ENERGY SOLUTIONS, LLC.

ENERGY SOLUTIONS, LLC

The Company

Established 2005

Our Mission:

To develop state of the art renewable energy generation and energy conservation products for the commercial and residential markets; and with the success of these products to extend their use to impoverished regions of the globe.

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It's Founder

Bill DeVillier, P.E.

- B.S. Electrical Engineering (Magna Cum Laude) 1992

- Licensed Professional Engineer in Louisiana

Work History:

Dow	Texas Operations	(Energy Systems and Power Production Units)
AMD	Austin, Texas	(Microprocessor Development Engineer - AM386 and AM486)
Petrotech	Belle Chasse, LA	(Electrical Engineer / Project Manager)
RPM Engineering	Baton Rouge, LA	(Control Systems Engineer)
ASIC, Inc.	Baton Rouge, LA	(Co-Founder / Control Systems Engineer)
Triton Controls & Engineering, Inc.	Baton Rouge, LA	(Co-Founder / Control Systems Engineer)

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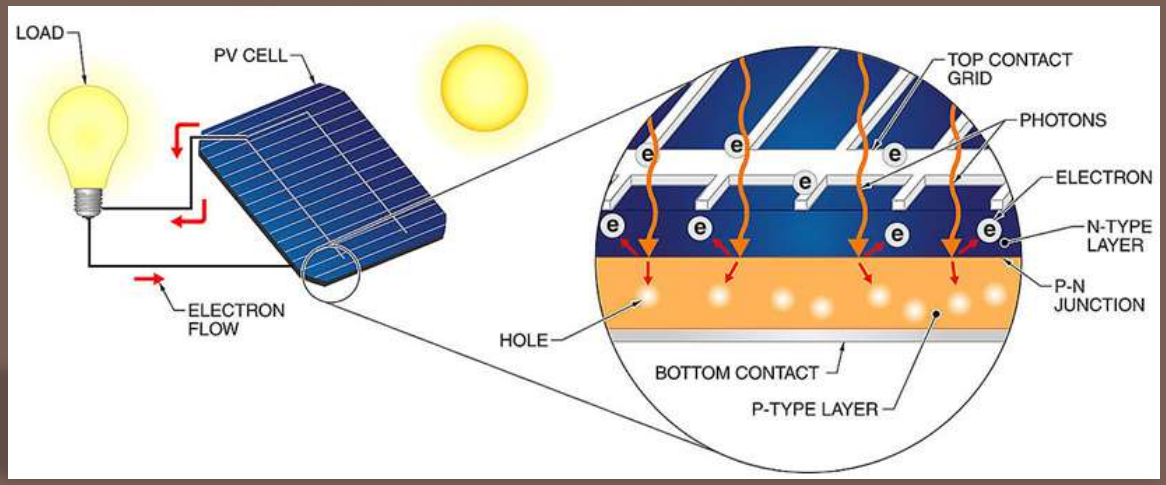
SOLAR ENERGY

How does Solar Energy Work?



The photovoltaic effect is the process by which photons of light excite electrons in a semiconductor material. The excited electrons and the remaining holes create the electrical current. This electrical current is in the form of direct current (DC).

