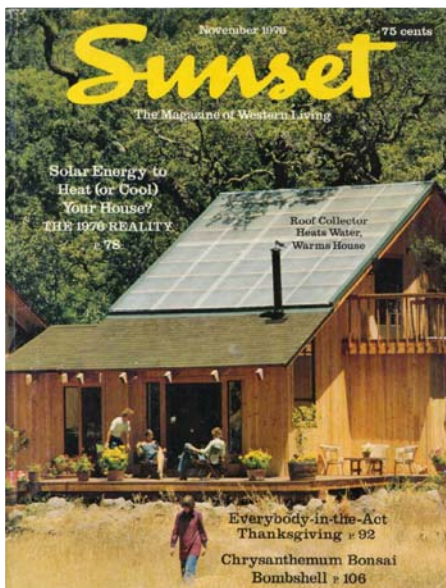


Interactive Resources and Solar Energy – A Return to Our Roots

When Interactive Resources formed in 1973, the energy crisis resulting from the Middle East oil embargo was already in full swing. Responding to widespread panic characterized by long lines at service stations and rapidly rising energy prices, Interactive Resources quickly gained a reputation for energy-efficient design and alternative energy applications.



Above, 6 kW wind generator erected by Interactive Resources in Point Richmond was first in California to cogenerate. It was extensively instrumented and monitored by PG&E. Below, home using solar water and space heating featured on cover of *Sunset Magazine*



The firm erected the first (and at the time, also the largest) wind generator to feed power into an electrical grid in California. Fully instrumented by PG&E, it became a research project that paved the way for commercial wind power in California. Some of the first "solar" homes in California were designed by Interactive Resources. In 1975, Interactive Resources organized and implemented the first statewide California Solar Energy for Buildings Conference, repeated in 1976 and 1977 with hundreds of building industry professionals attending.

Until well into the 1980's Interactive Resources remained a leading consultant in alternative energy applications and energy conservation in building, designing hundreds of projects incorporating passive and active solar heating and cooling, including six U.S. Government-sponsored grants for research or demonstration projects in solar energy, including the AIA Research Corporation Grant (sponsored by HUD) for Phase II Development of Energy Performance Standards for New Builders, 1978, and the Willow Park II Community Center Case Study, a DOE Research Project, 1983

Interactive Resources' work in California in the 1970's and early 1980's influenced subsequent state energy conservation legislation and sped the incorporation of energy conservation considerations into the mainstream of California architectural practice. In the early 1980's, the tax incentives and high energy costs that had made solar energy applications and energy efficient design a strong market began to fade. Energy efficient design was no longer a pioneering specialty; it had been institutionalized into building codes.



In the early 1980's, Interactive Resources experimented with high temperature solar-thermal applications with this project at Lawrence Berkeley Laboratory that used solar heated water to drive absorption chillers used for air conditioning.



Interactive Resources designed an earth sheltered entry for the cave complex at Stag's Leap Wine Cellars.



The Contra Costa college Student Services Center used a number of energy efficient design strategies, including underfloor HVAC air distribution, sunshades, light shelves for daylighting, and a cool roof

In the 1970s Interactive Resources co-founded Sun Light & Power, a Berkeley contractor that has become a principal player in the photovoltaic market. Although there is no longer any connection between Interactive Resources and Sun Light & Power, we are proud to have helped spawn one of the oldest solar contractors in the United States.

In 2007, Interactive Resources is fully engaged in the photovoltaic field. Most photovoltaic arrays are rooftop mounted, often on existing roofs. Typically, the permitting authority having jurisdiction requires structural calculations indicating that the existing structure is adequate to resist gravity, wind and seismic loads resulting from the installation of PV arrays, including connections to the existing structure. A related challenge is providing a mounting strategy that provides adequate structural attachment

without penetrating the roof membrane or providing a penetration design that will preserve the integrity of the roof membrane.

Interactive Resources has provided structural engineering services for dozens of large and small projects, totaling over 5 megawatts, mainly in New Jersey and California because that is where economic incentives are generating the most interest. Solutions for attachment include adhesives, anchors and steel cables tied back to parapets.

Some of our largest projects include:

- 1.6 megawatts at the main Google headquarters in Mountain View, California. This project includes solar array designs for three different types of rooftops and two different steel carports. Blue Oak Energy (BOE) was the project architect and overall engineering designer, and E.I Solutions and partnered with two structural engineering firms to provide a comprehensive design solution. Mounting systems were provided by SunLink. Annual savings are estimated at \$393,000, and CO2 emissions are reduced by 3.6 million pounds/year (equivalent to 4.28 million car miles/year)



Google Campus, Mountain View, CA. 1.6 megawatt Photovoltaic array



Estee Lauder Aramis Facility, Oakland, NJ. 600 KW solar photovoltaic array

- 600 kilowatts at the Estee Lauder Companies, Inc. Aramis Facility in Oakland, NJ. Designed and installed by DT Solar and owned by an investment partnership created by MMA Renewable Ventures, the new solar energy system incorporates more than 3,000 SolarWorld panels installed atop a facility that houses manufacturing for Estée Lauder's Aramis Brand. The decision to implement this project is part of the Estée Lauder Companies' ongoing commitment to protect the environment, as stated in the Company's corporate Global Environmental Policy. The newly completed photovoltaic system generates energy for



