Green States Energy

Leading the Way to a Brighter Future

Who We Are

- Green States Energy (GSE), was formed in 2010 to become a premier Independent Power Producer (IPP) of clean, renewable electricity from solar Photovoltaic (PV) facilities that it will develop
- More than 120MW of utility scale projects in development, from the Midwest through the East Coast
- More than 20MW of commercial projects in development
- We plan to develop at least 200 MW of solar PV by 2015
- Our Management Team has vast experience in energy, infrastructure, finance, and utilities businesses as well as direct experience in solar PV development

We Grow Electricity!

Green States Energy

Leading the Way to a Brighter Future

Why Solar?

- Solar PV generation enables more efficient use of physical infrastructure
- Once in service, solar requires virtually zero maintenance – no moving parts to wear out, no "feed stock" or consumables used
- Demand for solar power is strong and growing as solar produces its peak output during hot summer days, when it is needed most
- With the Gulf oil spill, the impacts on nuclear power from the recent tragedy in Japan, many coal plants coming to end of life, and continued instability in the Middle East, the need for clean domestic energy is at an all time high

Adaptable Design

Green States Energy

Leading the Way to a Brighter Future

Three Key Components

1. Project analysis & development

2. Implementation (engineering & construction)

3. Project financing

One Size Does NOT Fit All!

Each site and "operational situation" must be approached individually

1. Structural
2. Logistical
3. Electrical
4. Practical

Careful investigation and evaluation of these four elements must be performed by experienced professionals in order to determine feasibility, and then to select the proper design, which is then the basis of selecting the components and the vendors to design and install

It's All About Financing

Projects require 3 components of a complete financing solution:

1. Sponsor's equity (cash from the owner of the system)
2. Tax equity (monetization of the 30% federal tax credit
3. Debt (loan for remainder of project costs)

Key Elements to Financing:

1. Experience & track record of components
2. Experience & track record of EPC firm
3. Extreme due diligence on projected energy output and project economics

Pieces of the Puzzle

- Utility Agreements (interconnection, net metering, PPA, other off-takes)
- Local / state / federal permitting and approvals
- Insurance
- Warranty issues (roof, HVAC, solar, other)
- Safety, Safety, Safety, Safety, Safety, Safety, Safety, Safety

A developer such as Green States Energy can handle all of the heavy lifting, leaving you to focus on your core business, while making the best decisions to maximize the value of your infrastructure

Green States Energy

Leading the Way to a Brighter Future

Summary

- **WHY** – Maximize the use and value of your infrastructure
- **WHY ELSE** – Improved survivability & economic benefits
- **WHEN** – Start now
- **HOW** – Take all elements into account and let experienced pros guide you to a successful decision and outcome
- **WHO** – An experienced professional who can choose from the full array of design options, and who can finance the project (unless you don't need the $$)
- Safety, Safety, Safety, Safety, Safety, Safety, Safety, Safety

Large & Growing Market

- Solar installations in 2010 are up more than 100% over 2009
- Renewables accounted for over half of newly installed power capacity in 2009
- The U.S. Solar Market Insight report baseline forecast projects that 944 MW of solar electric will be installed in the U.S. in 2010- growth of 114% over 2009
- All of those installations have led to job growth. As of August 2010, the National Solar Jobs Census identified 16,700 solar employment sites and 93,000 solar jobs in all 50 states
- Solar employers expect to increase the number of workers by 26%, representing nearly 24,000 net new jobs by August 2011. This rate is significantly higher than the expected 3% net job loss in fossil fuel power generation and the economy-wide expectation of 2% growth over the same period, according to the solar foundation

This important report demonstrates that the solar industry is a true area of growth for our economy - creating jobs across the country while helping to transition our nation to renewable, secure, domestic sources of energy

Green States Energy

Leading the Way to a Brighter Future

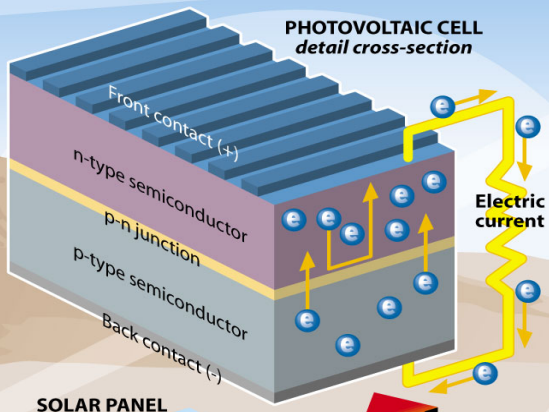
Tapping the Sun's Energy

Solar panels, or photovoltaic cells, harness energy from the sun. The cells are made of a semiconductive material that is specially treated so that the sun's rays help create a flow of electrons, which can be used to power your home.

