Feasibility of Solar Energy in Golf Course Operations

Andrew J. Jorgensen, CGCS
On Top of the World Communities, Inc.
Ocala, Florida

Benefits of Solar

- Lock in energy prices, avoid price increases
- Secure investment
- Increased property value
- Federal tax credit
- Positive public relations
- Sustainability
- Cold weather climates

Backstory & History

- Started with a 22.4kw system on a model home in 2008.
- Net-zero install
- No power bill - ever
- Internet monitoring

Summer of 2011

- 297, 190-watt panels
- 9 inverters
- 56.43kw of energy
- Designed to be 115% of our needs
- Actual 118%
- Ran out of space

Backstory & History

- System has no batteries/storage – if grid goes down, so do we
  - Batteries are very expensive
  - Batteries require on-going maintenance
  - Batteries have shelf life
  - Batteries require a lot of space
  - New technology may make this feasible in the future

Backstory & History

- Return on investment originally calculated at 13.3 years, reality was about 12 years
  - System produced slightly more than expected
  - Energy costs have increased beyond projections
- No power bill since September 2011
  - Received about $12,600 in payments
- About 5 years remaining on ROI

Backstory & History

- 96.8kw system installed 2015 on recreation center - Ocala
- 99.6kw system installed 2016 on recreation center – Clearwater
- 99.4kw system installed 2019 on a new recreation center ($1.43/watt!)
- New neighborhood under construction with solar standard on all homes

Backstory & History

- Temporary setup with storage
- Used for 7 months while power was disconnected
- Operated bathroom lights, fans and irrigation satellite

Why golf course maintenance facilities?

- Hidden from sight
- Usually have large roofs with minimal obstructions
  - Compared to clubhouse with vents, exhaust fans, etc.
- Higher energy use compared to cart storage facility or clubhouse
  - Carts using “smart chargers”
  - Clubhouse energy demand is typically in natural gas
  - “Motel 6” mentality in clubhouses
  - Clubhouse usage is flat or declining due to energy wise appliances, LED lights

Why golf course maintenance facilities?

- Pump stations use too much energy, have higher demand
  - No roof large enough to meet initial or ongoing demand
  - Ground mount would require too much area
  - Usually visible from the golf course
    - Golf ball damage
    - Screening to hide building
- Off-site energy production?

Why golf course maintenance facilities?

- Maintenance industry is changing – more to plug in
  - Additional computers
  - Electric utility vehicles
  - Electric mowers
  - Electric rollers
  - Electric blowers / weedeaters
  - Air conditioning
  - Washwater recycling systems
- We are no longer a barn!

How do you get there?

- Before anything else: have an energy audit performed on your (entire) facility
  - Solar or not – you will see savings
  - Typically free from energy provider
  - Review billing schedules (demand vs. non-demand)
- First in 2007 – reduced expenses about $200/month
  - Recommended timers, photocells, occupancy sensors, remove two drink machines, promote culture of conservation
- Second in 2010 for solar rebate
  - Concluded we were doing everything correct, no room for conservation

How do you get there?

- Site selection – considerations
  - Aesthetics – does your HOA allow this? Neighbors? City/county?
  - Insurance requirements – is it insurable? What is on-going cost?
  - Energy provider requirements – will they force you to update to current code?
  - Feasibility
    - Energy provider will score you for eligibility for install
    - We were 97.88% ideal – almost perfect
    - Future growth of adjacent trees
    - Age of building and roof

Funding

- Work with installer to find rebates, may be multiple
  - We received a rebate for about 1/3 of the total cost
  - PACE Residential Funding in certain states
    - Low-interest, fixed rate loan
    - May be similar program in your area
- Federal corporate tax credit on energy efficient installs
  - Possibly going away
- Our initial cost was about $6/watt, tax credit and rebate brought it to $2.67/watt.
  - Much easier to ask for approval at this point

Installation

- Obtain multiple quotes
  - Make sure they are bidding apples to apples
  - Efficiency (warranty) rating of panels – 15, 20, 30 years
- Ask questions!
  - Age of business and references
  - Warranty – on equipment and install
  - Attachment method
  - Timeline for installation
  - Safety procedures / Insurance
  - Third party – Certified electricians

Installation

- Be involved with every step!
  - You will be THE person for this project for everyone that comes to your shop
  - You will be asked many questions by everyone that sees the system
  - You could even be asked by the USGA to write a Case Study or by GCSAA to do a webinar and speak at GIS
  - Take a lot of photos – every angle, aerial, ground, close-ups, etc….

Maintenance

- Very little needs to be done
  - Wash with hose-end cleaners and a lift annually
  - More often in arid climates
  - Spare fuses ($8 from Amazon)

Talk about it!

- Press releases
- Magazine articles
- Host an open house for your community
- Share information
- Provide updates in the future

good start

The future is now at On Top of the World. Earlier this year, solar panels were installed to provide power at the community's golf maintenance facility.

GOOD TO KNOW:

Here Comes The Sun

In its ongoing mission to conserve energy, On Top of the World has taken another major step toward energy independence. Over the summer, **300 three-by-five foot solar panels** were installed on the roofs of the community's golf course maintenance facility. The $340,000 system, which actually cost $180,000 after rebates and a federal tax credit, will provide 115 percent of the building's power.

"This was a way for us to show that solar is definitely the wave of the future," says OTOW Gold Course Superintendent Andy Jorgensen. "We're getting off the grid and not relying on foreign imports for energy."

"The bottom line is that it uses *no* electricity from the grid," explains Dave Shira, a consultant with ECS Solar and the first resident in OTOW to have solar panels on his home. "They're producing more power than they need to run all three of our golf courses."

The conversion to solar is expected to save OTOW thousands of dollars annually in energy costs. According to OTOW President Kenneth Colen, there's another unforeseen benefit: "They're turning off lights sooner, shutting off equipment at night, and looking for more ways to conserve energy."

20 OCALA'S GOOD LIFE *retirement redefined*

The Castaway Kid

If you have a computer, printer, copier, fax machine, or just about any other kind of electronic device you're not using anymore, get in touch with Ocala-based **Castaway Computers**. Founder Preston Culbertson, a 16-year-old student at Vanguard High School, works with a number of ministries and other charities, including the new veterans home that recently opened in the former Ritz Hotel on Silver Springs Boulevard. Any donated items that can't be used as equipment or salvaged for spare parts will be properly recycled. To arrange to contribute your unused items, visit castawaycomputers.com or call (352) 873-0861.

Key Points to Consider

- Perform an energy audit – first and foremost
- Check your pricing schedule – demand vs. non-demand
- Consider it an investment
  - 160% return on initial investment over 30 years,
  - 270% in 50 years
  - Not including future energy increases
- When everyone else still has a power bill, you won't!
- Excess power sold is dividends received each year

Andrew J. Jorgensen, CGCS
On Top of the World Communities, Inc.
Ocala, Florida

Andy_Jorgensen@otowfl.com
www.ontopoftheworld.com/sustainable-practices
@LowBudgetSupt