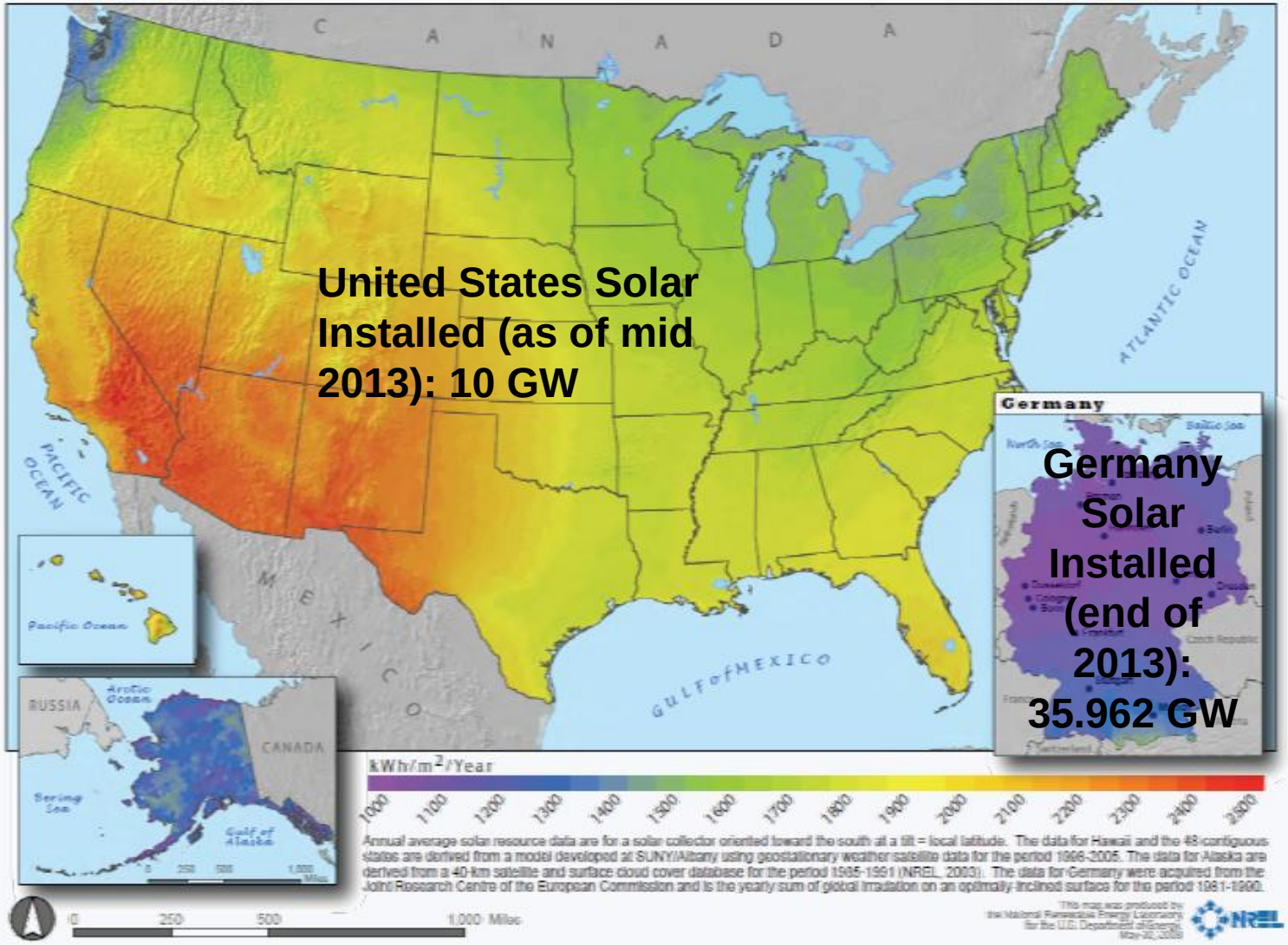

SOLARIZE
Texas

All of Texas Has Excellent Solar Resources



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