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

## Zero Energy Homes Workshop

**June 20, 2008**

**Marlene Brown**

**President New Mexico Solar Energy Association**

**www.nmsea.org**

**mbwildwoman@mcleodusa.net**

# 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

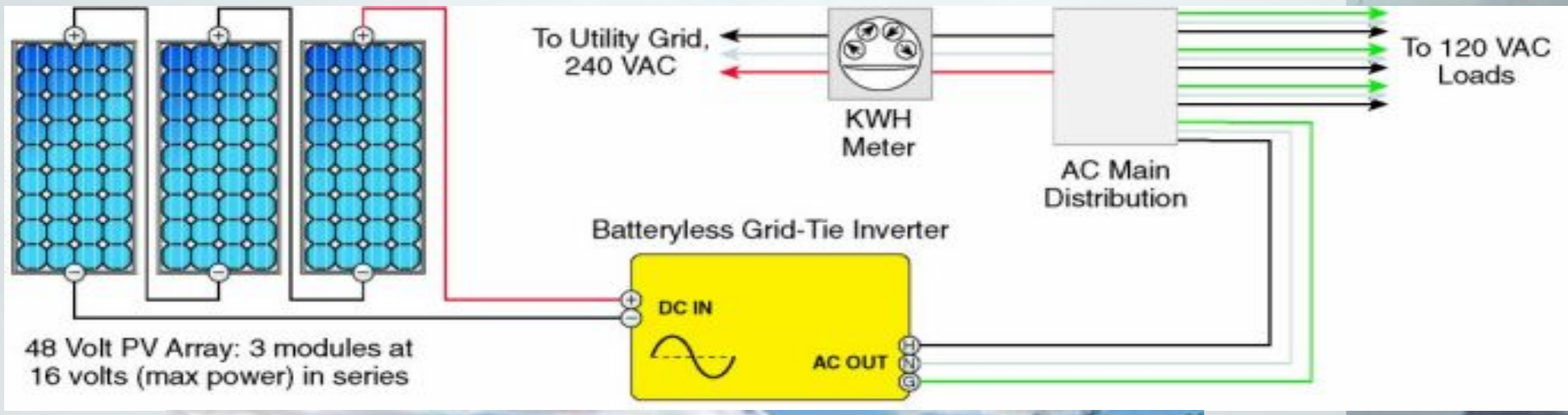
- **Efficiency generally exceeds 90% except at low loads**
- **Pure sine wave (no harmonics – suitable for grid connection) and modified sine wave (with harmonics) available**
- **Cost: ~ $1/watt**

# Minor Components: Junction boxes, conduit, etc:

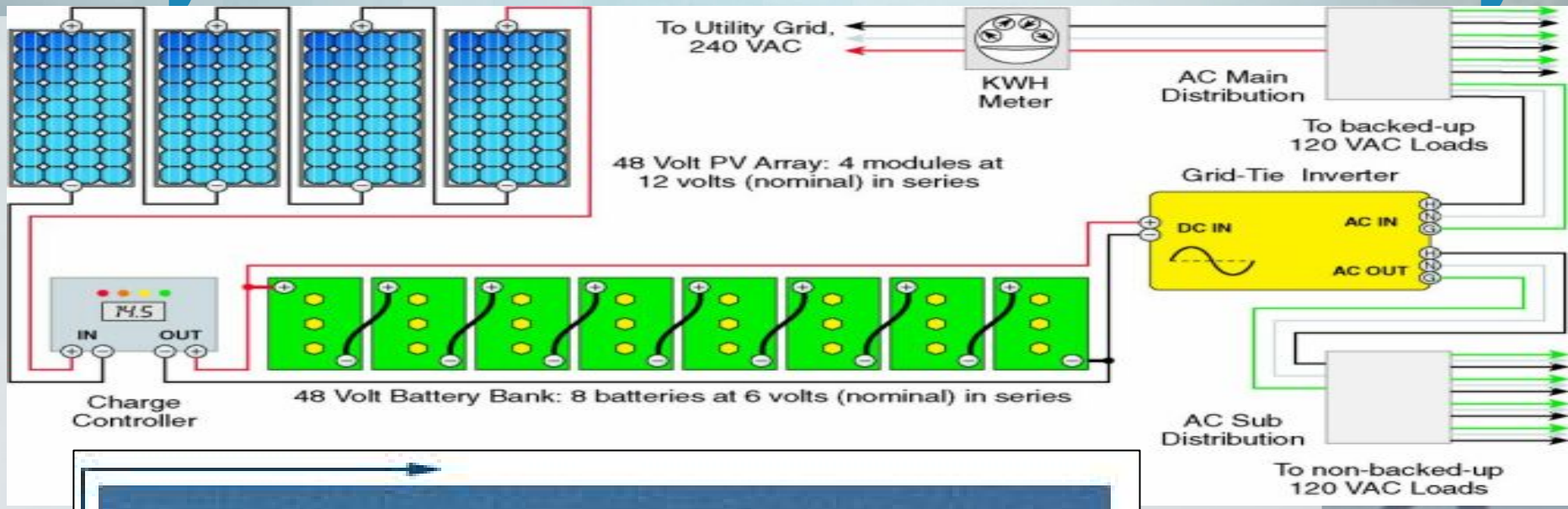
# PV Systems Configurations

- 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




# Utility Grid Connected PV - with Battery




# PV Hybrid Systems

- **PV – Wind Hybrid**
- **PV – Genset Hybrid**
- **PV – Wind - Genset**

# Okay, take a break