

Energy Technology Assistance Program



Reduce energy use. Save money. Create jobs.



ETAP Program Objectives



- Provide incentives and technical assistance to support the installation of high efficiency emerging technologies
- Workforce development & technical training
- Facilitate the adoption of ETAP technologies in CA
- Eligible Participants
 - Local governments (cities & counties)
 - Special districts
 - Public colleges & universities

ETAP Program Funding & Implementation

- Energy Solutions designed program and serves as implementer
- Contract for funding awarded by the California Energy Commission via the State Energy Program
- Funding part of American Recovery and Reinvestment Act of 2009
- An Energy Upgrade California Program



ETAP Technologies



- Bi-level lighting for parking garages & parking lots
 - LED, Fluorescent & Induction
- Wireless HVAC controls
 - Cypress Wireless Pneumatic Thermostats
 - Federspiel Controls DART
- Wireless lighting controls
 - Adura Wireless Technologies

Program Status

- Projects must begin implementation in 2011
- Program ends March 2012
- New participants currently being added

TRACK OUR PROGRESS

Number of agencies enrolled:	30
ETAP Incentive dollars reserved:	\$861,251
ETAP incentive dollars remaining:	\$1,705,865
Total energy cost savings:	\$950,260

ENERGY SAVINGS IDENTIFIED:

744 kW | 7,060,531 kWh | 58,189 Therms

Bi-level Lighting Retrofits

Garage Lighting – Energy Savings Opportunity

- Inefficient existing fixtures
 - HID / HPS
 - Multi-lamp fluorescent
- Lighting often on 24/7
- More light is delivered than is needed:
 - In unoccupied areas
 - When daylight is sufficient



Bi-level Lighting Retrofits

Bi-level or Dimming Fixtures

- Low light mode (~50% dimmed)
- High light mode triggered by occupancy sensors
- Energy savings: 25% - 70%
 - Source change from inefficient fixture
 - Reduced light levels when not needed

ETAP Incentives

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

Benefits



- Energy savings
- Utility bill savings
- Improved light quality
- Improved personal safety
- Lamps running fewer hours extends lamp life and lowers maintenance costs

AC Transit's Bi-level Retrofit



- 5 Facilities – parking lots and garages
- Replacing high pressure sodium and metal halide fixtures with LEDs
- ETAP incentive = \$23,200
(21% of project cost)
- Estimated PG&E incentives = \$4,200
(4% of project cost)
- Estimated energy savings = 83,215 kWh
(~50% savings)
- Estimated cost savings = \$12,000/yr

AC Transit Bi-level Project Estimates

Facility Name	Peak Power Reduction (kW)	Electric Savings (kWh/yr)	Energy Cost Savings (\$/yr)	Total ETAP Incentive	Estimated Utility Incentive	Project Cost (after incentives)	Avoided Maintenance Cost	Payback (yrs)
CMF	1.6	20,351	\$3,053	\$4,400	\$1,173	\$14,181	\$1,150	4.3
D2	2.2	19,582	\$2,937	\$7,000	\$1,203	\$26,622	\$875	8.8
D6	0.0	15,963	\$2,395	\$4,800	\$798	\$17,140	\$1,700	6.4
Training	0.0	5,150	\$772	\$2,000	\$257	\$6,657	\$1,000	7.3
GO	0.0	16,395	\$2,459	\$5,000	\$820	\$16,930	\$2,500	5.9
TOTALS	3.8	77,441	\$11,616	\$23,200	\$4,251	\$81,530	\$7,225	6.4

