

Energy Technology Assistance Program

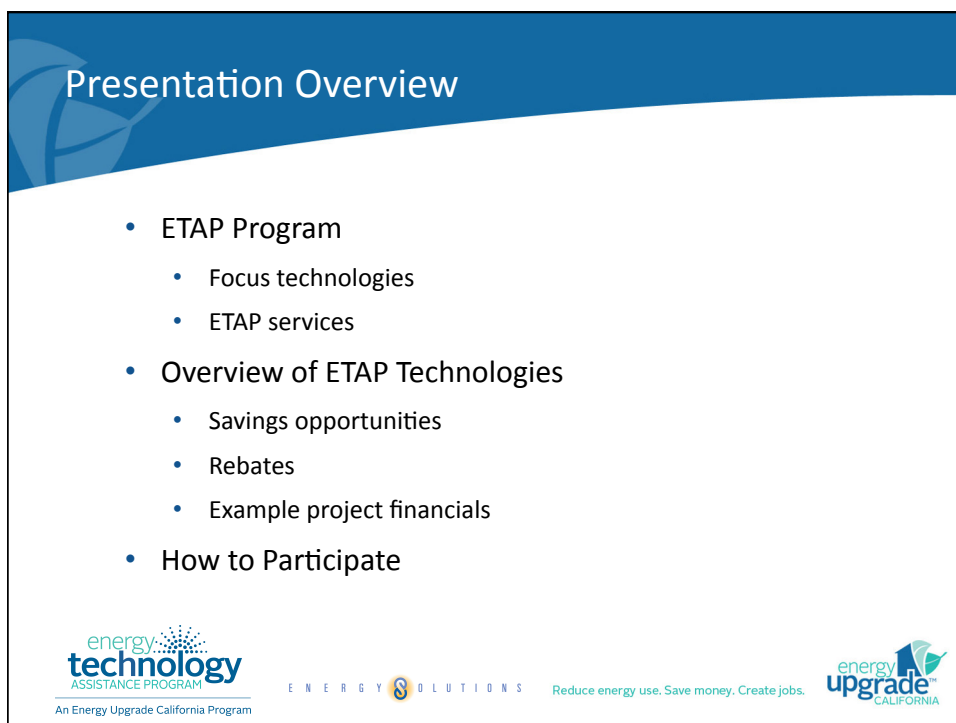
Technology Seminar – June 15, 2011

energy technology ASSISTANCE PROGRAM

Reduce energy use. Save money. Create jobs.

energy upgrade CALIFORNIA

The slide features a teal and blue background with a stylized leaf graphic. The title 'Energy Technology Assistance Program' is prominently displayed in white. Below it, the date 'Technology Seminar – June 15, 2011' is written in a smaller, italicized font. At the bottom, the logos for 'energy technology ASSISTANCE PROGRAM' and 'energy upgrade CALIFORNIA' are shown, along with the slogan 'Reduce energy use. Save money. Create jobs.'



Presentation Overview

- ETAP Program
 - Focus technologies
 - ETAP services
- Overview of ETAP Technologies
 - Savings opportunities
 - Rebates
 - Example project financials
- How to Participate

energy technology ASSISTANCE PROGRAM

ENERGY SOLUTIONS

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energy upgrade CALIFORNIA

An Energy Upgrade California Program

The slide has a blue header with the title 'Presentation Overview'. The main content is a bulleted list with three main items: 'ETAP Program', 'Overview of ETAP Technologies', and 'How to Participate'. Each main item has sub-bullets. The footer contains logos for 'energy technology ASSISTANCE PROGRAM', 'ENERGY SOLUTIONS', 'Reduce energy use. Save money. Create jobs.', and 'energy upgrade CALIFORNIA', along with the text 'An Energy Upgrade California Program'.

