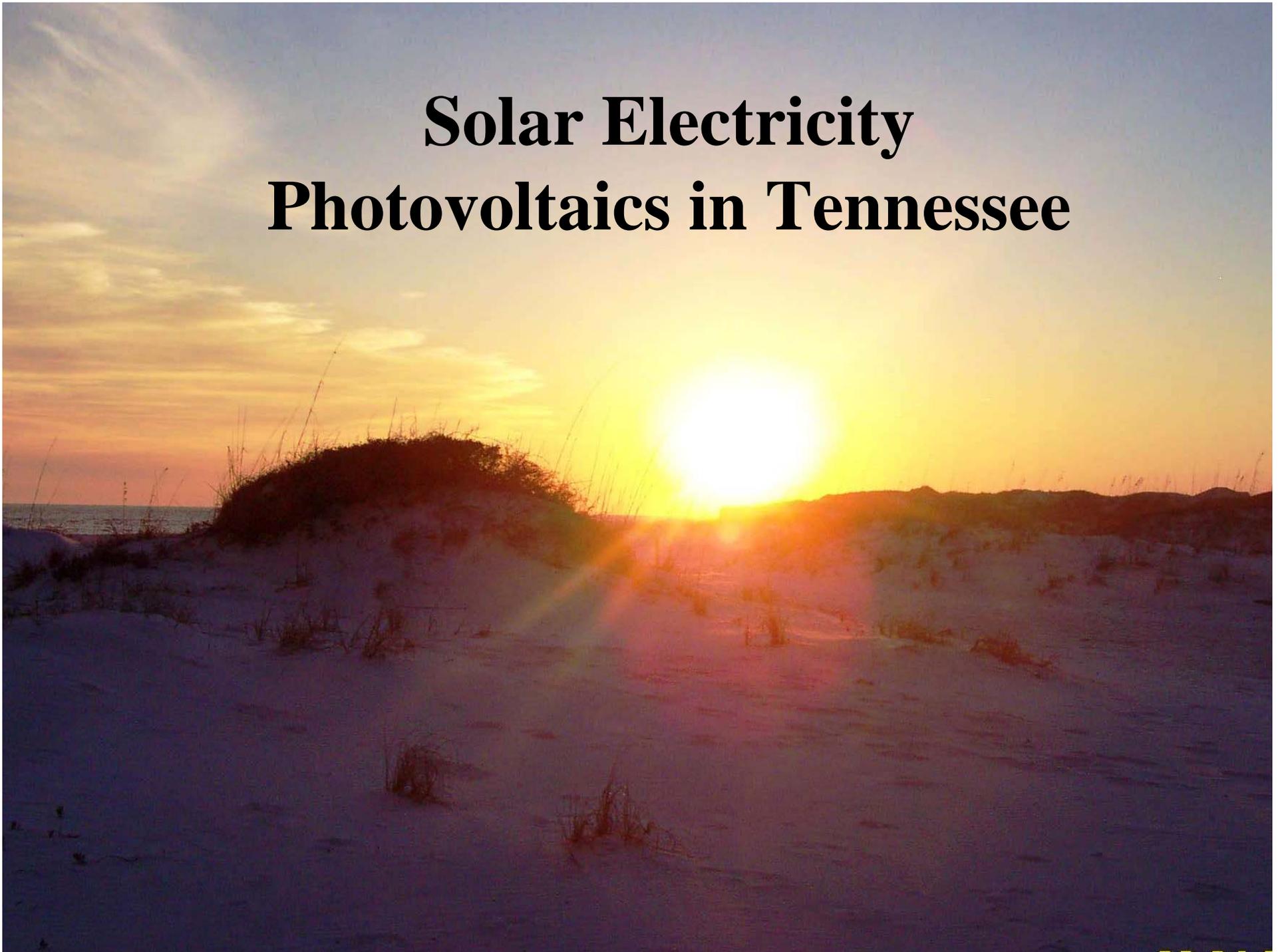


# **Solar Electricity Photovoltaics in Tennessee**



- PV is just starting to become accepted in Tennessee.
- It is looked on favorably by citizens
- There are manufacturing facilities for PV in the state.
- We have a good solar resource! 5 hours peak sun.
- More than Germany or Oregon for example.
  - Germany employs 30,000 in PV
  - Oregon has \$500 m in corporate investment coming by 2008 year end

# Incentives available in Tennessee

- Commercial
  - TN-CET grant available for existing for-profit businesses. (TN-Clean Energy Technology)
    - Building must be 3 years old, not in residence
    - 40% of installed cost, capped at \$75,000
  - 30% Federal Tax Credit – No Cap
  - Generation Partners pays 15 to 20 cents per kwh for all renewable electricity generated.
  - 5 years accelerated depreciation.

