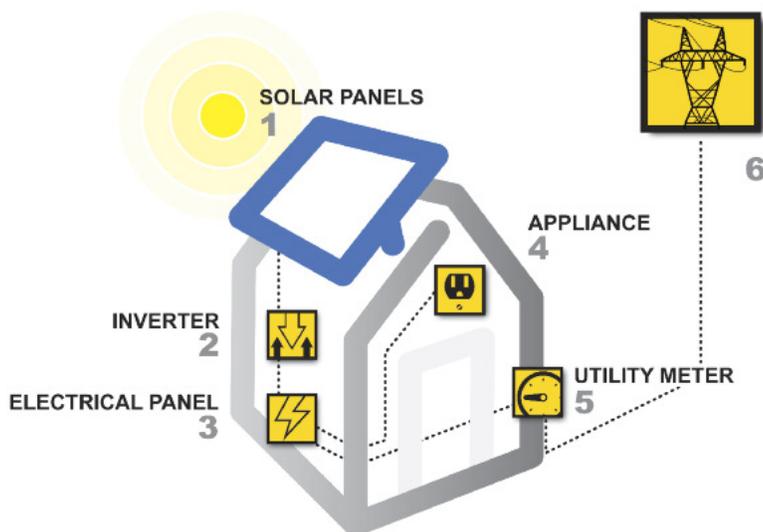


# The Science of Solar: Solar Energy – On-Grid Systems

*Solar Discovery Series*

In Solar Energy – The Basics, we learned about how sunlight is converted into electricity using solar cells, which make up modules and arrays. Harnessing the power of photons and electrons to produce electricity is an amazing thing. Using the sun to do it provides a sustainable and reliable source of energy for both residential and commercial buildings. If the sun were to fail, the earth would cease to exist as we know it.

This is a simplified explanation of the process, and it sounds like a great idea. Could you save money by installing solar panels and generating solar power where you live? Could you avoid putting tons of CO<sub>2</sub> into the environment by using a “clean” energy source like the sun? Visit: [www.findsolar.com/index.php?page=rightforme](http://www.findsolar.com/index.php?page=rightforme).



During time when excess electricity flows to the grid, the utility meter will run backward, giving the homeowner credit for contributing electricity to the grid. Note that electricity produced from solar is not stored anywhere along the line.

## BUT HOW DOES SOLAR POWER WORK IN A RESIDENTIAL HOME?

- 1 The solar panels on the roof convert the sun's energy into direct current (DC) electricity.
- 2 The current flows to an inverter, which converts the DC into alternating current (AC).
- 3 Where it is diverted to power...
  - 4 ...an appliance, for example a lamp, or sent to...
  - 5 ...the utility meter, which feeds it to...
  - 6 ...the general electricity grid to which the home is attached.

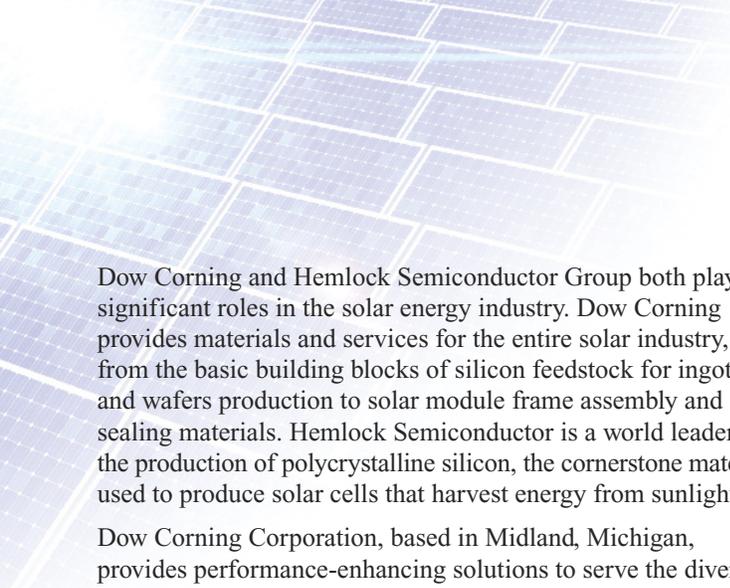
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Employees at Dow Corning's Wiesbaden site in Germany have the opportunity to see solar panels in action every day. More than 1,000 square meters of solar panels were installed on the roof and façades of office and production buildings.

The energy generated by the solar panels is fed back into the local electricity grid. In return, the company benefits from subsidies to buy electricity for its own energy needs. Dow Corning Wiesbaden commits to reinvest 30 percent of these subsidies every year in sustainable energy projects aiming to reduce the site's total energy consumption.

The solar panel modules were supplied by Photowatt International SAS, one of the largest manufacturers of solar silicon ingots, wafers, cells and modules in Europe. They contain *Dow Corning*<sup>®</sup> brand materials developed for use in photovoltaic cells and modules.



Dow Corning and Hemlock Semiconductor Group both play significant roles in the solar energy industry. Dow Corning provides materials and services for the entire solar industry, from the basic building blocks of silicon feedstock for ingots and wafers production to solar module frame assembly and sealing materials. Hemlock Semiconductor is a world leader in the production of polycrystalline silicon, the cornerstone material used to produce solar cells that harvest energy from sunlight.

Dow Corning Corporation, based in Midland, Michigan, provides performance-enhancing solutions to serve the diverse needs of more than 25,000 customers worldwide. A global leader in silicon-based technology and innovation, offering more than 7,000 products and services, Dow Corning is equally owned by The Dow Chemical Company and Corning, Incorporated. More than half of Dow Corning's annual sales are outside the United States.

Hemlock Semiconductor Group is a world leader in the production of polycrystalline silicon and other silicon-based products used in the manufacturing of semiconductor devices and passive solar cells and modules. Headquartered in Hemlock, Michigan, Hemlock Semiconductor is owned in majority by Dow Corning Corporation. For more information, please visit [hsepoly.com](http://hsepoly.com).

## LEARN MORE

Dow Corning has sales offices and manufacturing sites, as well as science and technology laboratories, around the globe. For more information, please visit [dowcorning.com/solar](http://dowcorning.com/solar) or e-mail [solar.solutions@dowcorning.com](mailto:solar.solutions@dowcorning.com).

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