

Edison Technology Park



Solar Power supplies 100% of the electrical energy used to power the 30 on-site businesses

Edison Technology Park is an innovative, four building, 48 unit research and development business park located in the unincorporated area of San Mateo County adjacent to Menlo Park. Starting today, 100 percent of the electrical energy used by the over 150 people working in 30 businesses at the complex will be supplied by the sun. **The onsite solar generation plant, which cost over \$3.6 million, is the largest multi-tenant commercial solar project completed in the Bay Area this year and is one of the biggest privately funded alternative energy generation projects in the State of California.** Sunlight is converted into electrical energy by over 2,388 individual solar modules from three different manufacturers, wired together to produce an impressive 394,845 watts of peak (DC) power. On hot summer afternoons, when California's electric grid is under maximum stress, the system is designed to generate electricity far in excess of the complex's requirements. During such times of peak demand, the solar system will be exporting enough energy to power over 100 homes in the surrounding Atherton and Redwood City neighborhoods, reducing demand on the local electric grid.

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Innovative Financing and Design

In addition to its substantial public benefits, the project is a source of pride to existing tenants as well as to the building owners, Ronald and Agnes Newdoll of Woodside.

Ron acted as designer and general contractor for the project, which took approximately 2 years from concept to completion. Detailed system engineering and installation of the solar system was provided by Quantum Energy Group and Dr. Neway Argaw. Financing included over \$1.5 million in rebates from the State of California's Self-Generation Incentive Program.

FACTS AT A GLANCE

Tenant Occupied Space
85,000 sq.ft.

Solar Panels
2,388 (33,000 sq.ft.)

Rated Power Output
394,845 watts (DC)

CEC Rated Output
315,876 watts (AC)

Annual Energy Production
570,000 KW hours (est.)

Total System Cost
\$3.6 million

Lifetime Avoided Pollution
10 million lbs. CO₂ (est.)

The solar system was installed as part of an extensive renovation and architectural facelift for the research and development complex. The design is attractively integrated into the architecture of the buildings and includes the innovative use of solar panels on the front facades to form multiple solar awnings. This interesting feature enhances the building's appearance while providing substantial passive solar benefits.

Free Electricity?

In order to take advantage of economies of scale, Newdoll replaced over 50 individual electric meters at the Edison

complex with four bi-directional PG&E meters (one for each building), unified the electrical systems and renegotiated the terms of the tenant leases to include utilities. This allowed the construction of a large, efficient solar power plant and simplified interconnection with the electric grid. The system is sized to deliver over 570,000 KW hours of renewable electrici-



plex, while at the same time tracking solar power production. This information is available online, updated every five minutes. Cumulative usage and power production data can also be accessed for period to date and by month, for the whole complex as well as for each individual suite. This is expected to be a valuable tool for managing energy use and spotting unusual

ty, more than adequate to meet 100% of the buildings' total consumption on an annual basis. However, in order to encourage responsible use of electricity by his tenants, a state of the art energy monitoring and management system was installed as part of the project.

This system, which tracks solar power production and building consumption on a real-time basis, involved custom design and programming by Sunnyvale based Wattminders.com. The system measures natural gas, electricity and water usage for all 48 suites in the com-



15 inverters from three different manufacturers convert solar DC power to AC and interface with the local electric grid.

Unique south facing solar wing contains 220 panels which supply 35KW while shading building number one.

spikes in consumption which are often the result of equipment problems such as a leaky toilet or an improperly programmed thermostat. As an added benefit, the system facilitates remote monitoring of the solar system to insure its proper operation.

Environmental Benefits

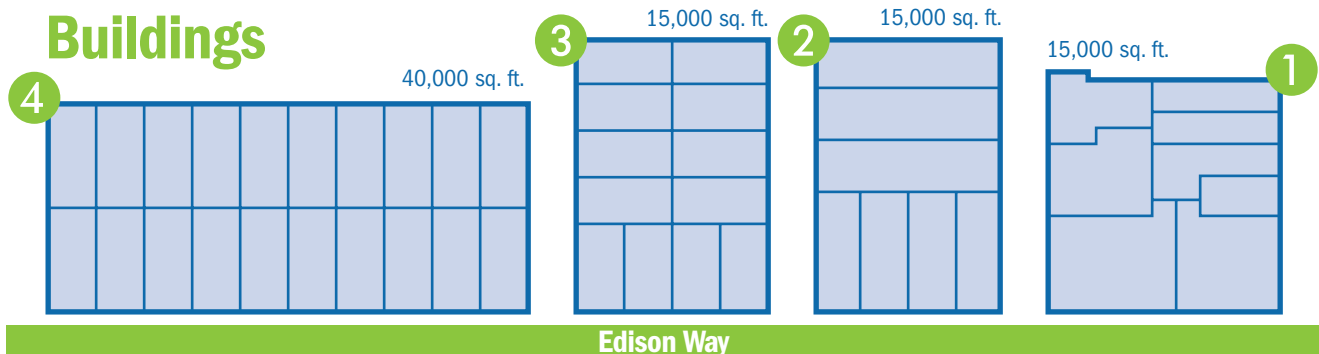
Over the anticipated 30 year life of the system, it is expected to generate over 17,000,000 KW hours of pollution free electricity, avoiding the burning of non-renewable fossil fuels and the production of almost ten million lbs. of CO₂. In addition, this installation and similar ones throughout California mean that fewer polluting power plants and controversial upgrades to the electric grid will have to be built to accommodate the increased consumption by the state's growing population.