# Local Energy and Local Jobs

Every job manufacturing a solar panel creates four jobs in distribution, sales, design, installation, etc.

Tennessee has historically let the 4 associated jobs go to others.

# Street Dixon Rick Architects, Nashville





Street Dixon Rick  
Architects  
12kw  
208 V. 3 Phase  
Nashville

# Street Dixon Rick Architects, Nashville



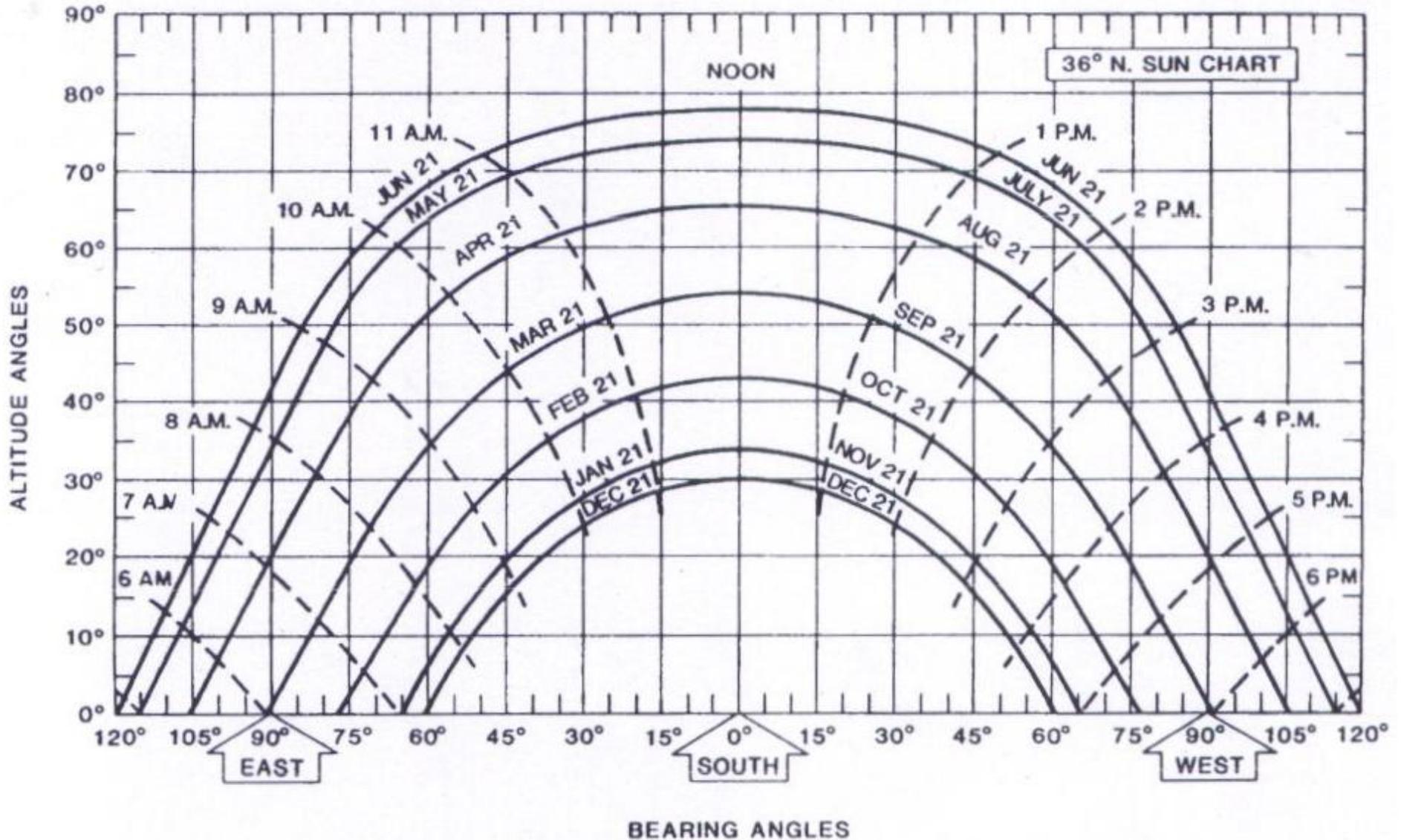




# Responsible Design and Installation

- NABCEP - North American Board of Certified Energy Practitioners
- Architects and Engineers must specify certified installation by trained personnel and consult with experienced PV designers.
- Systems that perform poorly because of improper design or installation reflect poorly on the industry and have a negative effect on public perception of photovoltaics.

