infrastructure elements such as ground-source heating, photovoltaic solar panels and monitoring equipment.

Planning & Design Approach

Mike and Lizzie Thrasher are dedicated to both saving historic buildings and advancing green technologies. By demonstrating these technologies, they aim to prove their viability and serve as an inspiration for all those who follow. The net zero aspects of the project are guided by three key technological components: (1) insulation, (2) geothermal and (3) renewable energy.

Project Team

Owners: Mike and Lizzie Thrasher

Energy Expert: Tom Stockebrand

Chief Engineer: Ray Kaiser

Awards:

LEED® Platinum

For more information:

Anna Maria Historic Green Village:
www.historicgreenvillage.com/

New Buildings Institute

New Buildings Institute (NBI) is a nonprofit organization working collaboratively with commercial building professionals and the energy industry to improve the energy performance of commercial buildings.

Energy Efficiency Strategies and Features

High Performance Envelope - Insulation is one of the key aspects of Anna Maria Historic Green Village. Every structure is insulated above code levels and has high performance windows. One small building (1,000 SF) is so super-insulated that its total monthly electric bill never exceeds \$20.

Geothermal Technology - Air conditioning and heating are provided via a heat pump system. Water is pumped 450 feet below the café into an aquifer where the water is consistently 72 degrees. In summer, a heat exchanger collects heat from nine air conditioning units throughout the district and rejects it into the ground. The moderate temperature of the groundwater is more efficient than transferring heat into humid air.

Solar Thermal - Domestic water is heated via a flat panel with copper tubing painted black to heat the water to 170 using only solar energy.

Photovoltaics - The Historic Green Village includes 17 solar inverters on arrays totaling over 90 kW for an annual savings of \$11,200/year. Approximately 30 kW of solar panels are installed over the two carports. Other solar panels are installed on the structures, and more will be added over time. The intent is that new panels will maintain ZNE status even as new businesses are added to the Historic Green Village

Monitoring and Verification - The Historic Green Village utilizes eMonitors that track multiple circuits and main feeds. The data revealed that the dominant loads are air conditioning and café loads (specifically freezers, refrigerators and the espresso machine). Reviewing the data made it readily apparent that air conditioners were not phasing in as planned. This was in part caused by excess heat created by a display case in the café. Once a blanket was added, air conditioning loads were immediately reduced by 25%.

Rainwater Harvesting - Two 3,000-gallon cisterns are located under the carport. One is used to water landscaping, and the other is reserve for fire protection. Rainwater collected from rooftops is stored in a separate cistern and used to flush toilets.

Lessons Learned

- The Anna Maria Historic Green Village is an inspiration that demonstrates how superior levels of sustainability are possible in historic buildings.
- Zero net energy is possible today. Measures such as high performance insulation in the envelope and sharing infrastructure within the Village makes it more cost-effective for diverse business owners to tap into energy savings.
- Long-term sustainability is one way to preserve economic development and create jobs in this small community.