ETAP Focus Technologies



- Bi-level lighting fixtures for parking lots and garages
- Wireless lighting controls
- Wireless HVAC controls



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Focus Technology Benefits

- Cost-effective energy savings
- Short payback periods
- Installation that requires minimal disruption to occupants & avoids costly asbestos abatement
- Highly customizable
- Works with variety of building automation systems (BAS)



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ETAP Services to Speed Adoption

- Free technical assistance
 - Project scoping
 - Audits
 - Technical and economic feasibility analysis
- Identification of additional financial resources
- Implementation assistance
- Rebates



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Wireless HVAC Controls



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Wireless HVAC Controls Opportunity

Wireless Networking allows DDC-like functionality without the difficulty of re-wiring

- Significant Energy Savings
 - Especially for Constant Air Volume (CAV) systems
- Improved performance data
 - Zone-level temperatures
- A solution for the most difficult, least controllable buildings (e.g., asbestos).



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ETAP-supported Wireless HVAC Controls

- Wireless Pneumatic Thermostats (WPTs)
 - Less than one quarter the cost of a traditional DDC zone retrofit
 - HVAC energy savings: 10% – 25%
- Discharge Air Regulation Technique (DART)
 - ~10% the cost of a traditional VAV retrofit and minimally intrusive
 - HVAC energy savings: 25% - 55%



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Wireless HVAC Controls Maintenance and Operation Considerations

- Wireless HVAC devices are battery operated
- Systems monitors and reports battery power levels
- May require annual battery replacement but some installations have shown strong battery performance for multiple years



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Wireless HVAC Controls Maintenance and Operation Considerations

- Additional information made available through devices can help troubleshoot and predict complaints resulting in maintenance savings
 - What are actual set points for zones?
 - Are zones maintaining temperature?
 - How are neighboring zones performing?
- Eliminates need for periodic system wide re-commissioning of thermostats



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Wireless HVAC Controls Financial Incentives (ETAP)



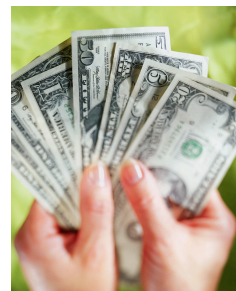
- \$0.18 / kWh annual savings
- Calculated based on estimated project savings



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Wireless HVAC Controls PG&E Financial Incentives



- Incentives for WPT or DART
 - \$0.09/kWh
 - \$100/peak kW
 - \$1.00 / therm from PG&E



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Wireless HVAC Controls Example Project Financials

Values listed below are provided as examples only and may not reflect your project's actual costs or savings

DART	Building Size (sqft)	Assumed # of Zones	Annual kWh Savings	Annual Therm Savings	Annual Energy Cost Savings ¹	ETAP Incentive	Utility Incentive ²	Net Project Cost	Payback
	200,000	230	520,000	70,000	\$ 155,000	\$ 93,600	\$ 50,600	\$108,800	0.7
	90,000	153	234,000	31,500	\$ 69,750	\$ 42,120	\$ 35,190	\$ 98,640	1.4
	25,000	63	65,000	8,750	\$ 19,375	\$ 11,700	\$ 14,600	\$ 48,700	2.5

WPTS	Building Size (sqft)	Assumed # of Thermostats	Annual kWh Savings	Annual Therm Savings	Annual Energy Cost Savings ¹	ETAP Incentive ⁴	Utility Incentive ³	Net Project Cost	Payback
	200,000	200	420,000	2,100	\$ 65,310	\$ 50,100	\$ 69,900	\$ -	Immediate
	90,000	153	189,000	945	\$ 29,390	\$ 34,020	\$ 40,905	\$ 32,175	1.1
	25,000	62.5	52,500	263	\$ 8,164	\$ 9,450	\$ 14,363	\$ 26,188	3.2

Assumptions:

- @ \$0.15/kWh and \$1.10/therm energy rate
- Includes standard utility rebate of \$0.09/kWh and \$1.00/therm
- Includes standard utility rebate of \$0.09/kWh, \$1.00/therm, and \$150/thermostat demand response incentive
- ETAP incentive capped at 100% of project costs after utility incentives.



