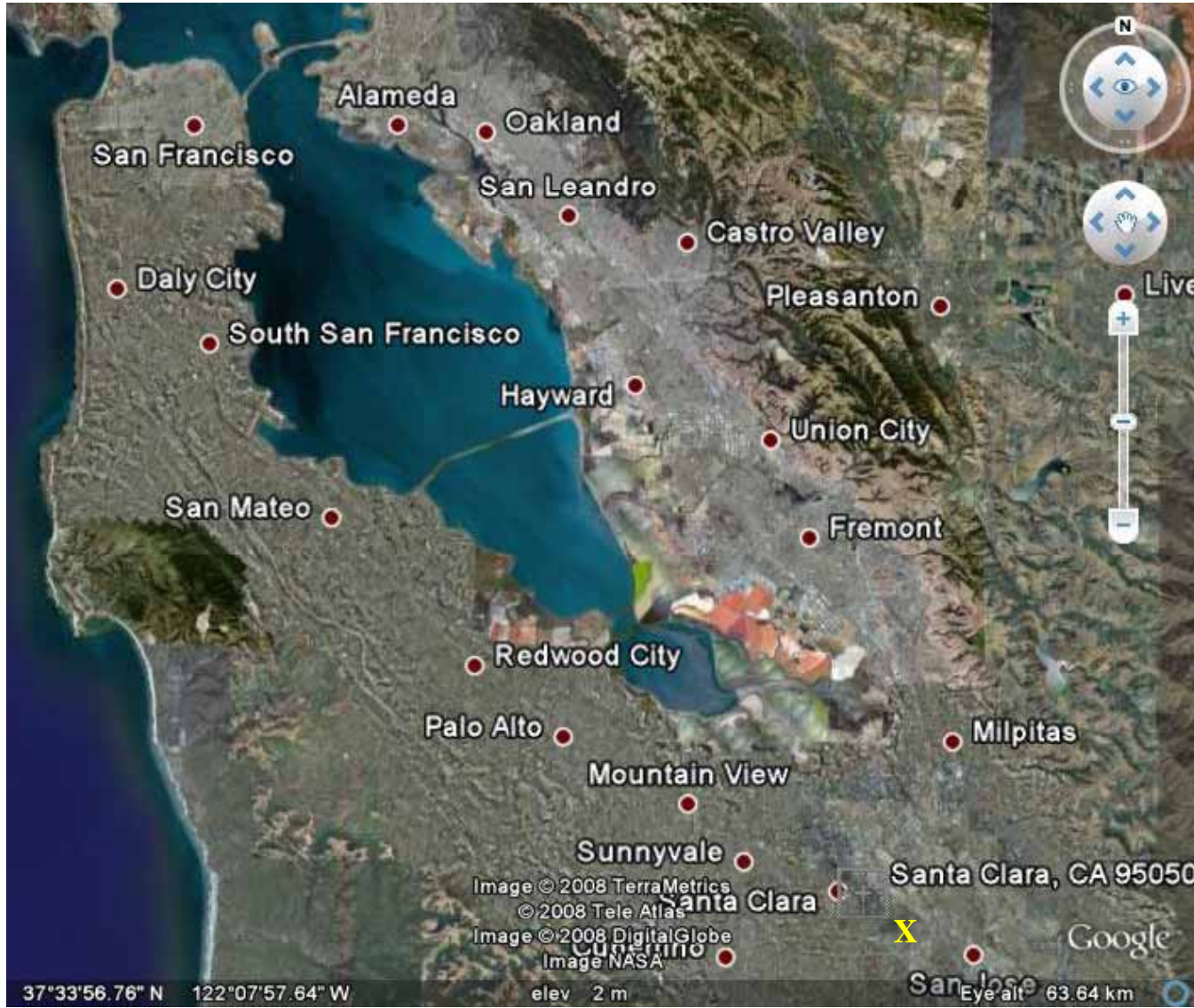


# Silicon Valley Power's Data Center-Focused Energy Efficiency Programs

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# Santa Clara, CA



# Agenda

- Who is Silicon Valley Power?
- Energy Efficiency Programs
- Program Challenges & Solutions
- Project Examples
- Program Results
- Future Outlook