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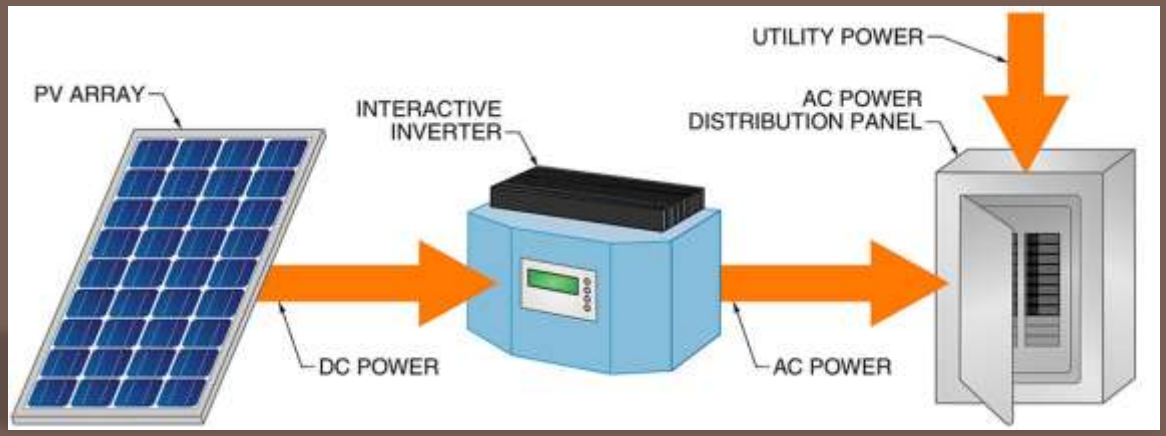
How does Solar Energy Work?



DC, however, is not useable for most common purposes so it is transformed through an inverter to alternating current (AC) at 240 volts, a common-use voltage.

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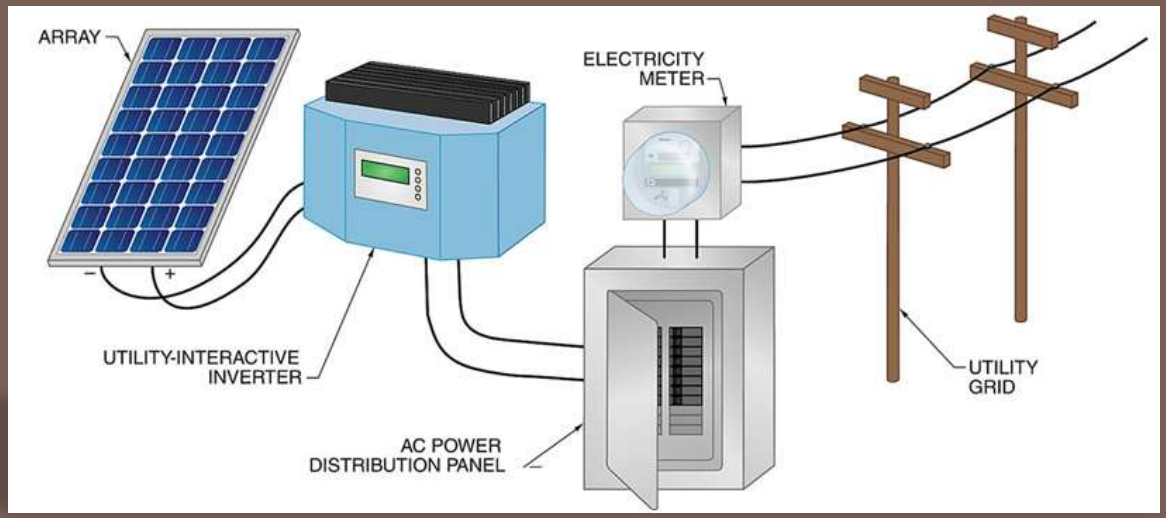
Utility Grid Tied System



Most buildings that derive energy from photovoltaic (PV) systems are also connected to the local electrical utility grid. The building electrical demands are met first by the PV system. Additional energy requirements of the building are met by the local utility grid. PV power produced in excess of the building electrical demands flows to the utility grid.

