

# West Wetlands Solar Garden Information

## SOLAR ENERGY

For every kWh of electricity generated by solar energy, the following emissions are avoided since that kWh need not be generated from a fossil fuel power plant.

In one year, the approximate avoided emissions in lb/yr are:  
(Based on APS' 2003 fuel mix)

SOLAR POWER PLANT SIZE	CO <sub>2</sub>	NOX	SOX	PARTICULATES
1 kW	2,540	5.2	2.8	0.36
10 kW	25,400	52	28	3.6
100 kW	254,000	520	280	36
1 MW	2,540,000	5,200	2,800	360

APS serves the majority of the state of Arizona with electricity. The fuels used to generate electricity are coal, natural gas, and uranium (nuclear). As of 2005, APS has twelve large solar powered plants in Arizona. The first commercial solar power plant was built and dedicated in 1997 in Flagstaff, Arizona and has a power output of 82 kW.

### West Wetlands APS Solar Garden

The West Wetlands Solar Garden consists of 24 single axis tracking systems that are tilted toward the south. Each system produces approximately 3.6kW of DC electrical power, which is converted to 60HZ AC power using an inverter. The modules on each tracker are mono-crystalline silicon.

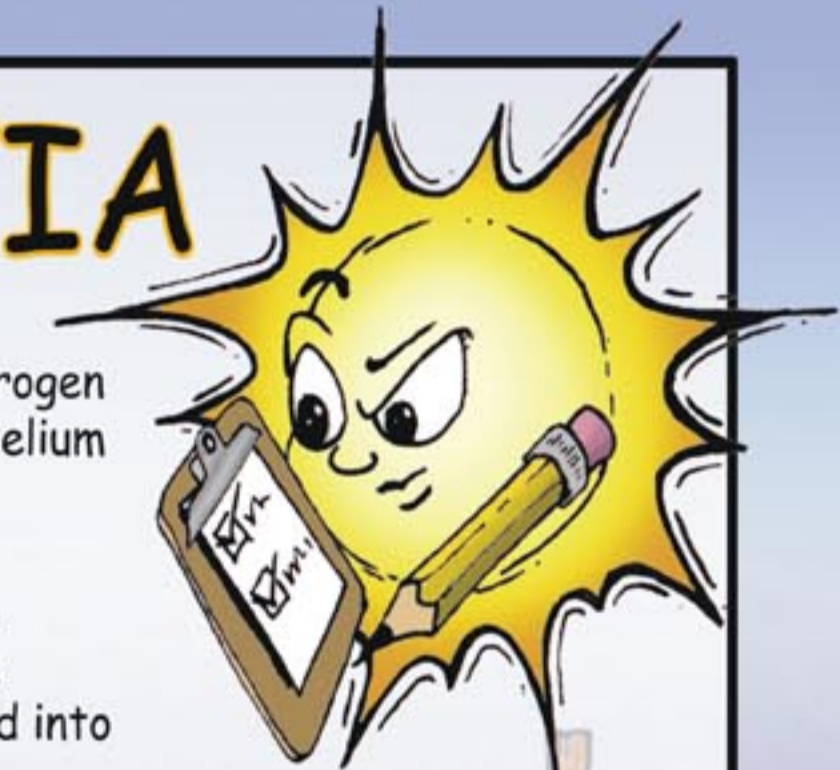
This Solar Garden will generate enough electricity to power approximately 20 homes in the Yuma area.

The trackers rotate approximately 80 degrees from the east in the morning to the west in the afternoon. The trackers rotate from 9:30 a.m. (furthest east) until 3:30 (furthest west) as solar noon in the location is around 12:30 p.m. The systems operate by using a clock, controller, and a hydraulic pump. Each APS Tilted Tracker™ moves approximately 2 degrees every 8 minutes to track the sun across the sky.

After dark, during off-peak hours, the systems utilize a very small amount of energy from the electrical grid to return the trackers to the east position. They then remain fixed until 9:30 a.m. the next day when they repeat the same cycle.