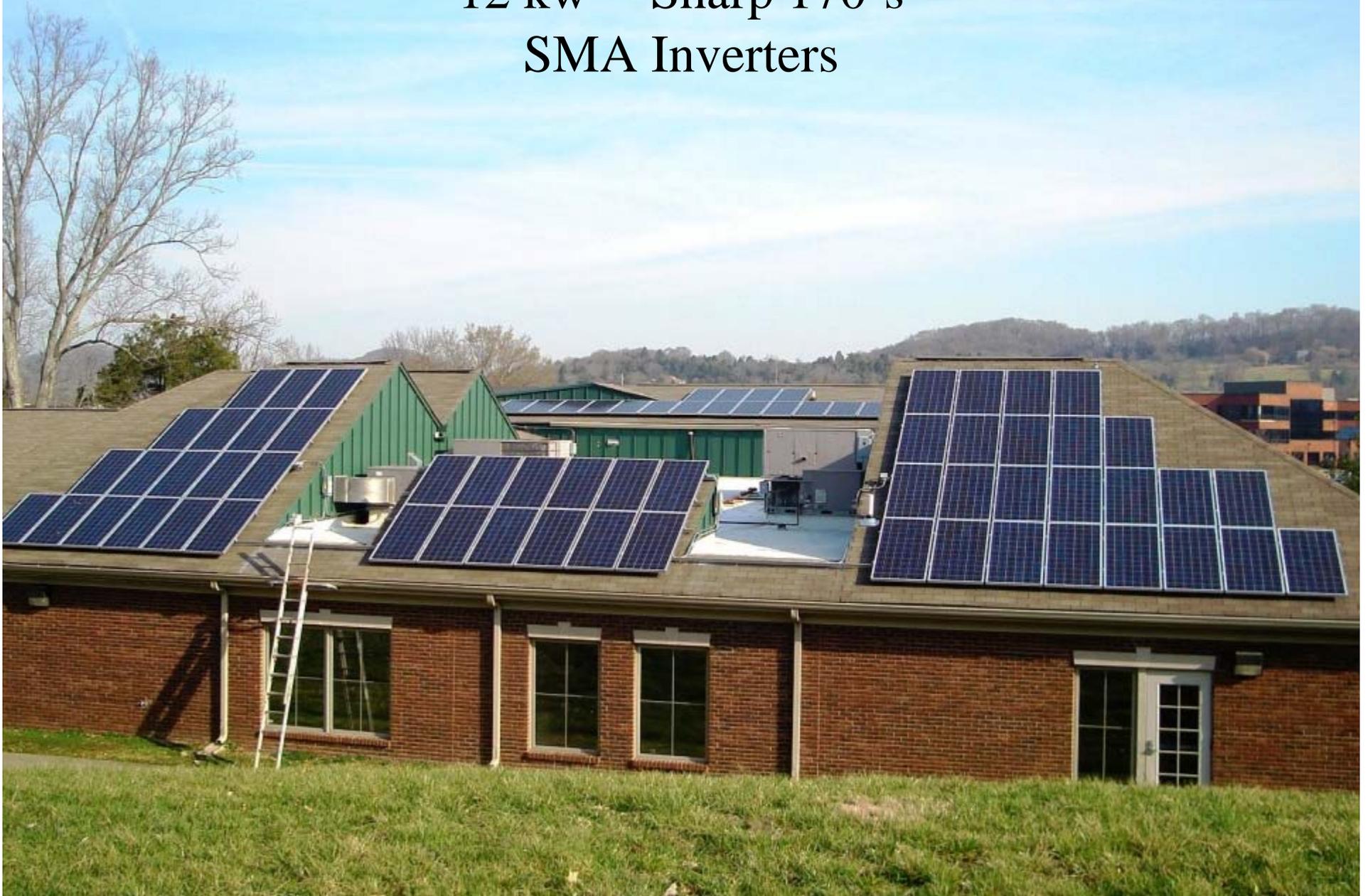
# Sun Chart 36° Northern Latitude



Mellow Mushroom,  
Knoxville



Caldwell Travel, Brentwood  
12 kw - Sharp 170's  
SMA Inverters



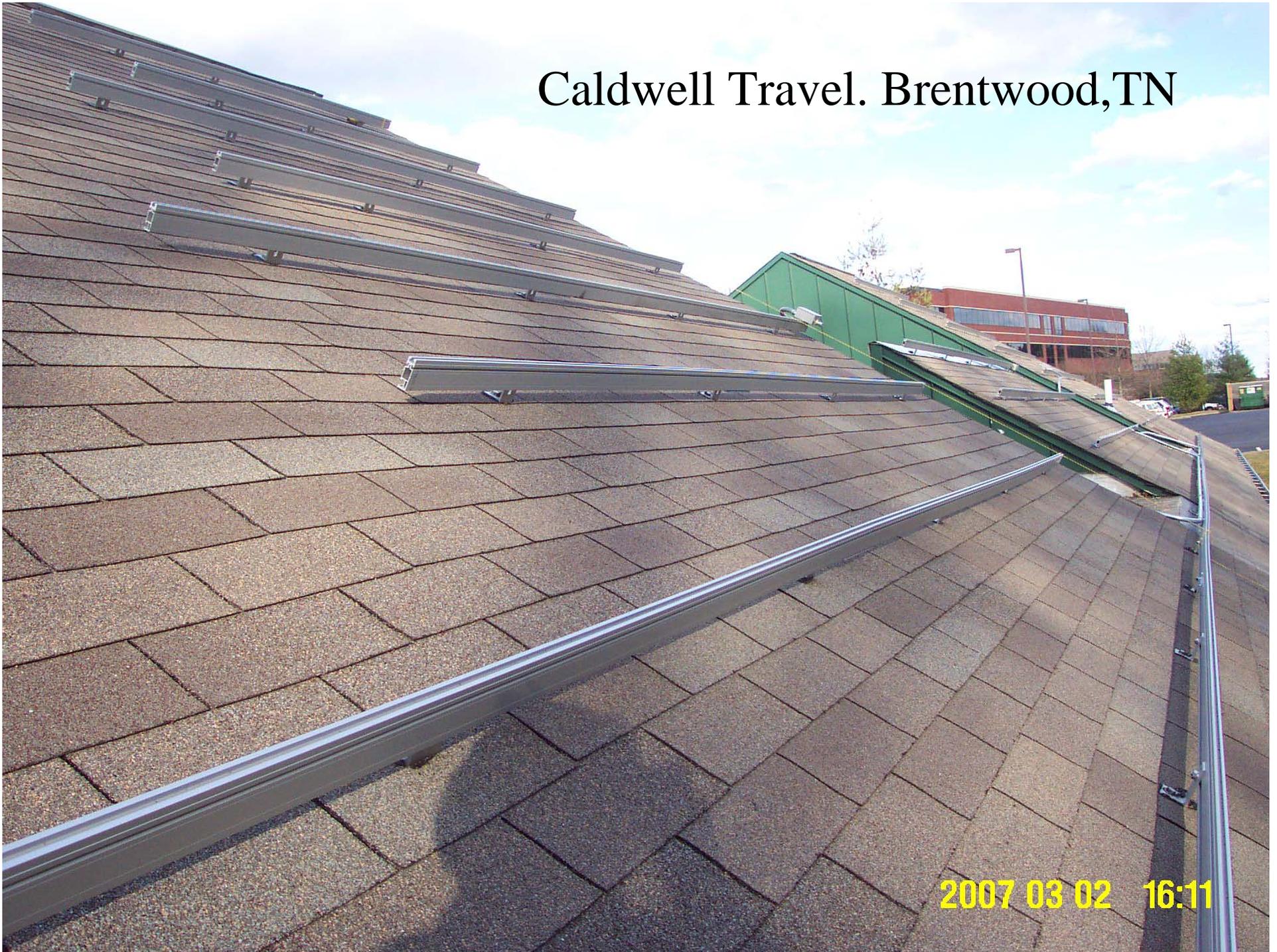