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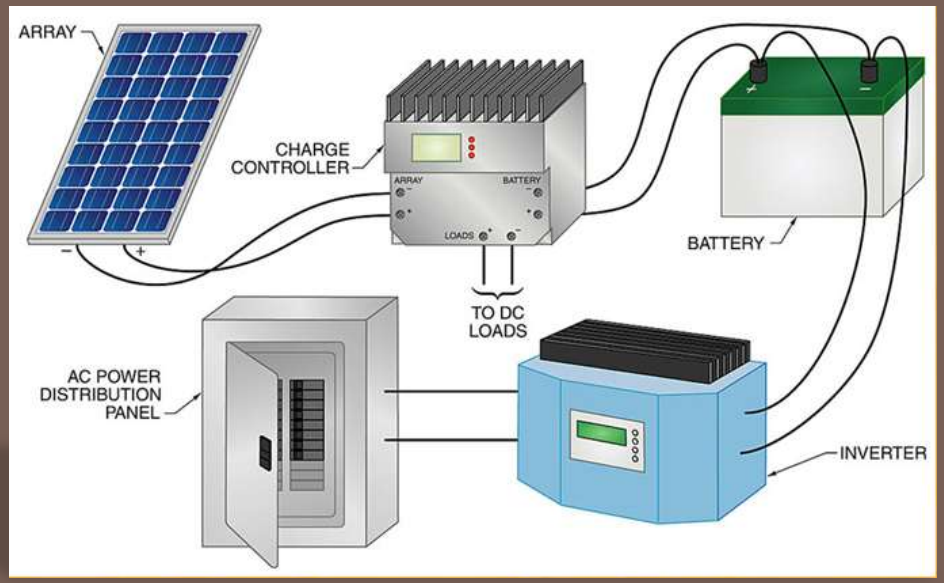
Off Grid System



Some buildings derive all of their energy from PV systems which are NOT connected to the local electrical utility grid. The PV array is sized to provide both power to the building and power to charge batteries during daylight hours. At night, the batteries furnish their stored power to the inverter for nighttime electrical consumption.

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WHY SOLAR ENERGY?

In the back of everyone's mind, is how will we supply our demand for energy into the future? I believe that we have been given milestones in technology which have opened the doors in history to greater and greater social and economic experiences. (ie the steam engine, the light bulb, the radio, the internal combustion engine, the computer) We need to be looking for the next technology and I believe that the next technology will be harvesting renewable energy.

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STATIONARY SYSTEMS

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STATIONARY INSTALLATION

Stationary PV systems are permanently fixed at a given angle of elevation and a given direction. Most times the elevation and direction are dictated by the object to which they are attached.

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SOLAR TRACKING

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APOLLO MMX

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WHY Solar Tracking?

The amount of energy that a PV panel converts from visible light to electricity depends upon many factors. One of these factors is the panel's orientation in the sun's rays. The highest electrical production occurs when the sun's rays are orthogonal to the panel face.

