

2013 Annual Building Inspection Engineering Conference February 16, 2013



<u>Agenda</u>





Introduction

Ron Merville, Jr. P.E.: Licensed Engineer

- Energy Source Partners, President & CEO
 - Founded in 2007, Incorporated in 2009
 - Owns and operates over 1 mW of solar capacity
- Owner of Nashville-based engineering firm that focuses on civil infrastructure and telecommunications projects for over 35 years
- Consulting Public Works Engineer for Metropolitan Nashville from 1984-1992
- Designed and deployed over 250 telecommunications towers across Tennessee
- Bachelor's and Master's Degrees in Engineering from Vanderbilt University





Energy Source Partners provides the necessary tools for the implementation of innovative, sustainable renewable energy solutions for municipalities, health care facilities and commercial, industrial and residential properties.

Based in Nashville, Tennessee, Energy Source Partners has designed and installed renewable energy systems across the state and owns and operates over 1 megawatt of solar energy capacity.



Projects



Music City Center, 211 kW



The Factory at Franklin, 200 kW



<u>Projects</u>





City of Franklin Wastewater Treatment Plant, 198.7 kW Hospital Corporation of America, 136.42 kW

- Goodwill Industries, 59.8 kW
- Freeman Webb Company, 56.16 kW, 48.96 kW, 102.96 kW



Residential Projects









22.1 kW







Solar Design:

System Specifications

Inputs:

- Latitude/Longitude
- DC Rating (size)
- DC to AC Derate Factor
- Array Tilt
- Array Azimuth
- Shading Requirements

- Array Type
 - Fixed Tilt
 - 1 or 2-Axis Tracking
- Type of racking
- Roof, ground or polemounted



<u>Solar Design:</u>

System Specifications





Battery-Backed System



Solar Design:

System Specifications

Non-Penetrated System

- Racked continuously, ballasts
- Ground –mounted, flat roof, or pole-mounted

Penetrated System

- Bolted to rafters
- Sloped roof



Ground-Mounted



Pole-Mounted







Solar Design: Production





System Tie-In

Grid-Tied System

- Green Meter
- Net Metering
- Net Billing
- Premiums vary



Load-Tied System

- kWh Reduction
- Demand Reduction

*Utility bills required to calculate annual savings





Plan View: Estimating System Size & Weight

Racked with no spacing: 10 watts per 1 square foot of space

Racked with spacing: 5 watts per 1 square foot of space

Example no spacing: 1,000 square feet of roof=> 10,000 watts = 10 kW

Each panel weighs 42-45 pounds, approximately 50-55 pounds with associated hardware System can sustain winds up to 125 mph (F2 tornado)



Potential Problems

Panels

- Physical Damage
- Roof Penetration

Connectivity Issues

- Ground Faults
- Pinched Wires

Inverters: Central vs. Micro

- Monitoring
- Internet Outage

















Discussion/Questions

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