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Solar System Component Specifications

	Vendor	Module No.	Kw	Watts	Quantity	DC Watts
Building 1						
Solar Panels	Shell	SQ 165-PC		165	220	36,300
Inverters	SMA Sunnyboy	SB 6000 U	6		7	
Building 2						
Solar Panels	BP	4170		170	165	28,050
	Schott	SAPC 165		165	297	49,005
					Subtotal	77,055
Inverters	SMA Sunnyboy	BP 6000 U	6		1	
	Solectria	PV175	75		1	
Building 3						
Solar Panels	Schott	SAPC 165		165	606	99,990
Inverters	SMA Sunnyboy	BP 6000 U	6		1	
	Satcon	AE-100-60-PV	100		1	
Building 4						
Solar Panels	Schott	SAPC 165		165	1,100	181,500
Inverters	Solectria	PV 113	13		4	
	SMA Sunnycentral	125 U	125		1	

Total Panels	2,388	Solar Project Planning Commenced	January 2004
Total Inverters	16	Construction Commenced	January 2005
Rated Power Output	394,845 watts (DC)	Construction Completion	January 2006
CEC Rated Output	315,876 watts (AC)	Final PG&E	February 2006



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Project Vendor List

Vendor	Contact	Phone	Vendor	Contact	Phone
AAA Rentals	Ken Brown	(650) 365-6743	Oneto Metal Products Group	Raymond Liberatore	(916) 681-6555
Accurate Sound Corporation Project Management & Purchasing	Ron Newdoll	(650) 365-2843	PG&E	Dave Turner Sarah Birmingham Robert Talbot Andrew Yip	(415) 973-6143
BP Solar International, Inc. Solar Panel Provider	Neway Argaw	(303) 680-3500	Quantum Energy Group Solar System Engineering & Installation	Matthew Nelson	(530) 878-4585
Breene Kerr Productions Publicity & Marketing	Breene Kerr	(650) 302-9376	Renewable Energy Solutions System Design & Management	Neway Argaw	(303) 680-3500
Carpport Sales	Jerry Schoen	(800) 487-1131	Rexel Norcal Valley, Inc. Switch Gear Provider	Pete Heiman	(530) 885-8411
City National Bank	Chris Wall	(650) 812-8316	Royal Wholesale Electric	Keith Marzak	(650) 610-0143
Consolidated Electric	Scott	(650) 369-3716	RWE Schott Solar, Inc. Solar Panel & Inverter Supply	Mark Bettis	(916) 577-1403
ELM Construction, Inc.	Tim Martin	(650) 492-0777	Sapa Anodizing, Inc. Solar Mounting Hardware	Estelle Barta	(800) 547-0790
Energy Outfitters	Bob Maynard	(541) 476-4200	Shell Solar Industries LP Solar Panel Provider	Neway Argaw	(303) 680-3500
Fastenal	Augustin Raya	(650) 610-0301	SMA America, Inc. Inverter Provider	Bill Reaugh	(530) 271-1825
Herning Underground Supply	Ray James	(510) 782-5330	Solectria Inverter Provider	Michael Zuercher	(978) 683-9700
Independent Electric Supply	Wally Jolliff	(650) 594-9440	United Rentals Northwest	J. Barros	(650) 570-5630
Integrated Power Systems System Design & Management	Neway Argaw	(303) 680-3500	Village Power Design Solar Equipment Provider & Engineering	Jeff Clearwater	(530) 263-7333
Jakaby Engineering	Tom Jakaby	(408) 374-6149	Yang Associates Monitoring System Provider	Stephen Yang	(408) 734-2907
Jose Pulido Asphalt and Striping	Jose Pulido	(650) 630-0297	W. M. Maintenance Roofing Company	Warner Maumasi	(650) 771-6445
Lusk Metals	Mark Rodriguez	(510) 785-6400			
Metropolis Architecture	Lawrence Kahle	(650) 326-1877			
No. California Fence Co.	Garry Gibson	(650) 365-3374			
O.K. Lumber Company	Mr. Mason	(650) 593-6980			
Ozzie's Tree Service	Ozvaldo Rojas	(650) 368-8065			

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