

♥ SUN SYSTEMS

Photovoltaics

FIRST-GENERATION SOLAR

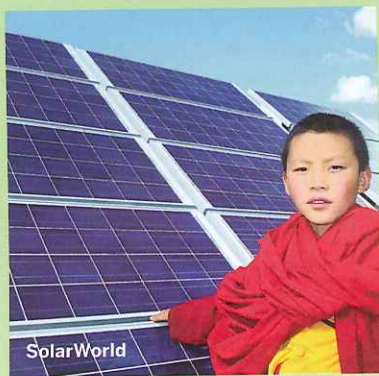
First-generation photovoltaics, such as crystalline silicon solar panels, can be integrated into a project during construction or retrofitted. See:

General Electric www.gepower.com
SunWize www.sunwize.com
ReadySolar www.readysolar.com
Solar Integrated www.solarintegrated.com
Atlantis Energy Systems
www.atlantisenenergy.org
SolarWorld www.solarworld-usa.com
Prism Solar Technologies
www.prismsolar.com

SECOND-GENERATION SOLAR

Innovative thin-film solar cells represent the second generation of photovoltaics. They have a lower efficiency rate than crystalline cells but are less costly to produce and more flexible, resulting in new applications. See:

United Solar Ovonic www.uni-solar.com
Power Film www.powerfilmsolar.com
XsunX www.xsunx.com



THIRD-GENERATION SOLAR

Though still in the development stage, third-generation photovoltaics aim to make thin-film technology more efficient. Konarka www.konarka.com, for example, offers organic photovoltaics, which collect energy from both artificial sources and the sun. They can be placed on glass or integrated into a window. Dyesol www.dyesol.com offers dye-sensitized solar cells, new low-cost thin-film cells that work as "light sponges," like chlorophyll.

Pre-assembled residential systems make the switch to solar easy. Sharp's sleek OnEnergy system www.sharponenergy.com is made to order for installation on almost any roof. Kyocera's MyGen grid-tie system www.kyocerasolar.com is for residential and small commercial buildings. BP's Solar Home Solution systems www.bp.com are available – from initial consultation to installation – through Home Depot (U.S.).

Solar tracking shades

Solar tracking shades react to changes in the sun and the weather, optimizing the flow of heat and light into a building and reducing the need for artificial lighting, thereby lessening heating and cooling loads. Some also take advantage of expansive facades to harvest solar energy. See:

Colt International
www.shadinglouvres.com
Kawneer www.kawneer.com
LightLouver
www.lightlouver.com
MechoShade
www.mechoshade.com

DID YOU KNOW?

The sun provides enough energy in an hour to power all the world's homes for an entire year.

Solar hot water

Solar water heaters feature rooftop or underground piping systems that gather solar heat. The water that runs through the pipes is heated for pool or indoor use. See:

Butler Sun Solutions
www.butlersunsolutions.com
Solahart www.solahart.com.au
SolarRoofs www.solarroofs.com
Dawn Solar www.dawnsolar.com
Solargenix Energy
www.solargenixchicago.com
Taylor Munro Energy Systems
www.taylormunro.com
Sunda www.sundasolar.com
Thermo Dynamics
www.thermo-dynamics.com
Heliodyne www.heliodyne.com
Sun Systems www.sunsystemsinc.com

♥ WATER SYSTEMS

Rainwater harvesting

The Garden Watersaver kit includes a hose that attaches to a gutter downspout and diverts rainwater to a collection barrel. The two-metre hose reaches well away from the house to where the barrel is concealed. www.gardenwatersaver.com

RainMan Waterworks designs and installs rain-harvesting systems for a variety of applications, including residential, commercial and municipal projects. The Austin and San Antonio company also offers system components like custom-built storage tanks. www.rainharvester.com

Resource Conservation Technology offers low-maintenance systems that redirect all of a building's downspouts to underground tanks outfitted with pumps and control and disinfection systems. Some of its equipment is capable of cleaning water for use in showers and for drinking. www.conservatontechnology.com

Grey water systems

Water wasted while rinsing vegetables or waiting for hot water can be captured with EnviroSink's basin. It sits beside the regular kitchen sink and drains into a grey water storage tank in the backyard for watering gardens or flushing toilets. www.envirosink.com



Designed by Canadian architects Moss Sund and design firm Figforty, Cista is an alternative to the rain barrel. The storage unit captures water flowing from eavestroughs. Concealed by a covering of green foliage, the vertical 378-litre tank employs an LED to indicate the water level. Moss Sund hopes to see Cista on the North American market by spring 2010. www.mosssund.com

A GARDEN PLUS A GREY WATER SYSTEM

The Recirculating Wastewater Garden is a two-in-one garden and irrigation system developed by Massachusetts firm Sustainable Strategies. It reuses a building's waste water and grey water to irrigate an engineered garden of willows, bamboo and vines. Extra water is purified by the micro-ecosystem in the plants' roots and collected on the surface. www.ecological-engineering.com

Equaris's biological waste water treatment systems are designed for areas that lack piped sewage systems. Grey water flows through a series of filtration tanks that house special aerobic bacteria that clean the water through natural biological processes. www.equaris.com

Brac Systems' water recycling tanks collect and filter shower, bath and laundry water and reuse it to flush toilets. www.bracsystems.com

Intended for warmer climates, the ReWater irrigation system cleans and redirects half of the water used in a home – including from showers, sinks and washing machines – and uses it in a below- or above-ground drip irrigation system for watering lawns and gardens. www.rewater.com

Water heat exchange

Water heat exchangers capture the thermal energy from hot water headed down the drain and from air conditioning units, then use it to reduce the water heater's workload.

GFX www.gfxtechnology.com
Florida Heat Pump www.fhp-mfg.com
Trevor-Martin Corporation
www.trevormartin.com
Doucette www.doucetteindustries.com
Watercycles www.watercycles.ca



♥ COMPOSTING TOILETS

Composting toilets save water, cut down on potentially pathogenic materials entering the environment, and provide valuable fertilizer for practical use. These waterless, odourless toilets are as easy to use as traditional models.

The Phoenix toilet by Montana's Advanced Composting Systems features an exhaust fan that uses just five watts of energy, making it perfect for off-the-grid buildings. Its shaft is cranked weekly to mix the compost. www.compostingtoilet.com

Ohio-based BioLet's line of waterless, self-contained toilets – available through Home Depot – includes the BioLet 60 XL, a fully automated toilet with thermostat, fan, liquid controls and a mixer that operates each time the seat is lowered. www.biolet.com

Bio-Sun Systems composting tanks can serve multiple toilets and convert kitchen waste as well. The system draws oxygen down with the waste, while a vent extraction device circulates air and removes gases. www.best-composting-toilet.com



Mulltoa

Swedish manufacturer Mulltoa's line of streamlined waterless composting toilets includes fully automated electric models. Electricity consumption is controlled by adjusting a thermostat that can be set to the number of people using the toilet. Some models also feature a sensor that turns on a heater when it detects excess liquid. www.mulltoa.com

MORE OPTIONS

Clivus Multrum
www.clivusmultrum.com
Sun-Mar www.sun-mar.com
Envirolet www.envirolet.com

GREEN GLOSSARY: LEED – The Leadership in Energy and Environmental Design program evaluates projects in a series of categories, and awards points for such features as water use reduction, ozone preservation and optimum ventilation. Qualifying projects can achieve certified, silver, gold or platinum status.