U.S. Department of Energy

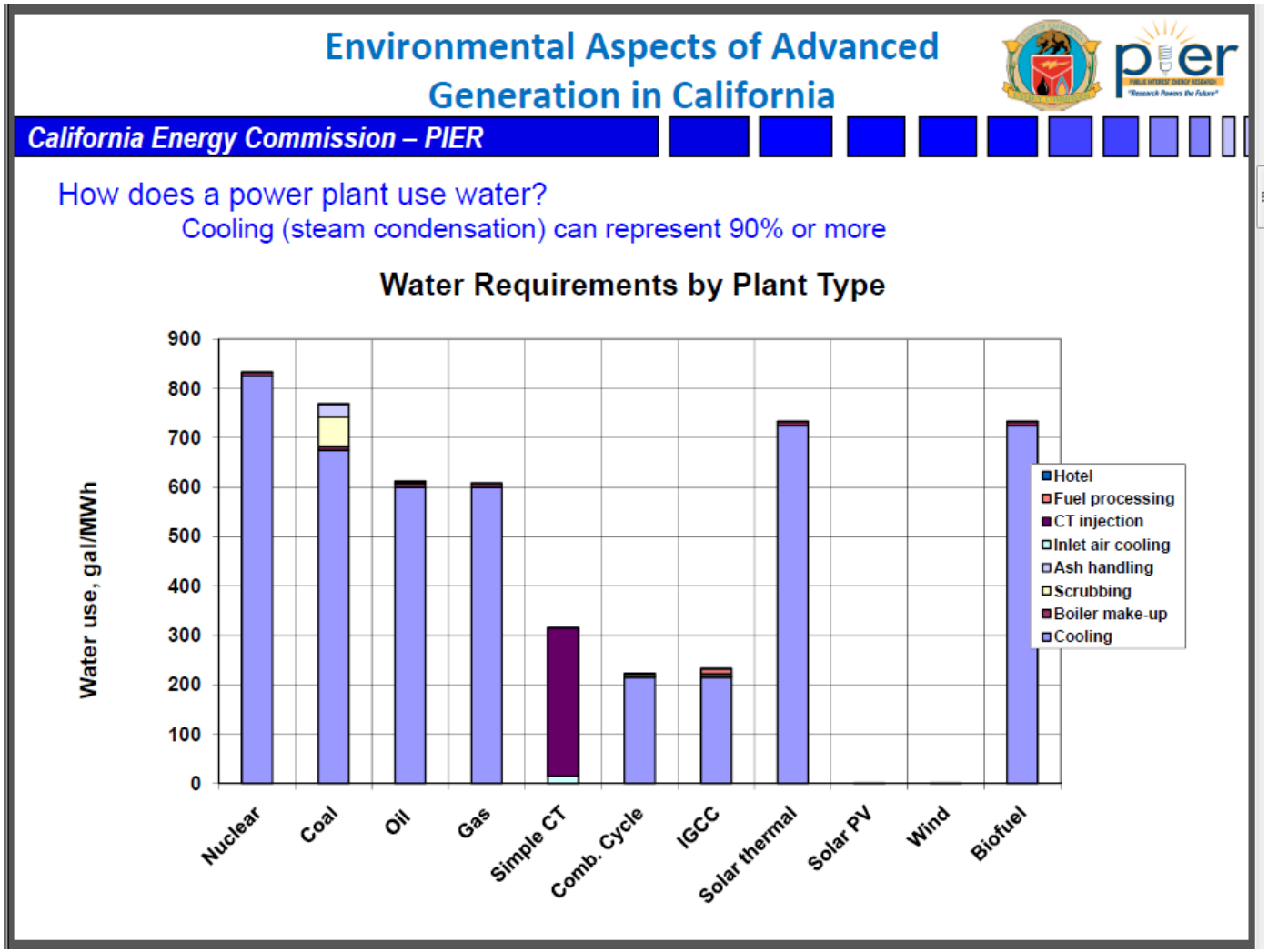
Source: National Renewable Energy Laboratory