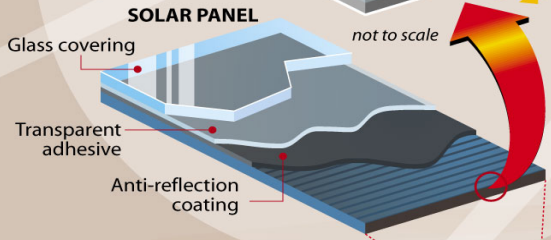
The sun gives off about 400 trillion trillion watts of power

A lot of the sun's energy is reflected back into space or absorbed by the Earth's atmosphere. An average of 1,000 watts hits each square meter of the Earth's surface during peak times, more energy per hour than the global population uses in a year.

PHOTOVOLTAIC CELL
detail cross-section



SOLAR PANEL



PV cell at a glance

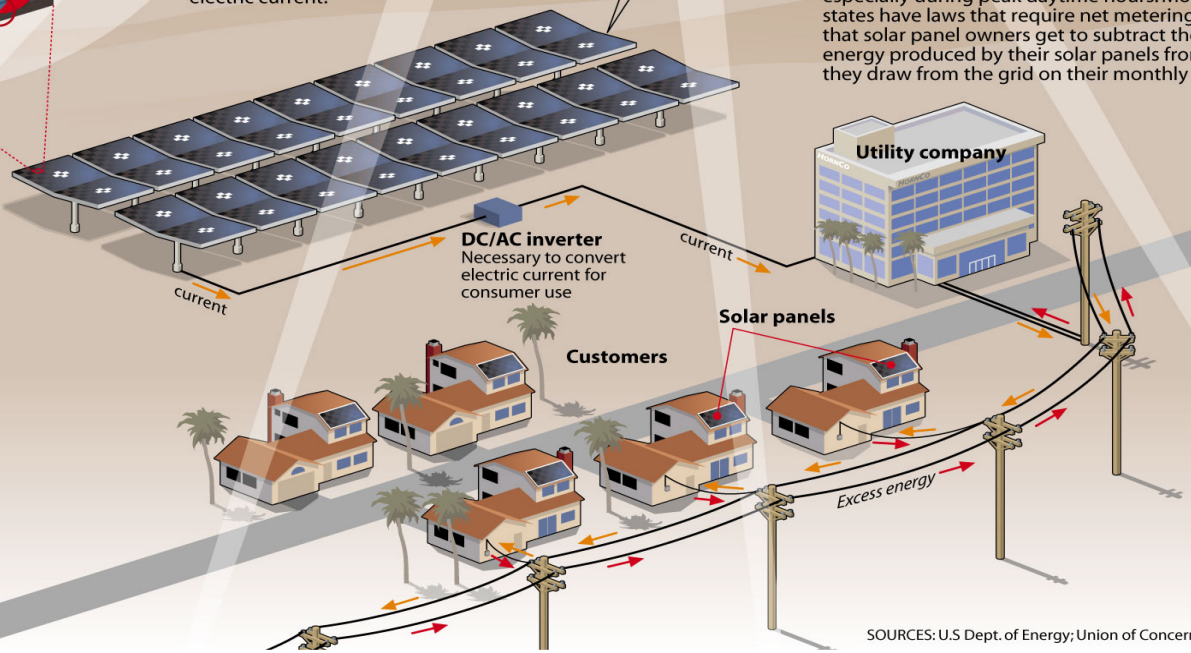
A photovoltaic (or PV) cell is a specially treated wafer of silicon, sandwiched between two thin contact plates. The top contact is positively charged and the back contact is negatively charged, making it a semiconductor.

- The **n-type semiconductor** has an abundance of electrons, giving it a negative charge, while the **p-type semiconductor** is positively charged.
- Electron movement at the **p-n junction** produces an electric field that allows only electrons to flow from the p-type layer to the n-type layer.
- When sunlight hits the solar cell, its energy knocks electrons loose from the atoms in the semiconductor.
- When the electrons hit the electrical field, they're shuttled to the top contact plate and become a usuable electric current.

Solar panel farm
How much energy a solar panel can make depends on how efficiently it converts the sun's energy. An average solar panel around a square meter in size can generate about 100 watts. Commercial panels are up to 17% efficient, and are getting better every day.

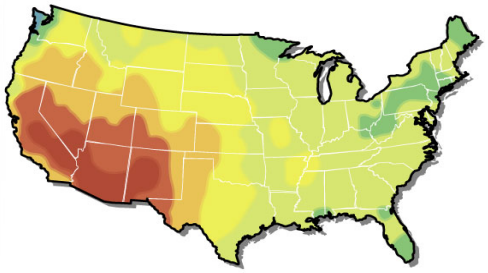
Feeding the grid

Excess energy from the solar array is fed into the power grid. It helps provide extra electricity to the community, especially during peak daytime hours. More than 35 U.S. states have laws that require net metering, which means that solar panel owners get to subtract the amount of energy produced by their solar panels from the energy they draw from the grid on their monthly bill.



Solar potential in the U.S.

The amount of energy striking almost any part of the Earth is vast, regardless of region, season, time of day, climate and air pollution. Shown is the average radiation received on a horizontal surface across the continental United States in the month of June.



SOURCES: U.S Dept. of Energy; Union of Concerned Scientists; NOVA; NASA