Power Output.....	86,400 watts (86.4 kW)
Number of Modules.....	288 (ASE D6300)
Number of Arrays.....	24
Number of Inverters.....	24

## SOLAR TRIVIA



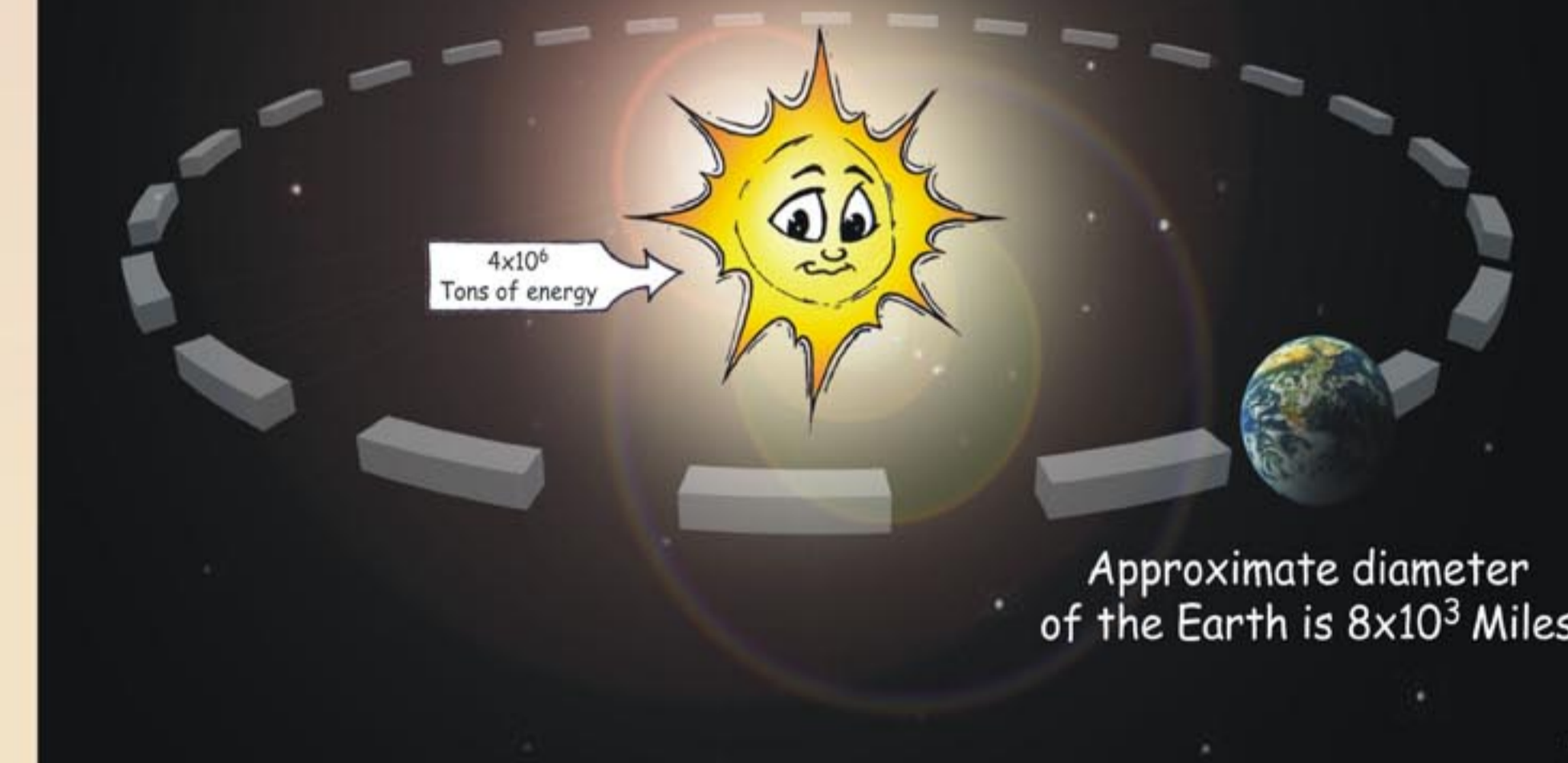
Every second 657 million tons of hydrogen are converted to 653 million tons of helium in our sun.

The missing 4 million tons of mass are converted to light and heat energy via Einstein's  $E=MC^2$  equation and radiated into space.

At an average distance of 93 million miles from the sun, the earth collects approximately 4 lbs. of this energy, which supports life on earth as we know it.

Photo Courtesy of NASA

Average distance between the Sun and the Earth is  $93 \times 10^6$  Miles



If you assume the diameter of the earth is 8000 miles and using 2240 lb/ton (British Ton), the 4 lbs. can be calculated using the following formula:

$$\frac{4 \times 10^6 \times \pi \times (8 \times 10^3)^2}{4 \times \pi \times (93 \times 10^6)^2 \times 4} = 4.14 \text{ lbs.}$$