# Caldwell Travel, Brentwood



# Caldwell Travel. Brentwood, TN



Caldwell Travel. Brentwood, TN



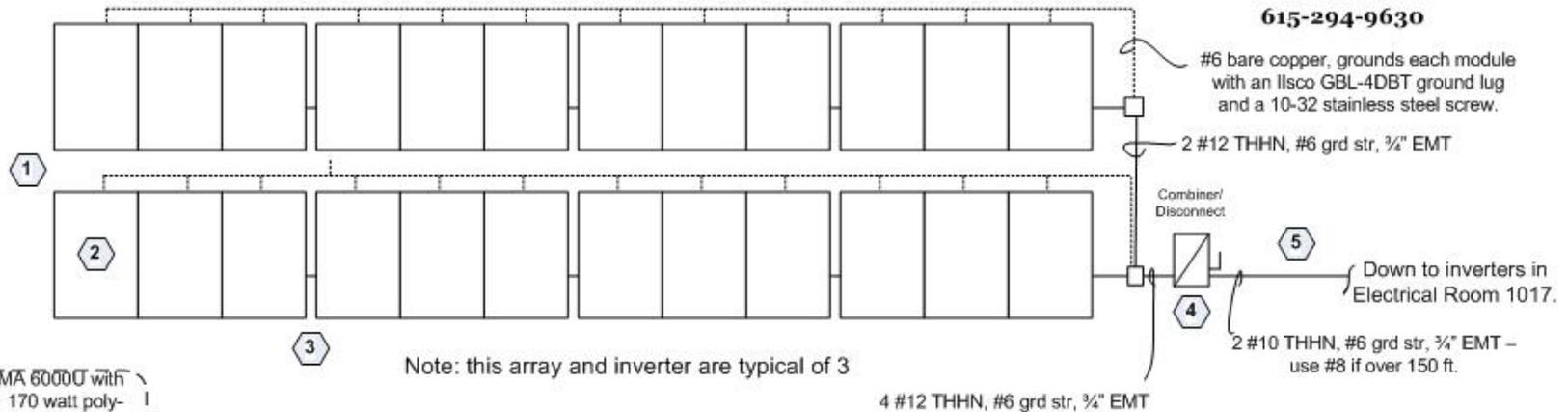
2007 03 02 16:11

# Caldwell Travel. Brentwood, TN



# FREEDOM CENTER, CITY OF CHARLOTTE N.C.