Estée Lauder's manufacturing operations and helps contribute to a healthier environment. Located in Oakland, New Jersey, the project marks one of New Jersey's largest rooftop mounted solar installations as well the largest third-party solar

energy supply contract in the state. The solar energy system will offset production of more than 10,000 tons of carbon dioxide over its expected 25-year lifetime, the equivalent of approximately 34,000 barrels of oil being replaced by clean energy from the sun. The company is further blazing trails by enacting its clean energy commitment via a PPA, an innovative third party ownership model that is capable of shifting solar energy from a relatively niche market to routine corporate practice," says Ted Turner, owner of DT Solar. "As a premier developer partner to financial organizations like MMA Renewable Ventures, DT Solar is well-positioned to deliver on that market promise nationwide." MMA Renewable Ventures provided turnkey financing for the project. Dedicated to delivering financial solutions that make clean energy cost-competitive, MMA Renewable Ventures now owns and operates the New Jersey system and sells the electricity generated to Estée Lauder under a long-term Power Purchase Agreement (PPA).

"The third party PPA model makes good business sense for forward-thinking organizations like Estée Lauder that are dedicated to promoting environmental stewardship," said Matt Cheney, CEO of MMA Renewable Ventures. "The Aramis plant will benefit from predictably-priced electricity supply without the need for Estée Lauder to commit upfront capital for the equipment and installation. We are proud to have worked with DT Solar to make one of New Jersey's largest solar energy systems a cost-effective one."

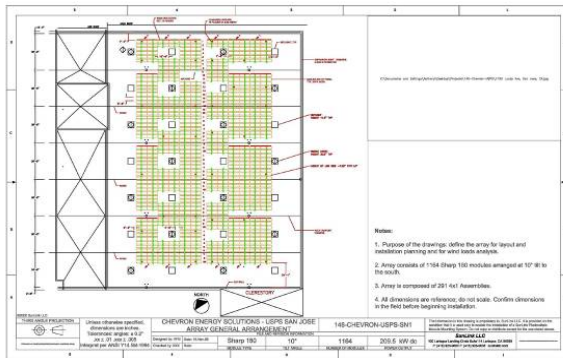


- 500 kW at Macy's East Brunswick, NJ. Macy's received a \$1.8 million rebate for the State of New Jersey. 2,940 Panels were manufactured and installed by [BP Solar](#) and use [SunLink](#) mounting hardware.

Macy's Upper Roof Looking North



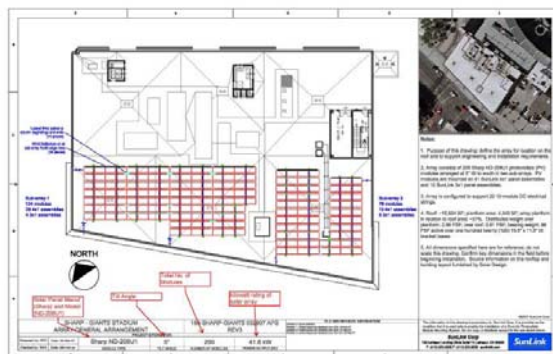
Typical 63 kW system on a Walgreens Drug Store



57 kW at Sonoma State University Student Center



USPS Facility in San Jose, CA



42 kW using 200 Sharp modules at AT&T Park, San Francisco, CA

- 567 kW at seven Walgreen's stores in New Jersey and California. The installations used 3,240 SolarWorld panels using SunLink mounting hardware.
- 57 kW at Sonoma State University Student Center, Rohnert Park, CA. 348 panels manufactured by SolarWorld were installed by Chevron Energy Solutions using SunLink mounting hardware.
- 209 kW at United States Postal Service Facility, 1790 Lundy, San Jose, CA. The system uses 180 Sharp panels and was installed by Chevron Energy Solutions.
- 68 kW at Food Bank of Solano and Contra Costa Counties, Concord, CA. The system uses 360 panels.
- 42 kW using 200 Sharp modules at AT&T Park, San Francisco, CA.



Above, Food Bank of Solano and Contra Costa Counties, Concord , CA. Below, Tony's Fine Foods



- One of the largest new projects is A 496 Kw array on the San Francisco International Airport Terminal T-3 that uses 2,832 Sun Tech modules covering 48,978 square feet. The contractor is Bass Electric, and the mounting hardware is by SunLink.

- 853 kW at Tony's Fine Foods in West Sacramento, CA using 4,102 Sharp Modules and SunLink hardware.

In the design and installation of photovoltaic systems, Interactive Resources has worked with a number of contractors and integrators, including Solar Craft, Sun Edison, Blue Oak Energy, Borrego, Solar Development, Inc., Chevron Energy Solutions, Perpetual Power, SolarCraft, GenSelf, Bleyco Incorporated and Bass Electric. Module manufacturers include Kyocera, Sharp, BP Solar, SolarWorld, SunPower and Sun Tech.