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Bi-level Lighting for Parking Lots and Garages



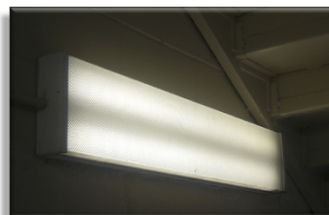
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Parking Garage and Lot Lighting Savings Opportunity

Inefficient Existing Fixtures

- HID
- Older multi-lamp fluorescent



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Parking Garage and Lot Lighting Savings Opportunity

More light is delivered than is needed

- In unoccupied areas
- When daylight is sufficient



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ETAP-supported Bi-level Lighting

Bi-level or dimming fixtures with integrated occupancy sensors

- Garages
- Lots
- Stairwells
- Pathways



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Bi-level Lighting Energy Savings

- Source change from an inefficient fixture
- Reduced light levels when light not needed
- **Energy Cost Savings: 25% - 70%**

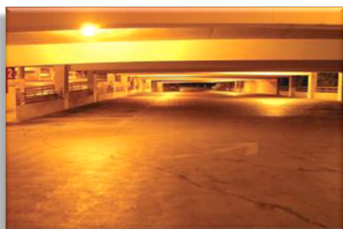


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Bi-level Lighting Other Benefits

- Improved Light Quality



- Improved personal safety
- Extended lamp life lowers maintenance costs



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Bi-level Lighting ETAP Financial Incentives



- ETAP Incentives
 - Bi-level LED - **\$200/fixture**
 - Bi-level T8/T5/Induction - **\$100/fixture**
 - Bi-level Lamp & ballast retrofit (garage only) - **\$40/fixture**



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Bi-level Lighting PG&E Financial Incentives


- LED - **\$0.05/kWh** and **\$100/peak kW** reduction
- T8/T5* - **\$25/fixture**, or **\$0.05/kWh** and **\$100/peak kW** reduction
- Lamp & ballast retrofit / Induction - **\$0.05/kWh** and **\$100/peak kW** reduction

<http://pge.com/mybusiness/energysavingsrebates/rebatesincentives/ief/>
http://pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/lighting_catalog_final.pdf


*Additional prescriptive T8 & T5 incentive options are available, based on fixture types. See PG&E lighting catalog for more details



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Bi-level Lighting Example Project Financials

Existing		Retrofit		Project Summary						
Location Type	Existing Fixture ¹	Existing kWh ²	Fixture	Proposed kWh ³	kWh Saving	Annual Energy Cost Savings ⁴	Total ETAP Incentive	Utility Incentive	Net Project Cost	Payback ⁶ In Years
Parking Garage	150 Watt HPS	287,438	90 W LED, bi-level	120,724	166,714	\$25,007	\$35,000.00	\$10,239	\$93,011	3.54
Parking Garage	100 Watt HPS	211,554	New vapor tite w reflector, occ sensor and 2 F32T8s and a bi-level ballast	72,434	139,120	\$20,868	\$17,500	\$8,544	\$46,581	2.02
Parking Lot	400W Metal Halide	90,272	220 W LED	37,942	52,330	\$7,850	\$9,000	\$2,617	\$26,183	2.76
Parking Lot	250W HPS	58,145	150W Induction	27,766	30,378	\$4,557	\$4,500	\$1,519	\$19,406	3.27


Values listed above are provided as examples only and may not reflect your project's actual costs or savings.