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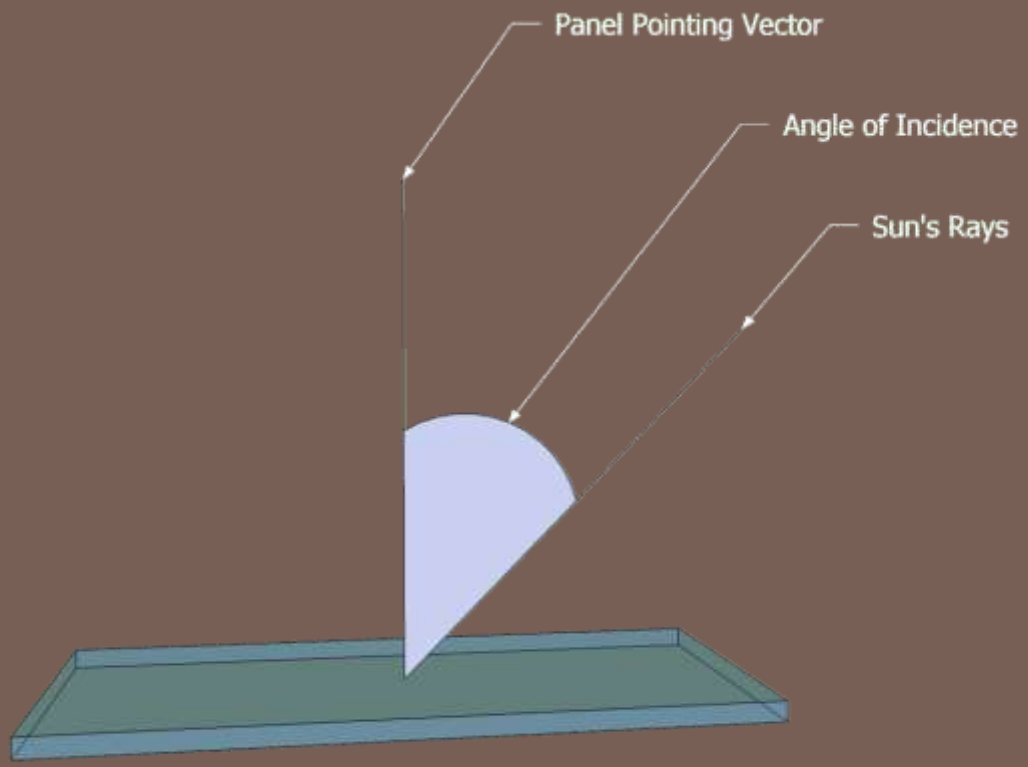
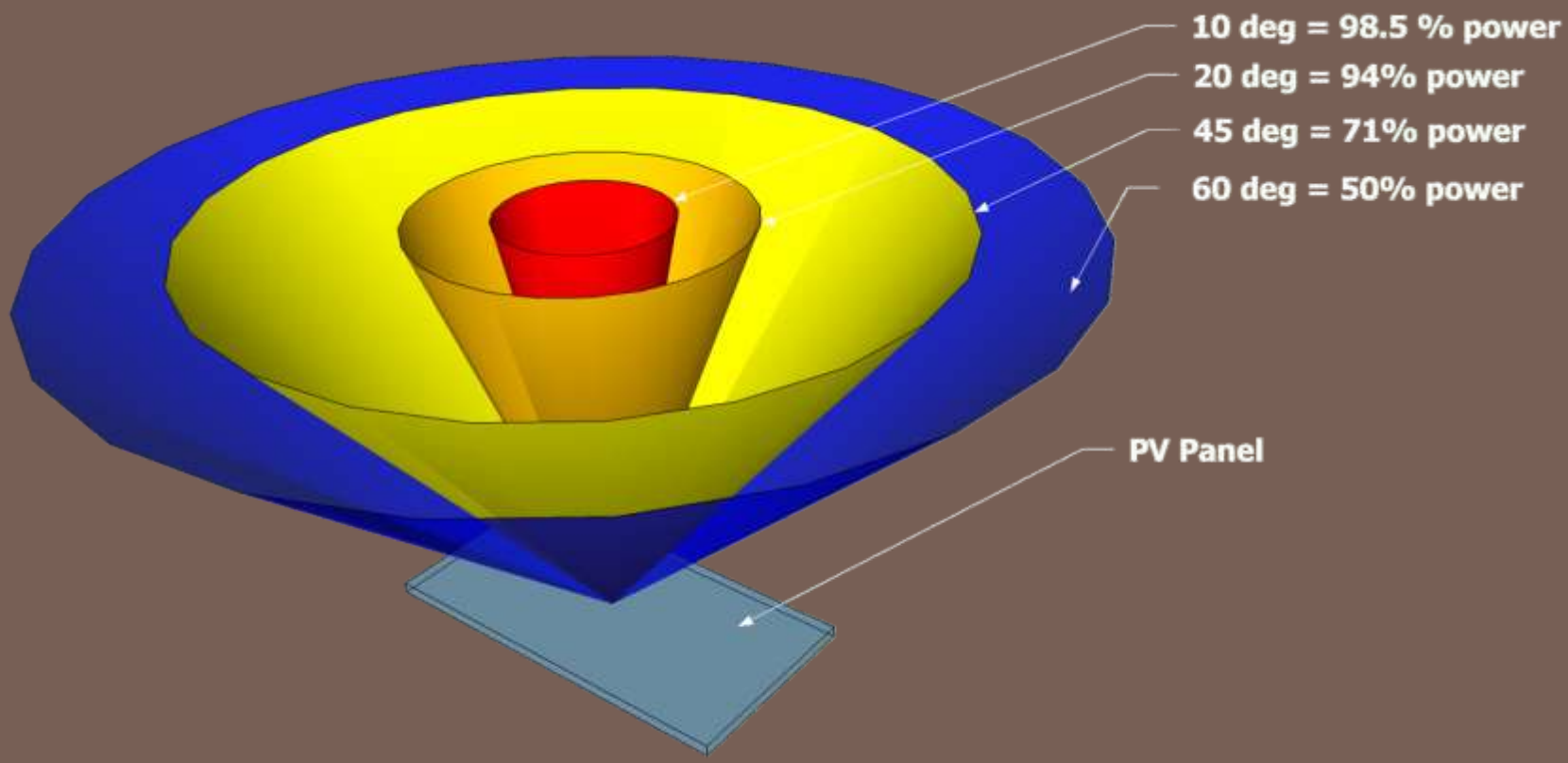
Angle of Incidence