# Silicon Valley Power

- City of Santa Clara's municipal electric utility
- Located 50 miles south of San Francisco
- System Statistics:
  - ~500 MW peak
  - ~3000 GWh sales (70% load factor)
  - 90% of sales are commercial and industrial
  - \$0.089 system average rate
  - Diverse resources throughout Western USA
    - 28.5 % eligible renewable resources (Geothermal, wind, small hydro)
    - 50% including large hydro



# Type of Customers

- High tech headquarters and R&D
  - Intel, Sun Micro Systems, Applied Materials, National Semiconductor, etc.
- **Datacenters**
- Manufacturing
  - Solar and semiconductor
  - Paperboard mills
  - Fiberglass insulation



# Data Centers in Santa Clara

- 17 Existing Stand Alone Data Centers
  - Represents 162,500 MVA of “connected” load (potential load)
- 5 Data Centers Under Construction
  - @ 35 MVA additional “connected” load
- 2 Data Centers On Hold
  - 50 – 80 MVA of future “connected” load
- Numerous smaller data centers within corporate facilities
  - Unknown total load



# Data Center Programs

- Prescriptive Rebates
  - Server Virtualization
  - Standard Rebates (Lighting, HVAC, Motors, VFD, etc)
- Customer Directed Rebate (CDR)
  - Designed for projects that don't fall into prescriptive rebates; pays per kWh of annual savings with approved M&V plan.
- Energy Innovator Grant
  - Similar to CDR but for “innovative” installations. Projects under this program are not subject to annual customer payment cap.



# Data Center Programs

- Design Assistance
  - Design review by an engineer to identify changes that could be made to maximize energy efficiency and receive a rebate.
- Data Center Optimization Program (DCOP)
  - Third party program run by QuEST. Focuses on enterprise data centers under 10,000 sf.
- Retrocommissioning (RCx) – pilot program open to data centers, high tech & hotels





# Program Design Challenges

- IT staff resists projects that are perceived as “risky”
- IT solutions historically focused on performance & first cost, not energy efficiency
- Communication gaps between Facilities & IT staff
- In new construction, speed to market often drives “tried & true” solutions, not innovation
- Colocation providers don’t own IT equipment
- Utility incentive paperwork can be perceived as cumbersome
- Data center technology is constantly evolving



# Solutions

- SVP works to bring Facilities & IT staff together in meetings on data center energy efficiency
- SVP provides Design Assistance Program
  - Early involvement offering advice on energy efficiency and incentives available to offset incremental costs
- SVP's Energy Innovation Grant Program provides incentives for innovative projects
  - Up to \$250,000 per project, per year
  - In addition to cap of \$1,000,000 per customer per year for standard rebates



# Solutions

- SVP rebate process is simplified
  - Forms are simple
  - Assistance is provided in filling them out
  - Checks cut within two weeks of completion
- SVP is working on programs that target “tenants” in colocation facilities
- SVP staff keeps up to date on data center trends & technology
  - Participation in industry groups, conferences, pilot projects, etc.



# Project Examples

- Yahoo! Wireless Sensor Network Adaptive Cooling
  - Airflow management through cold aisle containment
  - Reduced cooling energy by 21% using SynapSense wireless control solution
  - Increased supply temperature by 21 degrees
  - Annual savings of \$563,000.
  - Received SVP Energy innovation Grant funding



# Project Examples

- Sun Microsystems High Efficiency Chilled Water Plant
  - 72,000 sf of data center space over 14 rooms
  - Combination of hot aisle containment and efficient chilled water cooling system
  - \$231,000 in rebates paid by SVP
  - Future plans to upgrade the Building Management System & re-commission