Assumptions:


- 1 175 fixture quantity for garages, 45 fixture quantity for lots - 1 for 1 retrofits
- 2 Annual operating hours of 8,760 for garages, 4,380 for lots
- 3 Bi-level fixtures operate at 50% power, 25% of the time
- 4 \$0.15/kWh energy rate
- 5 Standard utility rebate of \$0.05/kWh, and \$100/peak kW reduction
- 6 Includes estimated maintenance savings \$25 per fixture for garages, \$100 per fixture for lots



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Wireless Lighting Control for Parking Garages and Interior Spaces



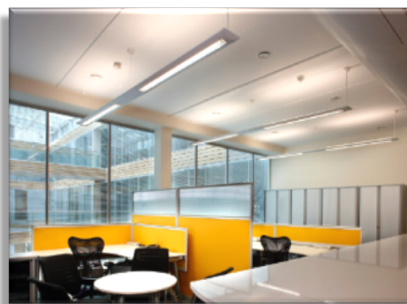
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Interior Lighting Savings Opportunity

More light delivered than is needed

- In unoccupied areas
- In areas which require less light due to:
 - Sufficient daylight
 - Personal preferences



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ETAP-supported Wireless Lighting Controls

Wireless Control Systems

- Parking garages and lots
- Interior space



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Wireless Lighting Controls Energy Savings

Reduced light levels when not needed

- Occupancy sensing
- Automatic scheduling
- Daylight harvesting
- Personal control
- Energy Cost Savings: 10% - 50% (or higher)



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Wireless Lighting Controls Financial Incentives

- ETAP Incentive
 - \$0.18/kWh

- PG&E Incentive
 - \$0.05/kWh and \$100/kW reduction



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Wireless Lighting Controls Example Project Financials

Building Size (sqft)	Annual Energy Cost Savings ^{1,2,3,4}	ETAP Incentive	Utility Incentive ⁵	Net Project Cost	Payback In Years
25,000	\$15,797	\$18,956	\$9,478	\$62,663	4.0
50,000	\$31,602	\$37,923	\$18,961	\$105,087	3.3
150,000	\$94,790	\$113,748	\$56,874	\$276,113	2.9

Values listed above are provided as examples only and may not reflect your project's actual costs or savings.

Assumptions:

- 1 \$0.15/kWh energy rate
- 2 Approximate breakdown of space = 50% open office and 50% private office
- 3 Power at controlled points = 96W
- 4 Approximate blended savings from scheduling, daylight harvesting, presence detection and personal control = 50% for open office and 35% for private office space
- 5 Standard utility rebate of \$0.09/kWh



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How to Participate

- Cities, counties, special districts, community colleges, and universities throughout California are eligible for technical assistance and financial incentives
- Contractors can submit bids to install ETAP projects
- Manufacturers with qualifying products may benefit from ETAP financial incentives
- Public building owners can implement ETAP retrofits, taking advantage of utility incentives



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ETAP Participants

Cities

Berkeley
 Concord
 Covina
 Davis
 Fairfield
 Hayward
 Irvine
 Livermore
 Long Beach
 Oakland
 Palo Alto
 Pleasanton
 Richmond
 Sacramento
 Salinas
 San Bernardino
 San Francisco
 Santa Cruz
 Santa Monica
 Santa Rosa
 Visalia
 Walnut Creek

Counties

Alameda
 Contra Costa
 Marin
 Orange
 Placer
 Sacramento
 San Mateo
 Santa Clara
 Solano
 Sonoma

Public Agencies

AC Transit
 BART
 Port of Oakland
 SMUD

Public Institutions

CalPoly Pomona
 CSU Fullerton
 CSU Long Beach
 Delta College
 Hartnell College
 UC Berkeley
 UC San Diego
 UC San Francisco
 UC Santa Barbara
 UC Santa Cruz
 Cabrillo Community College

TRACK OUR PROGRESS

Number of agencies enrolled:	37
ETAP rebate dollars reserved:	\$574,479
ETAP rebate dollars remaining:	\$1,992,637
Total energy cost savings:	\$426,766
Energy savings in projects with reserved rebates:	3,461,445 kWh



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Follow Up Questions



ETAP Website

<http://energy-solution.com/etap>

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