

Buying Solar Photovoltaic Systems



STEP 1: Qualify the Property

- **Verify Site Conditions Are Ideal For Solar**
- **Examine Your Annual Electric Bills**
- **Evaluate Obstructions (Shading Potential)**
- **Determine Roof Type and Condition**



Site Conditions

- **Ownership Status**
- **Roof Top or Ground Mount?**
- **Roof Orientation**
- **Look for Southern-Most Exposure**
- **Tilt / Angle**
- **Estimate Available Space For Solar Panels**
- **Perform a Shade Analysis**



Electric Bills

- **What is Your Annual kWh Consumption?**
- **What is the Average kWh Rate from the Utility?**
- **Notice Seasonal Patterns**



Shading Analysis

- **Visually Look for Obstructions**
- **Use a Shading Analysis Tool (Pathfinder or SunEye)**
- **The Tools Will Analyze Shading All Year**
- **Many Utility Incentive Programs Require This**
- **You Want No Shade During the Solar Window (9 – 3, and June & December)**
- **Analysis Covers the Year, Longest & Shortest Days**



Property Type

- **Commercial, Residential, or Non-Profit?**
- **Owned or Leased?**
- **Zoning, HOA's, Deed Restrictions**



Roof Type & Condition

- Flat or Sloped?
- Membrane? Tile? Shingle?
- Life Span Left on the Roof
- Is Roof Warranty Still Valid?
- Will Roof Need Replaced Soon?



Step 2: Analyze Solar Potential

- **Determine How Many Panels Will Fit in Space**
- **Reference Panel Count Versus Electrical Needs**
- **System Size is Determined By Space & Need**
- **In Many Cases You Will Not Zero Out The Power Bill**



Electrical Requirements

- **Does Panel Count Exceed Annual Electric Bill?**
- **Many Utilities Do Not Purchase Extra Power**
- **Net Metering is Available**
- **Remember That ANY Off-Set is Saving Money!**



Verify System Sized Properly

- **Is System Sized to “Sweet Spot”?**
- **Generally Do NOT Over-Produce Annually**
- **Any Off-Set is a Great Off-Set!!**
- **Cost and Off-Set are Proportionate**



Step 3: Pricing

- **Type of Installation**
- **Main Components**
- **Balance of System**
- **Electrical Runs**
- **Price Adders**



Installation Types

- **Roof Top Residential**
- **Roof Top Commercial**
- **Ground Mounted**
- **Carports, Shade Ports**
- **Rigid Panels or Thin-Film Application**



Main Components

- **Modules**
- **Inverters – Central or Micro?**
- **Racking – Ground, Roof, Standing Seam Metal**
- **Structures Such as Carports**



Balance of System

- **Site-Specific Materials**
- **Be Aware of Wire Run Lengths, Electrical Service, Interconnection Point**
- **Wire**
- **Conduit**
- **Disconnects**
- **Junction Boxes**



Price Adders

- **Permit Fees, Interconnection, Taxes**
- **Roof Type (Shingle, Tile, Metal)**
- **Central Versus Micro Inverters**
- **Distance to Injection Point**
- **Height of Buildings**
- **Site Preparation**
- **Special Equipment Needed**
- **Local Wind Load, Seismic Load, Snow**



Step 4: Payback Analysis

- **Cost of Utility Power**
- **Module Degradation**
- **Derate Factor**
- **Incentives – Local and Federal**



Utility Power Cost

- Calculate Average Cost Per kWh
- Utility Power Escalates Each Year
- Escalation Averages From 3% to 7% Annually
- Remember the Solar Energy Savings is Directly Based on the Consumer Cost of Electricity From the Power Company
- Solar Systems Appreciate in Value Anytime the Utility Has a Rate Increase



Panel Degradation

- **Minimal Amount – 0.5 to .07% Annually**
- **Check the Specs From the Manufacturer**
- **Quality Panels Have a Solid 25 Year or More Warranty – Output Guarantee**



Derate Factor

- **Derate is the Power Loss When Converting DC into AC Power**
- **Derate Currently Averages 15 to 18%**
- **PV Watts Has a Tool To Calculate Proper Derate Based on Equipment Specified**
- **If You Are Not Sure, Use .82 up to .845**
- **DO NOT Lessen the Derate Factor Or Your kWh Production Estimates Will Be Too High**



Incentives – Local and Federal

- **Net Metering**
- **30% Federal Tax Credit**
- **Accelerated Depreciation (5 Years)**
- **State and Utility Rebates**
- **Feed-In-Tariff Programs**
- **SREC's & Carbon Credits**



The Specifics

- **Full Payback in Number of Years**
- **Financing With Immediate Cashflow**
- **Monthly Electric Savings**
- **IRR for Commercial Business**
- **Consider Energy Savings Over System Lifetime**



Step 5: Requesting A Proposal

- **Total Cost**
- **Design Concept**
- **Payback Analysis**
- **Environmental Attributes**
- **Major Equipment List**
- **Construction Schedule**
- **Financing Options**

