The Good, Bad and Beautiful of Putting PV on Your Home

Zero Energy Homes Workshop
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Photovoltaics

• ~$10,000/kilowatt installed. Less if self installed.
• Modular
• Can be installed on roofs, ground, pole, other options
• Long lifetime (>25 years)
• 9-15% efficient
• Industry Growing rapidly
Adding PV to a New Home

• I have an energy efficient home, now what?
  – Add PV or not?’

• What do I need to do to get ready for PV?
  – Now or later?
  – Mounting considerations
  – Siting
What’s Out There?

• What is the supply?
  – Rumors
  – Truth

• What is the availability
  – Local vs non-local
  – Warranties
  – Service
PV System Components

- PV Array
- Batteries
- Control
- Load
- Inverter
- Wiring
PV Arrays:

- PV arrays – made up of PV modules or panels
- PV modules – made up of PV cells
Inverter

• Located between DC generation and AC load
• Provides household (120VAC) from battery storage
• 120v or 240v AC @ 60 Hertz
• Provides medium or high quality AC Power
• May provide high power when needed (many inverters can surge up to 3 times their rated capacity.)
Inverters: DC to AC

- Efficiency generally exceeds 90% except at low loads
- Pure sine wave (no harmonics – suitable for grid connection) and modified sine wave (with harmonics) available
- Cost: ~ $1/watt
Minor Components: Junction boxes, conduit, etc:
PV Systems Configurations

- PV direct to load (day use)
- PV with battery storage
- PV with battery / inverter
- Utility grid connected PV – batteryless
- Utility grid connected PV - with battery
- PV hybrid systems
Utility Grid Connected PV - Batteryless

48 Volt PV Array: 3 modules at 16 volts (max power) in series
Utility Grid Connected PV - with Battery
PV Hybrid Systems

- PV – Wind Hybrid
- PV – Genset Hybrid
- PV – Wind - Genset
Okay, take a break