



# The Moscone Convention Center

## San Francisco combines Solar & Energy Efficiency

<b>LOCATION:</b>	San Francisco, California
<b>DATE COMPLETED:</b>	October 2003
<b>SYSTEM SIZE:</b>	675 kilowatts (DC STC rating)
<b>SYSTEM COST:</b>	\$7.5 million (\$4.1m for solar + \$3.4m for efficiency)
<b>TOTAL COST/WATT:</b>	\$6.07/watt
<b>ELECTRICITY OUTPUT:</b>	825,000 kWh/year

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### SUMMARY

In November 2001, reacting to rolling blackouts and soaring energy prices, San Francisco voters overwhelmingly approved a \$100 million bond initiative to fund solar generation, energy efficiency measures and other renewable power sources for public buildings. The Moscone Center energy project, at San Francisco's premier conference facility, is the first solar project to be completed since the solar bond passed.

### PROJECT COST

Solar	\$4.1 million
Energy Efficiency	\$3.4 million
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GROSS PROJECT COST	\$7.5 million
PUC Self-gen Subsidy (solar)	-\$2.1 million
Energy Commission Incentive (efficiency)	-\$175,000
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NET PROJECT COST	\$5,225,000



### PROJECT DESCRIPTION

The 675 kilowatt solar electric system on the Moscone Center rests on two rooftops. One 468 kWp array uses PowerLight's roofing tiles incorporating Sanyo Corp's high efficiency, dual ply photovoltaic modules and will have a 15% efficiency factor, the highest commercially available. The other array uses 207 kWp of PowerLight roofing tiles incorporating Shell Solar modules. All the solar roof tiles, which are connected with a tongue & groove mounting system and do not require roof penetrations, are mounted flat on the roof and are not visible from the ground. The panels are mounted on polystyrene insulation blocks which provide additional insulation to the building and reduce heating and cooling loads.

**ANNUAL ELECTRIC GENERATION AND SAVINGS**

Solar electricity generated 826,000 kWh  
Energy saved from efficiency upgrades 4,067,658 kWh

NET REDUCTION OF UTILITY ELECTRICITY 4,893,658 kWh

ANNUAL UTILITY BILL SAVINGS \$614,643

**BUNDLING ENERGY EFFICIENCY AND SOLAR ENERGY**

The success of the Moscone solar project lies in the combination of energy efficiency upgrades with solar energy. Energy efficiency upgrades, which can yield dramatic performance improvements, are relatively inexpensive. The solar component, which provides clean electricity, energy independence to the city and has generated considerable public attention, is more expensive. But by combining the solar and efficiency, the Moscone Center was able to create a cost-effective project, allowing San Francisco to generate electricity more cleanly and use it more wisely.

**ENERGY EFFICIENCY BENEFITS**

- 40% Increase in Lighting Quality and Lighting Levels in the Exhibit Halls
- "Instant On" Lighting Fixtures in Exhibit Halls Provide Improved Lighting Distribution
- Reduced Lighting Maintenance Costs Due to New, Longer-lasting Lamps
- Improved Energy Management and Lighting System Controls Provides Greater Flexibility and Savings

<b>LIGHTING METRIC</b>	<b>DESCRIPTION</b>	<b>BEFORE</b>	<b>AFTER</b>
CRI	Color Rendition Index	60	85
Lamp Life	After - T5/HO/MH	15,000 hrs	20-25,000 hrs
Light Level	Footcandles	60	85
Watts per fixture	Archway/High Bay Fixture	570 - 2525	234 -1274

**NEW JOBS**

The manufacture, retail sale and installation of solar electric systems creates immediate high-value, sustained job growth. Jobs growth is concentrated in the solar sector, but includes increased jobs in related sectors such as roofing, electrical wiring, and energy efficient appliances. In addition, by using local labor to install solar systems, the economic benefits and dollars generated remain in the local economy.

