Everything You Always Wanted to Know About Solar But Were Too Afraid to Ask
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- What is a PPA and how is it different from a Purchase?
- How is a site qualified for solar energy production?
- Equipment and Functionality
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- Is now a good time to go solar?
PPA vs. Purchase

- **PPA** stands for Power Purchase Agreement and is defined by the EPA as a financial arrangement in which a third-party developer owns, operates, and maintains the photovoltaic system, and a host customer agrees to site the system on its roof and purchases the system’s electric output from the solar services provider for a predetermined period at a predetermined rate.

- Purchase plan is when homeowner purchases the equipment through a licensed contractor who offers a turn-key service including parts, labor, permitting, incentive paperwork, and typically a 10 year warranty.

- System owner directly receives tax benefits and other incentives.

- Purchase can also be done in a DIY manner. Panels and equipment can be ordered online.
What does a PPA look like?

- Solar PPA rates are typically less than the local utility and are either fixed or have a low annual increase over a 20 year period.
- Customer agrees to rate plan and payments are made on budget billing/fixed monthly cost. Monitoring allows the end of year “true-up” analysis.
- Third party owner benefits from selling power and also valuable tax credits, depreciation and other local incentives.
- Homeowner benefits from use of cheaper, clean energy for no out of pocket costs as well as no responsibility or liability for equipment malfunction or underperformance.
- Example: MD Pepco customer pays $0.14/kWh for power. They enter into a PPA to pay $0.11/kWh for solar power monthly.
What does a Purchase Look Like?

- Homeowner owns the panels and all equipment
- Large upfront investment is followed by 30% tax credit from federal government, state grant (if applicable), and SREC income (if applicable)
- Owner is responsible for monitoring production, insuring equipment, replacing inverter
- No timeline or contractual period---panels can outlast warranty and produce electricity

Example: Homeowner buys 5.00 kW system
- Gross system cost---$25,000
- Federal Tax Credit------$7,500
- MD state grant----------$1,000
- 5 yr. SREC income---~$4,000
- Net System Cost------$12,500
Maryland Market Trends Toward PPA

- According to solar grant applications to the Maryland Energy Administration for both third party owned and purchased solar PV systems
  - Q4 2011
    - 48% of systems were 3rd party owned
  - Q1 2012
    - 54% of systems were 3rd party owned
  - Q2 2012
    - 60% of systems were 3rd party owned
Qualifying a Site for Solar Energy Production
Considerations

- Look at satellite
  - Google Earth, Google maps, Bing Maps, Zillow
- Roof material and usable space (composite shingle, 350 sq. ft. +)
- Shade (75% + solar access)
- Pitch (22-39 degrees depending on azimuth)
- Orientation
  - W, SW, S, SE, E
Shading and TSRF

- Shading analysis conducted with a Solmetric SunEye

- When solar access reading is combined with site qualities such as pitch, azimuth and geographical location, the TOTAL SOLAR RESOURCE FRACTION can be determined

- Sites with TSRF between 70-100% qualify for MD and DC grants
What is the Technology and how does it work?
Grid-Tied Photovoltaics

- DC → AC conversion at site of inverter (s)
- Excess electricity feeds back to grid---- battery back-up optional
- Net-metering gives 1:1 credit for excess power
- Array cannot produce more than 200% of usage in MD and 100% in DC
- Average offset is 40-50%
Panel Technology

- Poly-crystalline silicon PV panels
- Typical module efficiencies range from 14-15% and tolerance ranges of -5/+5%
- Standard size of 3.25’ x 5.5’ fit with most racking systems
- Manufacturers that SolarCity use include Kyocera, Trina, Yingli and others
- Options for Made in USA
- Options for color of frame—black or silver
Inverter Technology

Central inverter

Microinverters
Overall Process

- Free site analysis/Consultation
- Engineering site audit
- Designs
- Permits
- Construction
- County/City inspection
- Utility Interconnection
- Monitoring production
Case Study: Meet the Efird’s

- Karen and Roger Efird of Olney, MD
- Karen is in medical diagnostic sales and has been trying to find a way to lower electric bill for years---insulation and new HVAC only went so far
- Roger is retired from SEIA as chairman of the board and has a 25 year history in the solar industry---wholehearted belief in clean energy, but never had funds to invest in purchase

4.81 kW Solar PV array produces 5,860 kWh per year
System Design and Offset

**Electricity Use and Utility Pricing**

**Efrid Residence**

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<tr>
<th><strong>UTILITY COSTS BEFORE SOLARCITY</strong></th>
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<td>PEPCO Price of Power (AVG)</td>
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<td>Annual PEPCO Bill</td>
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<td>PEPCO Price of Remaining Power (AVG)</td>
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<td>PEPCO Price of Avoided Power (AVG)</td>
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<tr>
<td>PEPCO Bill Savings</td>
<td>50%</td>
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## Payment Options

### Utility

**Your Costs Without Solar**
- PEPCO Price (Avoided 1st Yr Avg): **14.0¢/kWh**
- Annual Increase (Expected): **4.8%**
- Monthly Payment: **$171.36**
- Total Costs (Over 20 Years): **$66,575**

### SolarPPA™

**Pay As You Go Plan**
- SolarCity Price (1st Yr): **11.5¢/kWh**
- Annual Increase: **2.9%**
- Initial Payment: **$0**
- Monthly Payment: **$70**
- Total Savings (Over 20 Years): **$10,190**

**Custom Plan**
- SolarCity Price (1st Yr Monthly): **8.7¢/kWh**
- Initial Payment: **$3,640**
- Monthly Payment: **$53**
- Total Savings (Over 20 Years): **$15,729**

**Prepay Plan**
- SolarCity Price (20 Yr Avg): **6.7¢/kWh**
- Initial Payment: **$9,430**
- Monthly Payment: **—**
- Total Savings (Over 20 Years): **$22,105**

### Service Package

- **Home Energy Evaluation.** A comprehensive energy audit and report that prioritizes energy improvements. Optional for $299.
- **SolarGuard® Monitoring.** We continuously monitor your system and will respond in the unlikely event that it underperforms.
- **Extended Warranty & Repair Service** We take care of any repair costs such as the inverter replacement, so you will not have to worry about it.
- **Insurance Coverage.** Our all-inclusive system coverage protects against damage or theft.
- **Performance Guarantee.** We guarantee that your system will produce as much electricity as we promise or we will pay you back!

### Purchase

**You Own the System**
- SolarCity Price (20 Yr Avg): **8.5¢/kWh**
- System Cost: **$27,450**
- Out of Pocket: **$26,450**
- Net Cost: **$11,872**
- Total Savings (Over 20 Years): **$16,986**

**Standard Service Package**

Premium Service Available for Additional Cost
Where are they now?

- **April 2011** - contract signing/site audit for Fully Pre-Paid PPA at 6.7 cents per kWh
- **July 2011** - system installed
- **September 2011** - system interconnected and turned on
- **October 2011** - Hosted solar house party and 3 other homes in the neighborhood went solar!
- **September 2012** - system produced 6,305 kWh over its first year which is 108% of the guaranteed amount
  - Total yearly Pepco expense dropped 57%
When is the best time to go solar?

- Between PPA and purchase, there are several options to choose from
- Decreases carbon footprint, saves money, adds value to home
- Panel prices have decreased significantly over the past 4 years
- Incentives are still available
  - ITC expires 2016
  - MD state grant
  - SREC value