

# CORNELL SOLAR PHOTOVOLTAIC PROJECTS

Thanks to the generous donations of alumni and friends of Cornell and the local electricians union apprentice classes, two solar photovoltaic electric systems are nearing completion. These systems are the latest renewable energy on campus, and help highlight Cornell's interest in furthering its use.

## Highlights of the projects

What we built: 15 kilowatts peak output on the roof of Day Hall and 2.2 kilowatts peak output on the south wall of the Cornell Store. The two systems will make more than enough combined electricity to power the McGraw Clock Tower lighting each year (12,000 kilowatt-hours).

The Day Hall panels are roof mounted on ballasted frames, and will provide less than 2% of the building's energy use. The panels at the Cornell Store are mounted on the south wall and will provide less than .2% of the Store's needs. Both systems will have web accessible data, available for the faculty to use for teaching, research, and outreach.

**What started the project?** In 2004, graduating senior Abigail Krich donated the founding gift of the Krich Family Solar Fund. Since that time, fund raising efforts by the KyotoNOW! student group has helped add to that fund. In 2006, alum and trustee Richard Aubrecht donated used panels and the local electricians union agreed to provide donated labor. Shortly thereafter, the administration approved the planned installations with the balance of funding provided by the university. The donations reduced project costs by nearly two-thirds.

**How does solar photovoltaic energy work?** Sunlight is made of many wavelengths of radiant energy. That energy falls on the panels and is converted by the crystalline silicon structure into direct current electrical energy. About 15% of the energy hitting the panels is converted to electricity, the rest is reflected or becomes heat. The panels are connected through copper wire to inverters that change the direct current power into alternating current at the correct voltage and frequency for use in the building. On an annual basis, the panels generate on average about 10% of their peak rating.

**Will Cornell have more solar power?** Large quantities are not likely without generous help from our friends. Solar photovoltaic generated electricity is still about ten times the cost of conventional power. As a result, there are many state and federal rebates and tax incentives to encourage its use. Over time as the cost and efficiency of new solar panels and systems improves, its use will grow.



The Day Hall system powers the McGraw Clock Tower



## Renewable Energy at Cornell

### The Hydroplant

Ezra Cornell created our hydroplant on Fall Creek under the Suspension Bridge circa 1900. At that time it powered the entire campus and nearby areas. In 1981 the plant was rebuilt to its current configuration and today makes 2% of campus electric needs (5 million kWhr/yr). A renewal project completed in 2008 increased its output by 20%.

### Lake Source Cooling

In 2000, Cornell began operation of the award winning Lake Source Cooling project, reducing electricity use for central cooling by **86%** (25 million kWhr/yr). The system cools campus buildings without refrigeration, utilizing the renewable cold provided by the deep waters of nearby Cayuga Lake. Deep water cooling is now in use in Toronto and is planned for Hawaii.



The Cornell Store 2.2 kilowatt system

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