Benefits of Solar

Investing in Solar Creates Good Local Jobs

- Almost half of all solar jobs are in installation
  - Installation jobs cannot be outsourced
  - Installers earn an average of $23.63 per hour
- Electricians, roofers, designers, salesmen, plumbers, HVAC technicians all have needed skills for solar installation businesses.
- Over 142,000 solar jobs in the US (up20% from 2012, compared to 1.9% job growth in all sectors)
  - Texas now home to 4,100 solar jobs (up 28% from 2012) – many in Austin and San Antonio, but growing in other areas
  - Although Texas ranks 6th in number of solar jobs, we are 44th in solar jobs per capita – so we have lots of room for growth

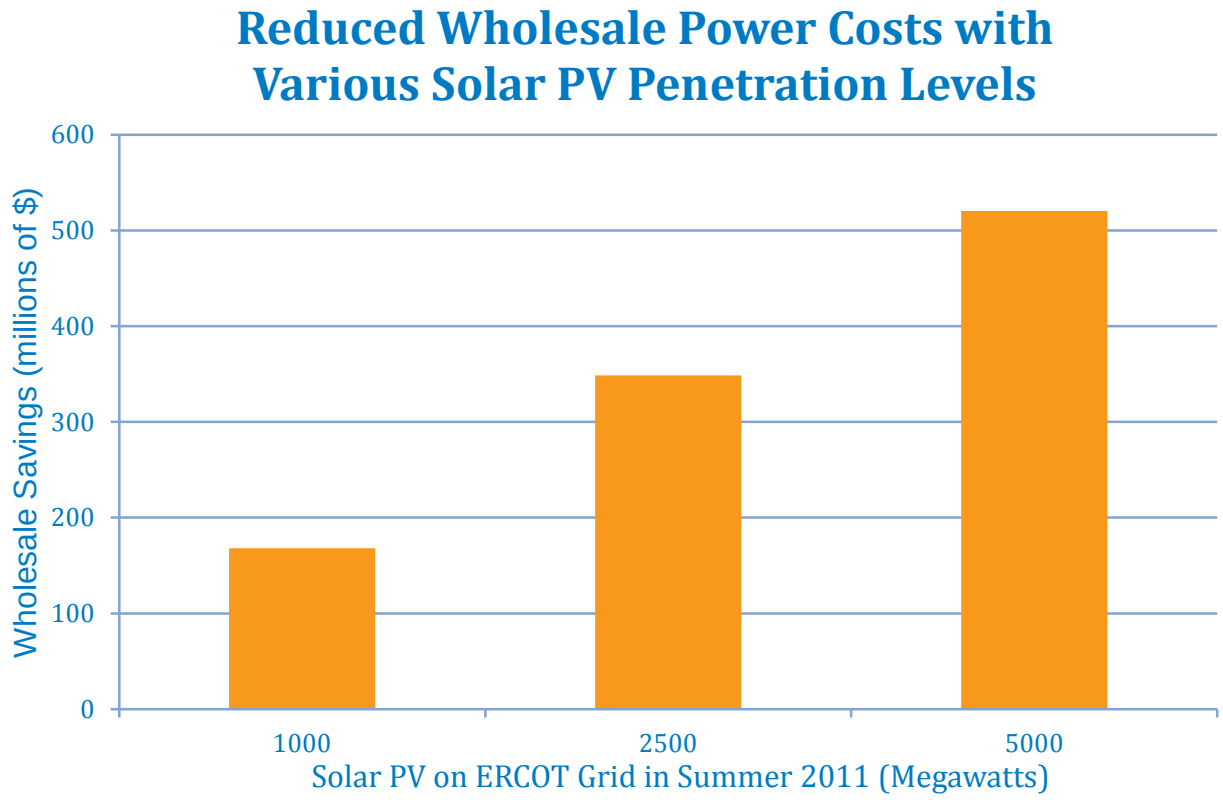
Solar Energy Reduces Water Use



www.cuwcc.org/WorkArea/downloadasset.aspx?id=18784

Reduce Grid Energy Costs

- Solar produces the most on hot, sunny days, when demand for energy is high.
- Prices spike when demand is high, so more people using solar brings down energy costs on the grid overall.