The angle of incidence is the angle between a vector orthogonal to the panel face and the direction vector of the sun's ray striking the panel.

Power Cone



Spinning the angle of incidence in a circle creates a cone. These cones display the power available to the panel at different orientations to the sun.

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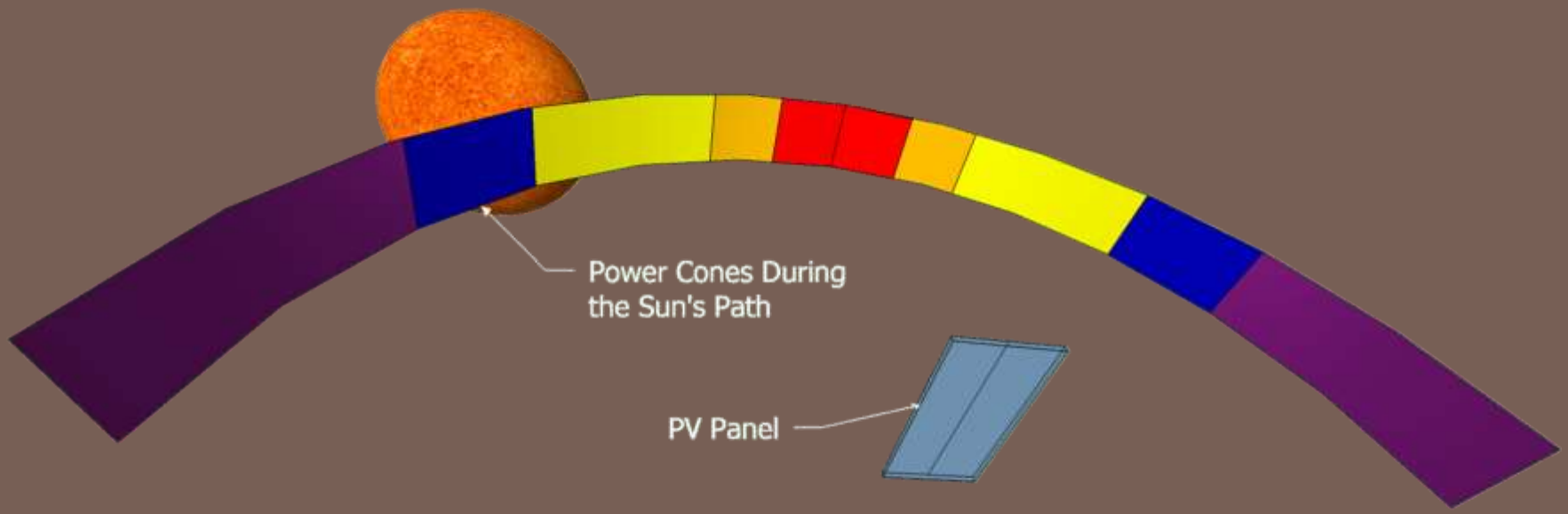
Power Cone - Stationary



For the stationary system the sun's rays spend very little time in the high power producing cones. In fact, the sun occupies regions with less than 75% available power for half of the day.