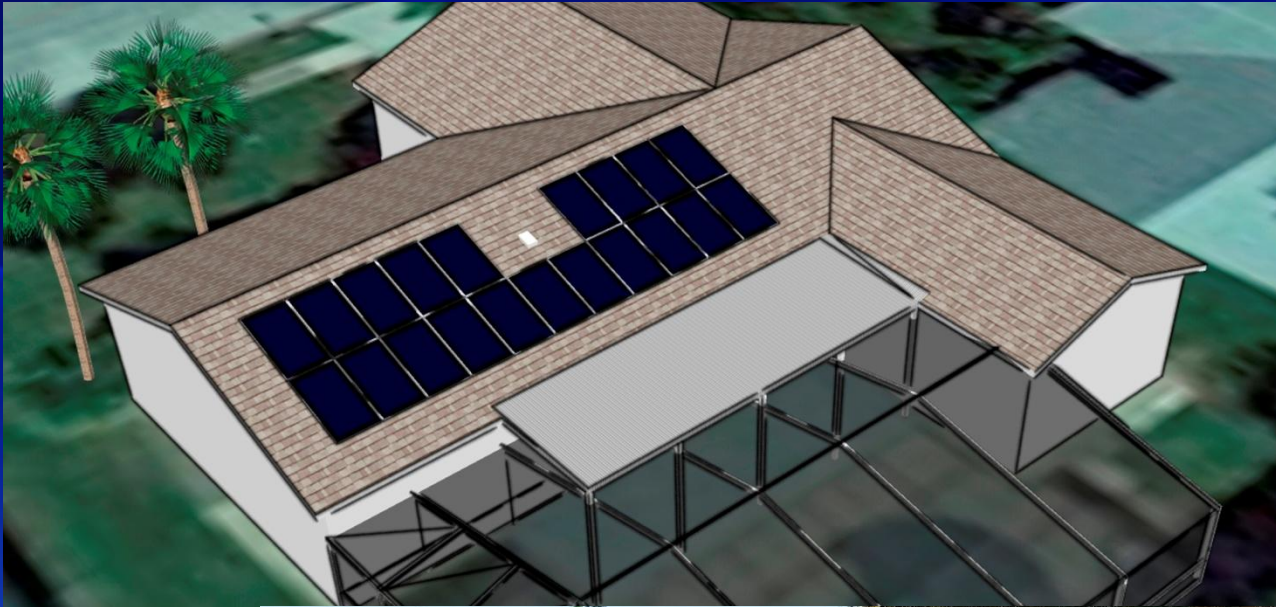


Total Cost

- Total Volume Price and Price Per Watt
- Deduct Incentives (Federal, State, Local)
- See Net Expense After Incentives
- Levelized Cost of Energy



Design Concept



The Solar Experts

Payback Analysis

- **Monthly and Annual Savings**
- **See Full Payback in Years**
- **Financing Costs When Applicable**
- **Maintenance Costs**
- **Commercial –IRR (Internal Rate of Return**
- **Consider The Cost of Doing Nothing**



Environmental Attributes

- “Clean Energy” From the Sun
- CO2 Emissions Reduction
- Examples Like Trees Saved, Cars Off the Road, and Barrels of Oil Saved
- Social Benefits



Equipment List

- **Panels, Inverter, Racking**
- **Some Items Can Be Left “Or Equivalent”**
- **Data Monitoring Included or Not**
- **Get Manufacturer Spec Sheets**
- **Exclusions Clearly Listed**



Construction Schedule

- Time for Engineering
- Time for Permitting Process
- Time for Mounting Hardware
- Time for Panel Installation
- Time for Inverter / Electrical
- Time for Testing & Training
- Time for Inspections & Interconnection
- Unforeseeable Delays Like Weather, Inspection Delays...



Financing & Payment Terms

- **Financial Options Vary By Market**
- **You Can Get a Payment Equal or Lower Than The Electric Bill You Are Off-Setting**
- **You Are Already Making That Payment To The Utility!**
- **Solar Source 15-Year Financing On a 10kW System is \$185/month, saving \$200/month Immediately**
- **Solar Electric PAYS YOU!**



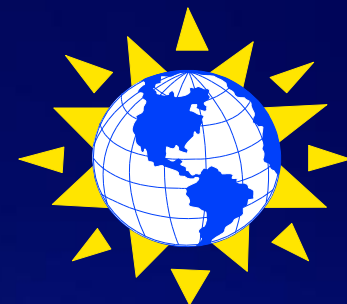
Final Thoughts

- **Solar Electric Works!**
- **No Other Investment For Your Property Quite Like It!**
- **The Technology Is Solid, The Future of Energy Production and Consumption is Here NOW!**
- **Remember Solar Doesn't Cost – It Pays!!**



Solar Energy
Its Future is Now!

Thank you...



solarsourceinstitute
training for our future