http://www.seia.org/research-resources/potential-impact-solar-pv-electricity-markets-texas

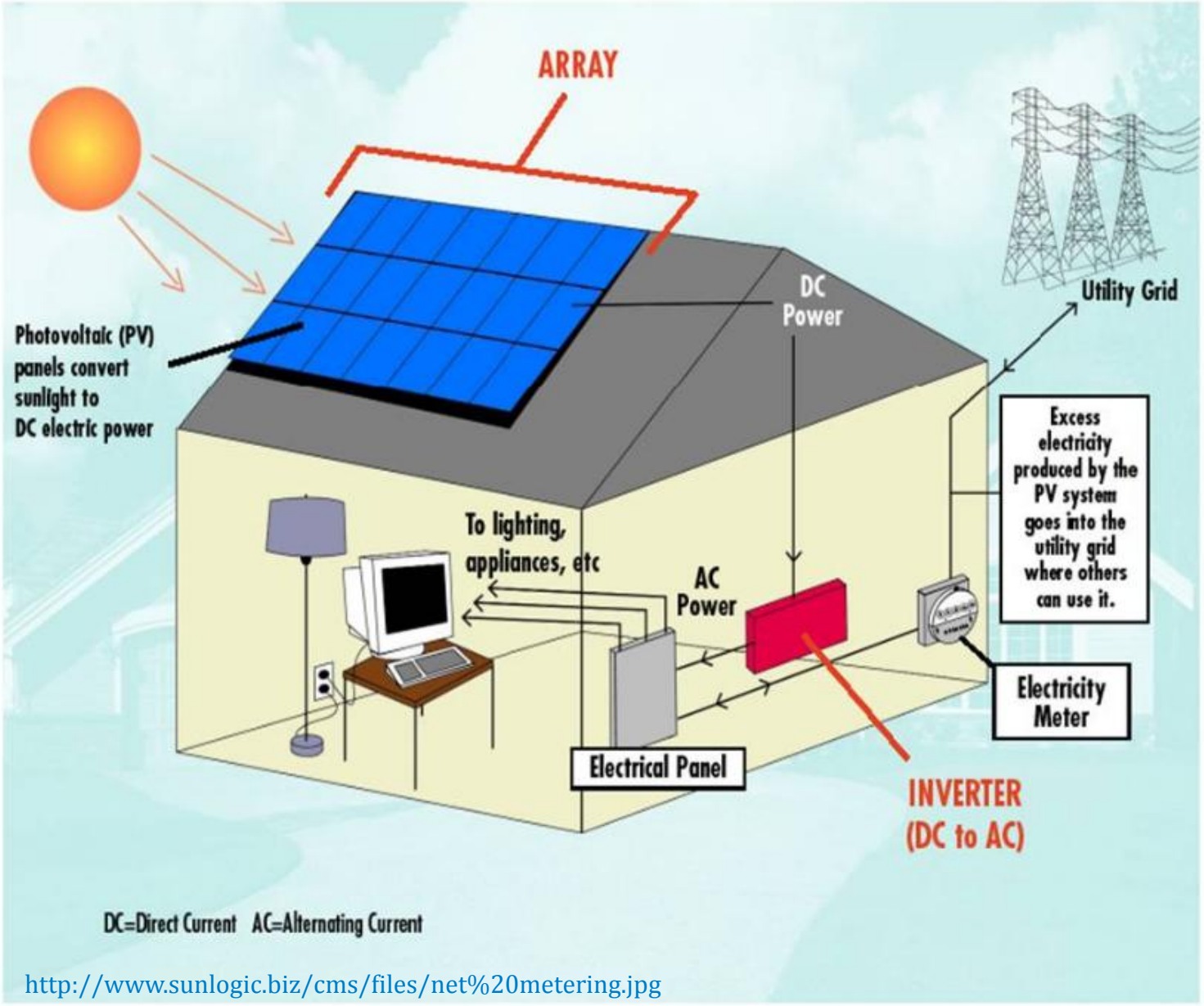
KiloWHAT?