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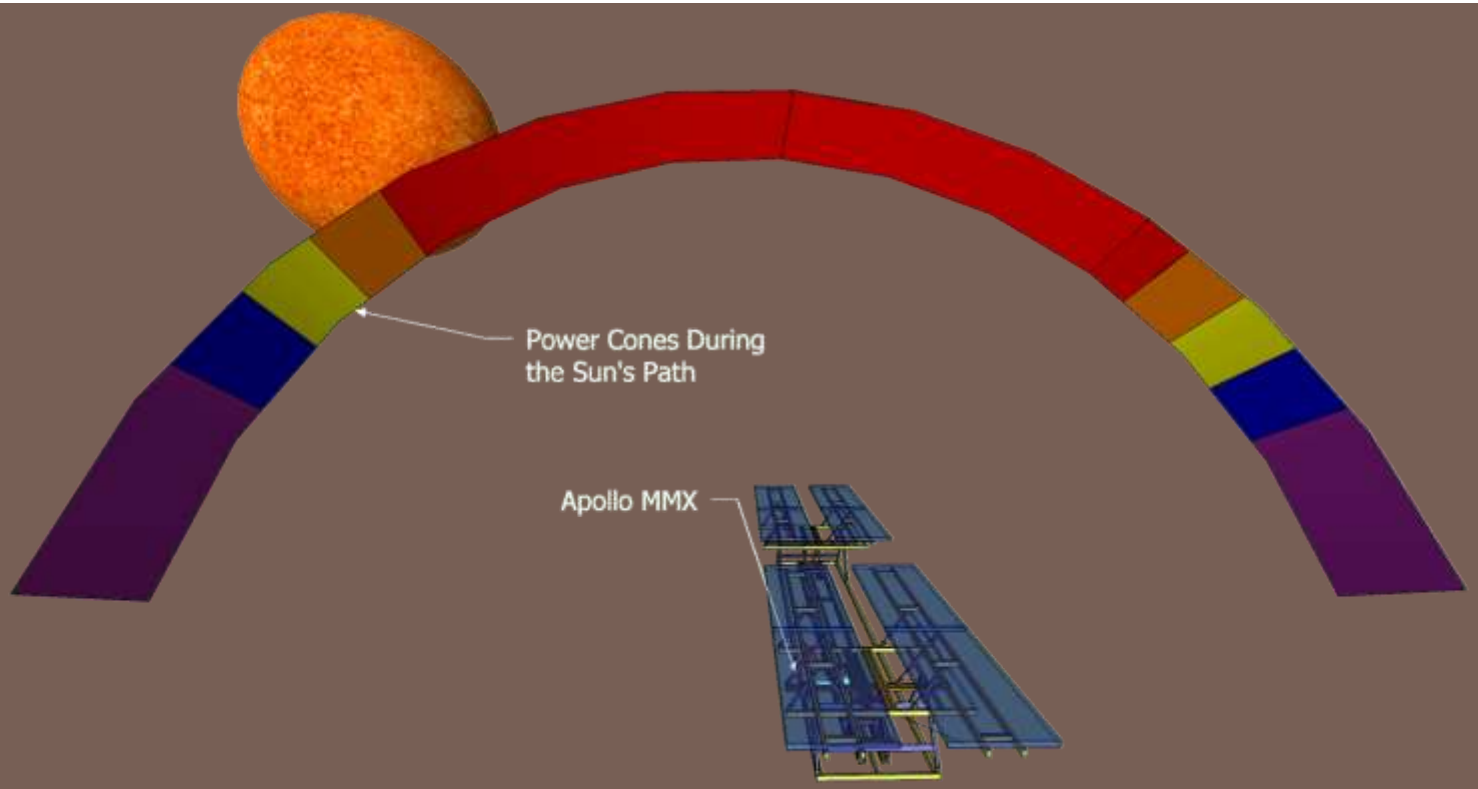
Power Cone - Tracking