**LIGHTWAVE ELECTRIC  
STEVE JOHNSON  
615-294-9630**



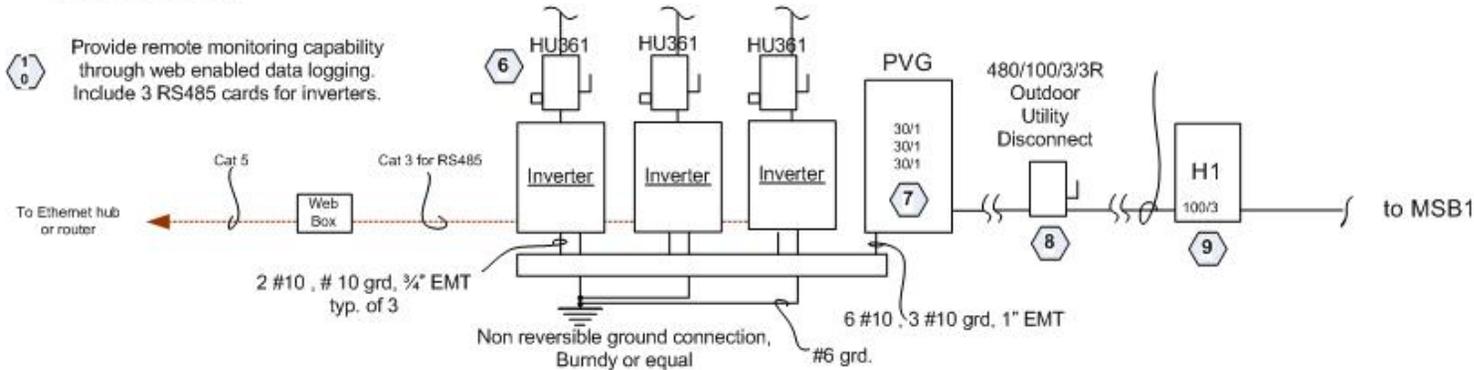
3 SMA 6000U with 72 - 170 watt polycrystalline modules used for purposes of calculations.