- Energy **capacity** is measured in **kilowatts (kW)**
  - 1 kW is equal to 1,000 watts (w)
  - The kW capacity is the greatest amount of energy that a system can produce at any one time.
  - The sun doesn't shine all the time, so solar systems won't always be producing at maximum capacity (and not at all at night).
- Energy **production** (and use) is measured in **kilowatt hours (kWh)**.
  - You need to know your average monthly energy usage in kWh to properly size a solar system.
  - Payback will be quickest for solar systems that offset energy used on a monthly basis, with out much excess production..

How Solar Energy Works

- Photovoltaic (PV) solar panels convert sunlight directly into electricity.
- PV **cells** are manufactured together to form a **solar panel**.
- Solar **panels** are installed together to form a **solar array**.
- For residential and commercial solar arrays, inverters are needed to convert the electricity from direct current to alternating current.
  - **String inverters** connect to several panels wired together. They are cheaper, but they limit production from all panels to the level of production from the least productive panel. They are best for arrays where all panels face the same direction and none of the panels will be shaded.
  - **Micro inverters** are connected individually to each panel. The are somewhat more expensive, but allow maximum output from each panel and allow for real time energy production monitoring of each panel. They are best for places where some panels may be shaded or are facing different directions.

How Solar Works on a Home



http://www.sunlogic.biz/cms/files/net%20metering.jpg

Financial Considerations

- Federal Solar Investment Tax Credit: up to 30% of cost with no upper limit
- Texas Property Tax Incentive: renewable energy 100% tax exempt
- Net metering with payment for excess energy put out onto the electric grid for others to use
  - Offset purchasing energy at retail rates
  - Bill credit or a check for excess energy produced in a given month or year (generally at the wholesale rate)
  - With net metering, systems should be sized to approximate average monthly or yearly usage, depending on your utility's net metering policy.

Reduce Your Energy Costs

- Even without rebates, solar systems pay off in less than 15 years in most parts of Texas
  - Discounts from Solarize group purchasing reduce the payback time further
  - Systems are usually warrantied to achieve high production levels for 25 years, and can last years longer – that's **free electricity for at least 10 years**
- Energy from utilities is often from coal and natural gas
  - Coal-fired generators are becoming more expensive
  - Natural gas prices go up and down a lot and will likely never be lower than they are now
- Texas is considering a new system that would give energy companies extra payments, even if they don't produce energy. This will raise prices for consumers.

What is Solarize?

- Solarize is a term used for solar group purchasing programs.
  - Customers purchase individual installations for their property, but at a discounted price.
  - Generally for residential installations
- Solarize programs have a strong educational component.
- The Solarize Guidebook: A Community Guide to Collective Purchasing of Residential PV Systems was prepared for the U.S. Department of Energy's SunShot Initiative. The guidebook is intended to be a roadmap for project planners and solar advocates who want to create their own successful Solarize campaigns. It describes the key elements of the Solarize Portland campaigns and variations from projects across the country, along with lessons learned and planning templates.
- The Purchasing Solar Collectively with Solarize video provides an overview of the concept.

Why Solarize?

- **Save Money**
  - Solar installers will discount the fees for their services because the closing rate for contracts is much higher than normal.
  - Usually the larger the combined installation is, the greater the discount
- **Education**
  - Solarize programs help educate the community about the benefits of solar, which can help increase the rate of solar adoption.
  - Solarize participants help each other ask smart questions and will be better educated consumers.

Program Administration

- Solarize programs can be run by nonprofit organizations, community groups, utilities, or government agencies.
  - In Texas, it isn't very likely that a government agency is going to run such a program.
  - Utilities are most likely to get interested if strong interest is shown by the community.
    - Partnerships with utilities can be valuable.
    - Solarize Plano got the Plano water utility to advertise the program with bill inserts.
- Local volunteers are critical to the success of a solarize program.