In contrast, the Apollo MMX maintains the sun's rays in a power cone greater than 94% for nearly two thirds of the day.

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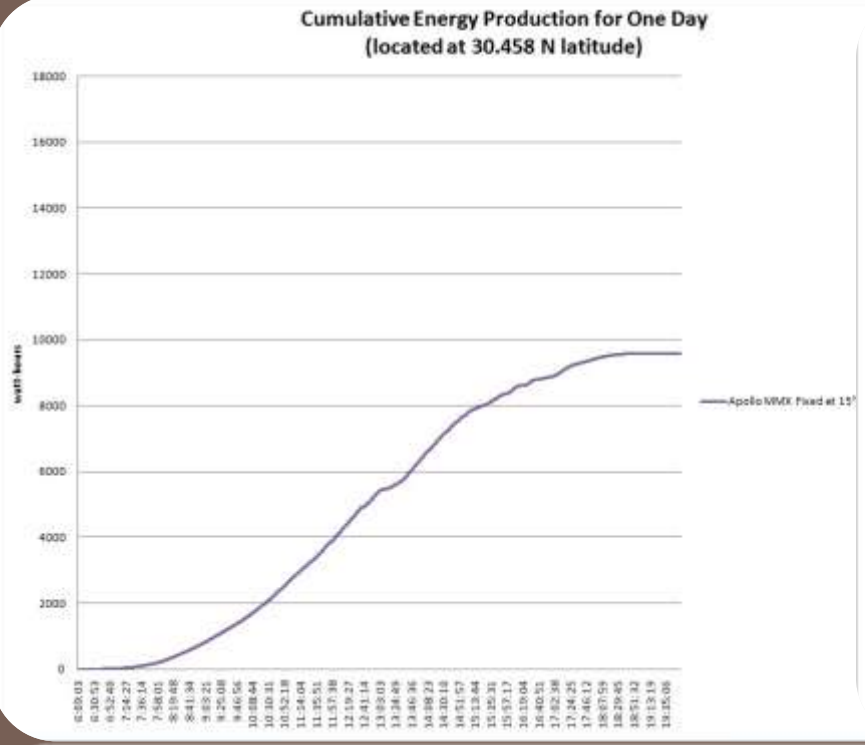
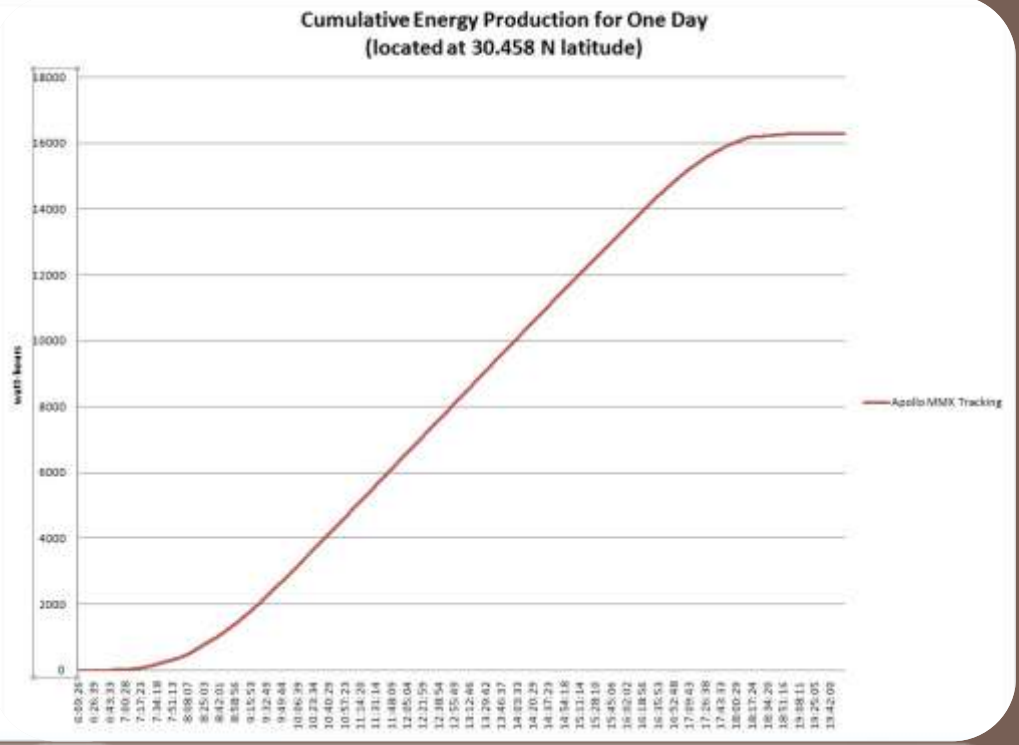
Energy Comparison