# Program Results for the 2007-2008 Fiscal Year

Company Type	Technologies Applied	GWh Saved	Rebate
Co-location Provider A	Air Economizer	4.6	\$800,000
Co-location Provider B	Air Economizer	1.0	\$185,000
Sun Microsystems	Hot Aisle Containment, High Efficiency Cooling	1.4	\$231,000
Enterprise Data Center A	High Efficiency Transformers, UPS	1.5	\$162,000
Co-location Provider B	VFD – Chilled Water	3.0	\$306,000
Co-location Provider A	VFD – Chilled Water	1.5	\$153,000
Co-location Provider C	VFD – Chilled Water	2.0	\$200,000
Sun Microsystems	VFD – Chilled Water	1.0	\$99,000
<b>TOTAL</b>		<b>15.9</b>	<b>\$2,136,000</b>



# Future Outlook

- Where do we go next?
  - Looking at programs that target tenants in colocation facilities
  - Reviewing programs for low powered servers
  - Potential rebates for DC powered data centers
  - Review of current economizer rebate funding
    - Pays per kWh saved, but doesn't take into account off peak power savings

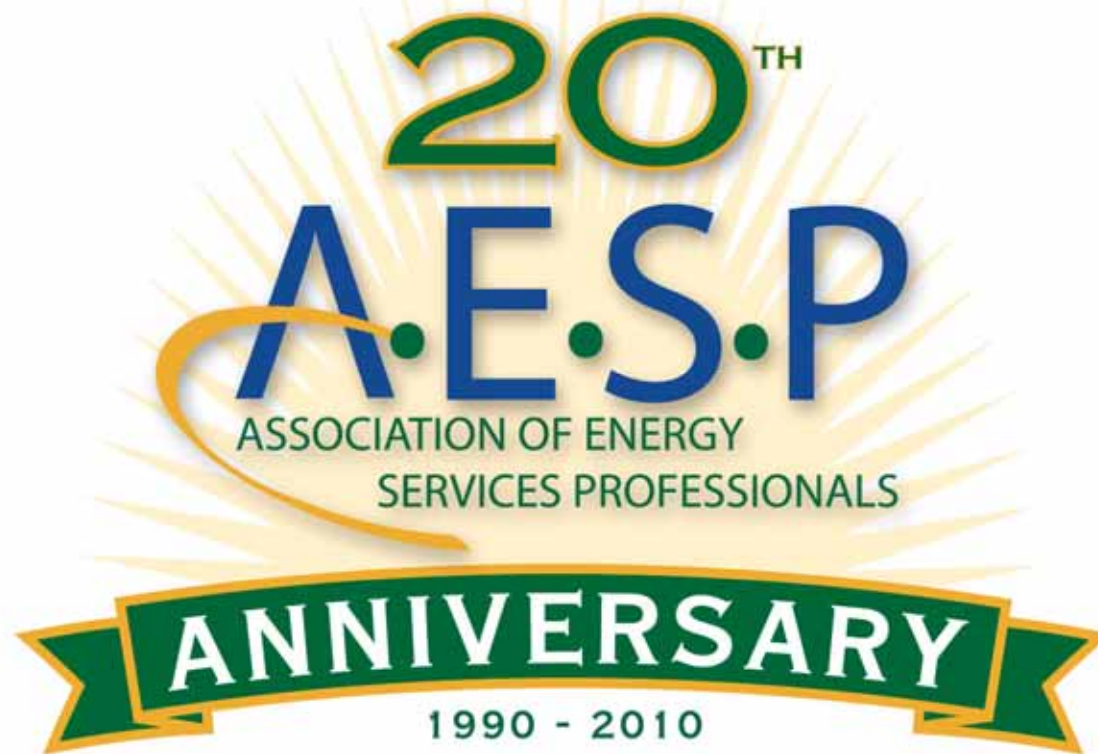


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# Thank You







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