Contracting

- Choice of installer can be made in different ways:
  - Solarize participants form a committee to review proposals from companies.
    - Benefits: Participants get involved and educated about solar and the contracting process.
    - Drawback: Takes time from dedicated volunteers; members of the committee may not agree
  - Solarize program administrators contract with companies up front.
    - Benefit: Reduces work for participants; "expert" can make decision
    - Drawbacks: Participants may wish to examine other options and won't be as educated about the process.
- Solarize programs often go through multiple contracting phases.
  - Later iterations are often more successful than the initial phase.
  - Education builds to expand success in later phases.
- **Although the group will use its collective buying power to get a discount, each customer still signs a contract with the installer for his or her own installation, after a site visit.**

Solarize Program Components

- Establish program leaders and points of contact
- Recruit volunteers
- Develop partnerships (utilities, businesses, etc.)
- Educational and outreach events
- Enroll potential participants
- Establish contracting committee
  - Issue requests for proposals from solar installers
  - Select contractor
- Potential customers get site assessments from contractor
- Sign contracts (individuals sign w/ solar installer)
- Get solar systems installed
- Start generating you own energy!

Solar Installation Cost Example

- **Key Assumptions:**
  - If installed retail cost of $3.40/watt (example price per watt)
  - South facing exposure for solar panels (typical panel (3' x 5') is rated at about 240W dc)
  - In central Texas area, **1 kWdc-p** creates about **1,350 kWh** per year
  - Annual electricity usage for this example is **10,000 kWh**
  - **25 year warrantied lifetime** of solar panels (but they can actually last 30-40 years)
- **Example System Size and Annual Production Calculations:**
  - 10 panels - approx 2.4kW PV solar, produce 3,240 kWh/yr, approx 32% of annual usage
  - 15 panels - approx 3.6kW PV solar, produce 4,860 kWh/yr, approx 49% of annual usage
  - 20 panels - approx 4.8kW PV solar, produce 6,480 kWh/yr, approx 65% of annual usage
- **System Cost Calculations for Small System (10 panels/2.4kWdc-p):**
  - 2400 Wdc-p (2.4kWdc-p) installed system at $3.40/W = $8,160
  - After 20% group purchase discount = $8,160 x .8 = $6,528
  - After 30% federal renewable energy investment tax credit = $6,528 x .7 = **$4,570**
  - Net price per Wdc-p: $1.90
- **Lifetime Production and Cost for Small System (10 panels/2.4kWdc-p):**
  - 25 years x 3,240 kWh/yr = **81,000 kWh**
  - Net installed system cost $4,570 / 81,000 kWh = **$0.056/kWh** (not including maintenance costs or module degradation – panels warrantied to produce at 87.5% at 25 years)
  - Already cheaper than retail electricity ($0.104 for this example)
- **Payback**
  - 3,240 kWh/yr * $0.104/kWh = **$336.96/yr**
  - $4,570 / $336.96/yr = **13.6years**
  - Factoring in 3% electric price escalation brings payback to **12.6 years**

Frequently Asked Questions

- Q: Will hail damage my solar panels?
  - A: Not unless it is very large. Solar panels are made with tempered glass and must be tested to withstand 1 inch hail.
    - Tip: Solar owners should update their homeowners insurance to include their solar installations.
- Q: Is my roof right for a solar installation?
  - A: Solar panels will work best on south, southeast, southwest or west facing roofs with little or no shade.
    - Tip: The solar installer will conduct a site inspection of your property before you receive a contract to sign. This should include an evaluation of your roof condition. Old roofs may need replacing before solar is installed.
- Q: Will my homeowners' association let me use solar?
  - A: Under Texas law, HOAs cannot prohibit solar installations, but they can require an approval process with certain limitations.
    - Tip: If you have an HOA, talk to your neighbors first. If you convince your neighbors it won't be a problem for them and follow some basic guidelines, you'll be in the clear.

Please contact me if you are interested in learning more or volunteering:

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PUBLIC CITIZEN

www.SolarizeTexas.org