Stationary



Tracking



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APOLLO MMX

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WHAT IS IN THE PACKAGE?

APOLLO MMX (Complete System)

- Engineered System
- Apollo MMX tracking system
- Kaco Blueplanet Inverter
- Mage Solar 190w Monocrystalline Panels
- DC Disconnect Switch
- Ethernet Connection
- Web Server for Data and Configuration

STATIONARY (Purchased Separately)

- Engineering
- Aluminum Rail
- Inverter
- PV Panel Mounting Hardware
- DC Disconnect and Combiner Box
- Cable Connectors
- USE-2 Wire
- Remote Monitoring

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ECONOMICS

Reduced Engineering Costs

- Object Oriented Approach
- Encapsulated Engineering
- No “Reinventing of the Wheel”
- Only 2 Question to Answer…
  - How much power do I need?
  - How much space do I have?

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Efficiency

- Solar Tracking produces more Energy
- Low Power Consumption Actuators
- Short DC Wiring
- Low Turn-on Inverter Voltage

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Reduced Installation Obstacles

Versus Stationary Systems

- No Angled Roof Installation
- No Custom Panel Layouts
- No DC Wiring
- No Need to Locate Roof Rafters
- No Inverter Installation
- No Component Sizing

Versus Pole Mounted Trackers

- No Heavy Equipment
- No Large Pipe
- No Installing Panels a Ladder or Lift

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Return On Investment

- Rate of Return is dependent upon solar production at the installation site. Poor weather and high latitude are the major obstacles to PV power production. Rate of Return is also dependent upon the utility billing rate for electricity in the installation area. Higher avoided costs mean faster rates of return.

- Assuming that the Apollo MMX produces 60% more energy than a stationary system, it will usually have a 25% faster rate of return than a stationary system. This is based on a 21% higher installed cost for Apollo MMX compared to fixed systems.

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Federal and State Incentive

- Federal Incentive – 30% of installed cost as income tax rebate. No maximum limit. Must be a complete system.

- Louisiana State Incentive – 50% of installed cost as income tax rebate. Maximum of $25,000 per year. Must be a complete system. Must be installed at a single family residence or multifamily dwelling.

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APPLICATIONS FOR APOLLO MMX

SCHOOLS

EMERGENCY PREPAREDNESS

MILITARY

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MUNICIPAL BUILDINGS

COMMERICAL BUILDINGS

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APARTMENT COMPLEXES

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SUBDIVISIONS

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RESIDENTAL HOMES

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CAMPS, PARKS & RECREATION

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QUESTIONS