Note: this array and inverter are typical of 3

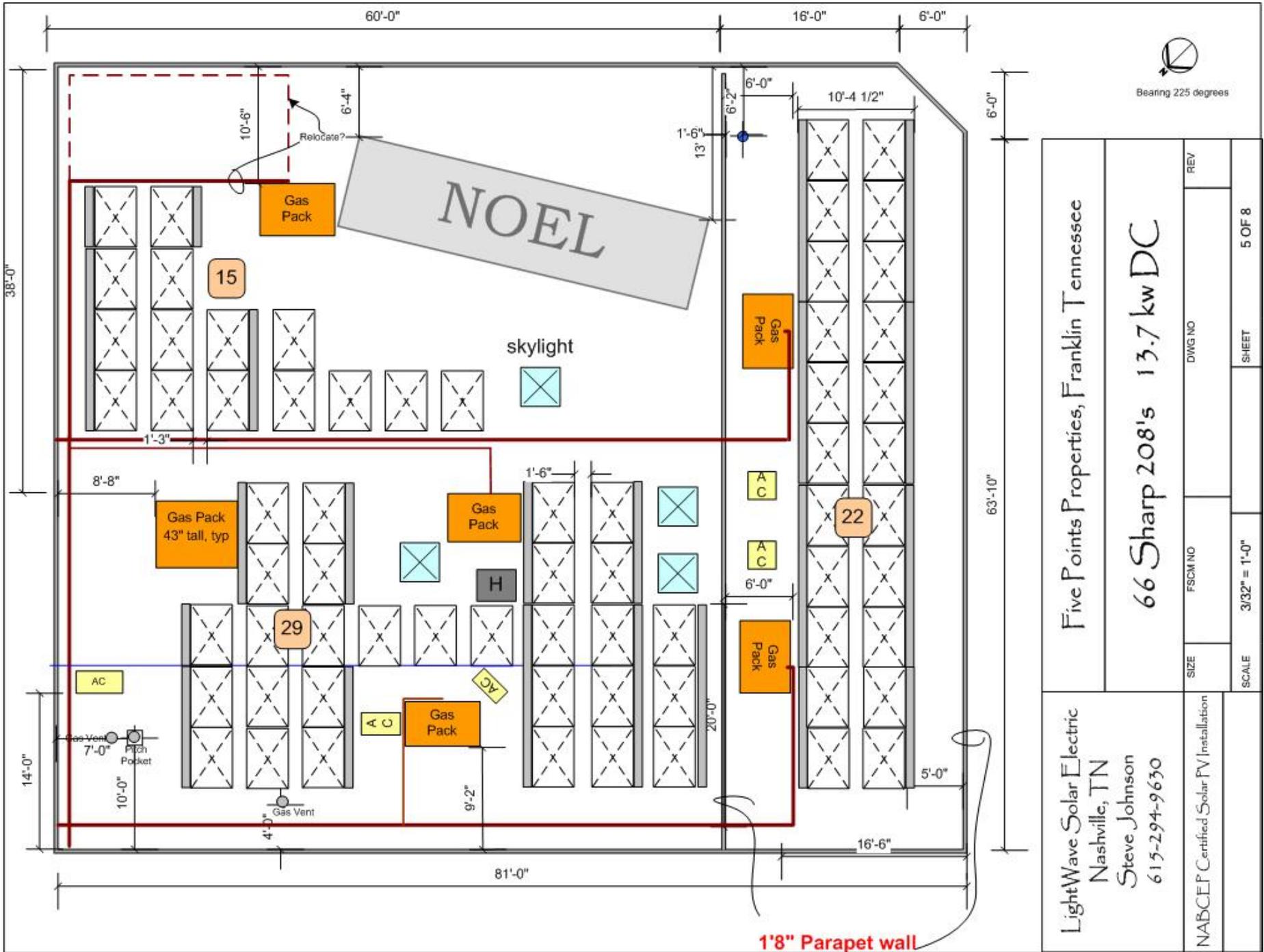
4 #12 THHN, #6 grd str, 3/4\" EMT

Down to inverters in Electrical Room 1017.  
2 #10 THHN, #6 grd str, 3/4\" EMT - use #8 if over 150 ft.

## South Wall of Elec. Room 1017



- 1 PV panels to be mounted on anodized aluminum low profile ballasted pan racks similar to Uni-Rac 310306 or equal. The ballasted racks must be weighted according to the manufacturers specifications for the wind speeds and exposure category in the installation area. All mounting hardware to be stainless steel.
- 2 PV panels are poly crystalline or crystalline and in the 160 to 180 w nominal range. If a different panel is used the source and output PV circuits will have to be confirmed during the submittal process.
- 3 Wiring between arrays must be in conduit. Series connctions between modules in factory provided MC cable acceptable if securely fastened to frame and not spanning any open space.
- 4 Combiner/Disconnect must be 600V DC rated. Do not switch negative conductor. Negative to be white and grounded at the inverter, not before. 10 amp source circuit fusing.
- 5 These circuits must have an ampacity of 1.56 times the solar panel Isc and be derated for 57 degrees C. Voltage drop to inverter must be les than 3.0%.
- 6 DC rated at 600 volts. One Lightning Arrestor, Delta LA602DC, at each disconnect. DO NOT switch negative grounded conductor.
- 7 PVG to have 200 amp bus and 3-30/1 277 V CB. One from each inverter.
- 8 100 amp 480V 3R disc., unfused unless required by utility. Located outdoor for utility access. This disconnect is to have a clearly legible label attached stating: "WARNING - ELECTRIC SHOCK HAZARD. TERMINAL ON BOTH THE LINE AND LOAD SIDE MAY BE ENERGIZED IN THE OPEN POSITION."
- 9 H1 to feed utility disconnect and PVG with 100/3 CB.



Five Points Properties, Franklin Tennessee		REV	
66 Sharp 208's 13.7 kw DC		DWG NO	
LightWave Solar Electric Nashville, TN Steve Johnson 615-294-9630		SIZE	5 OF 8
NABCEP Certified Solar PV Installation		FSCM NO	SHEET
		SCALE	3/32" = 1'-0"

# Nashville, Legal Office

## 6.8 kw



# Generation Partners

## Keep it at 15 cents!

**TVA's Generation Partners** pilot program is set to expire on December 31st of this year, and TVA intends to *reduce* what it pays from 15¢ to 10¢ a kWh.

The 15¢ purchase rate is a critical incentive for TVA homeowners and small businesses to install wind and solar generating capacity. This is the only renewable incentive available to churches, schools and non-profits.

- **Tell TVA to Keep Generation Partners at 15¢!**
- **Generation Partners Incentive**
- **GP Costs TVA Less than \$20,000.**
- **Green Power Switch Premium**
- **Peak Capacity Benefits**
- **Renewable Energy Future**
- 

Send your comments to TVA's Green Power Switch at [greenpowerswitch@tva.com](mailto:greenpowerswitch@tva.com)  
and cc your comments to [gil@cleanenergy.org](mailto:gil@cleanenergy.org)

For More Information, visit [www.SolarValleyCoalition.net](http://www.SolarValleyCoalition.net)

# Many Benefits

- Distributed Generation reduces stress on aging grid.
- Eliminates losses from long distance transmission by generating at the point of use.
- Helps reduce peak load for summer air conditioning.
- Not vulnerable to attack, improves national security.
- Environment:
  - Emissions
  - Carbon
  - Water - conserves

# Adventure Science Center, Nashville, TN TVA Installation



# Incentives available in Tennessee

- Residential

- \$2,000 Federal Tax Credit
- Generation Partners pays \$500 one time and 15 cents per kwh for all solar electricity generated.
- Tennessee has no state incentive for residential PV like 22 other states do.
- Call your representative and let them know YOU are interested in Tennessee's renewable energy, the jobs it creates and our environment.

# Cane Ridge, TN

Generation Partners with  
Nashville Electric Service





Nashville , TN





Local ordinance prohibits visibility from the street.

Paddock Residence, Cookeville, TN  
TVA Generation Partners, Upper Cumberland Utility Corp.

4kw Evergreen



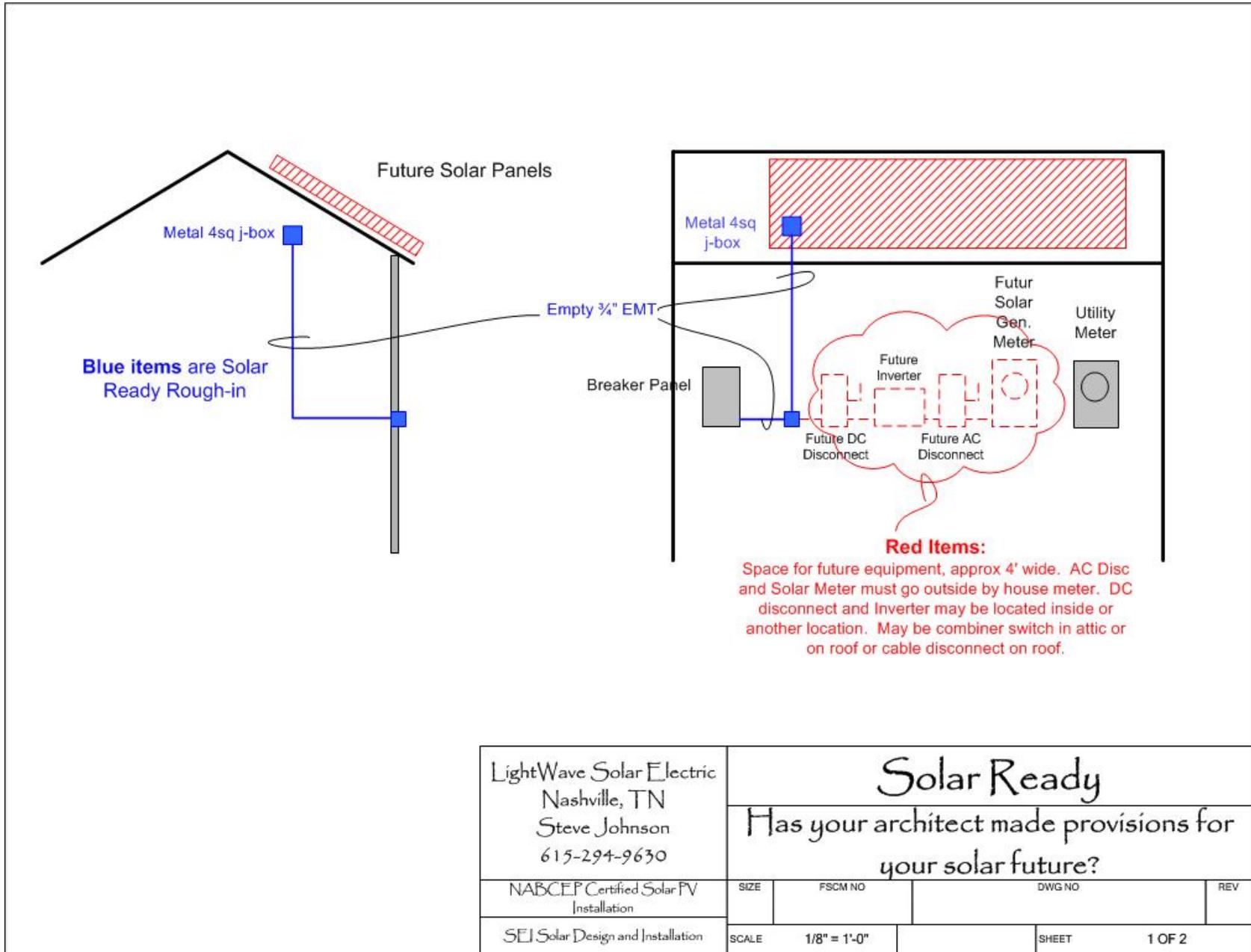


Not Solar Ready



Closer to being “Solar Ready”





LightWave Solar Electric  
 Nashville, TN  
 Steve Johnson  
 615-294-9630

**Solar Ready**  
 Has your architect made provisions for  
 your solar future?

NABCEP Certified Solar PV Installation	SIZE	FSCM NO	DWG NO	REV
SEI Solar Design and Installation	SCALE	1/8" = 1'-0"	SHEET	1 OF 2



# Sharp Triangular Panels



West Meade, Nashville, TN 2.5kw  
Nashville Electric Service, Generation Partners

# Forest Hills, Nashville

4kw of Sharp 170's, SMA Inverter





# What Tennessee can do to attract solar industry

- Stabilize existing programs
- TN-CET
- Generation Partners – keep it at 15¢ and let system owner keep the SREC's.
- State incentive for residential, non-profit, schools, new buildings
- State and TVA co-ordinate on solar-establish value of SREC's

# PV Industry Creates Good Jobs and Facilities

## *Making Sunny Boys, Germany*





PHEV's are coming

07 11 2006



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# Solar Grove - Kyocera





**Millennium SportsClub Vacaville**

**152 kW DC**



## Solar Porch in France





Judged “Most Outstanding in its Field”



Thank you for your  
time!

**LightWave Solar Electric**  
**stevejohnson@comcast.net**

**615-294-9630**  
**www.lightwavesolarelectric.com**

**Steve Johnson**