Wireless Lighting Retrofits

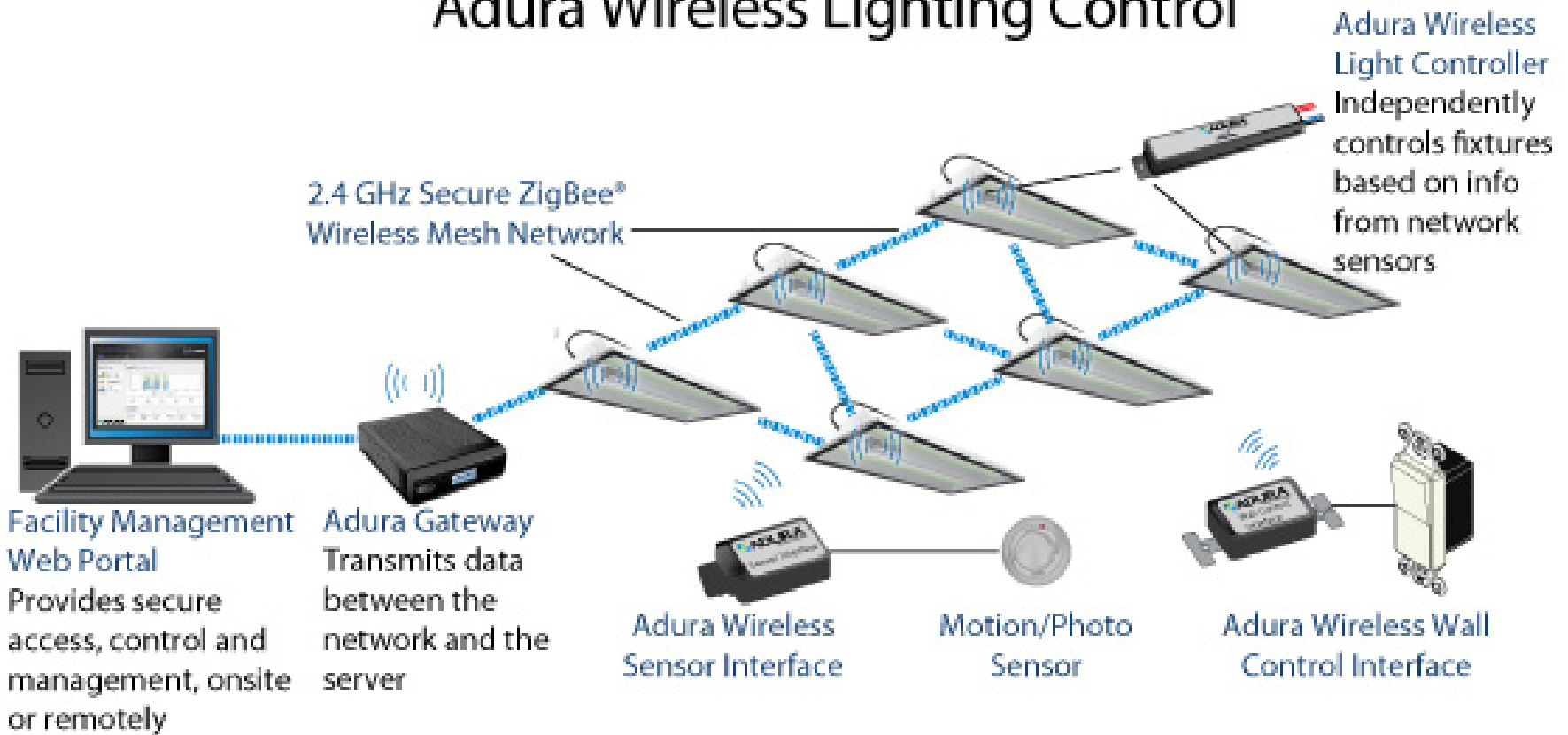
Interior Lighting – Wireless Controls Savings

- Reduced light levels when not needed:
 - Occupancy sensing
 - Automatic scheduling
 - Daylight harvesting
 - Personal control
- Energy Cost Savings: 10% - 50% (or higher)



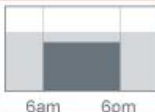
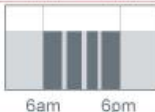
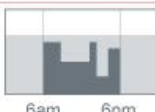
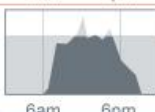



Adura Wireless Technologies

Adura Wireless Lighting Control



Adura Energy Saving Strategies

Strategy Employed	Savings Expected	
Smart Scheduling	10-40%	 kW
Daylight Harvesting	5-15%	 kW
Task Tuning	5-20%	 kW
Presence Detection	25-50%	 kW
Personal Control	5-15%	 kW
Demand Management	5%	 kW
Total	50-75% (Blended)	 kW

Wireless Lighting Control Retrofits

ETAP Incentives Based on Estimated Energy Savings

- **\$0.18/kWh**

Benefits

- Increased control & comfort
- Demand response
- Utility bill & energy savings
- Lamps running fewer hours extends lamp life and lowers maintenance costs
- Continuous monitoring

Pleasanton Public Library Wireless Controls Project Estimate

Est. Electric Savings (kWh/yr)	Est. Energy Cost Savings (\$/yr)	Equip. & Maint. Savings (\$/yr)	ETAP Incentive	Est. Utility Incentive	Project Net Cost (Including Incentives)	Simple Payback (yrs)
132,289	\$19,843	\$1,942	\$23,812	\$6,614	\$124,390	6.0



Estimated Savings Opportunity

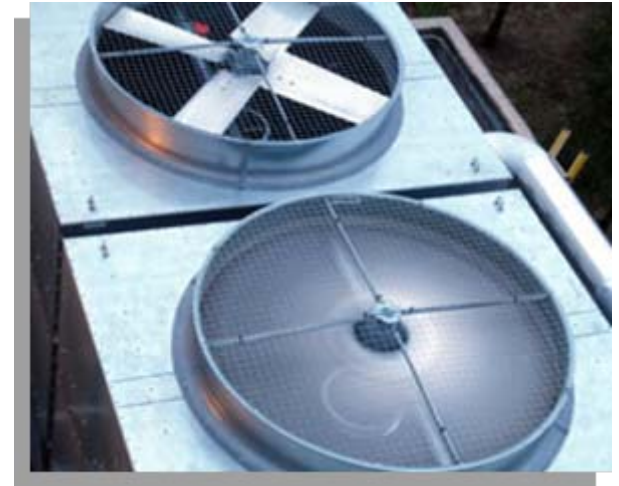
Library Space Type Breakdown (24,000 sq. ft)		Open Areas	Private Offices	Conference/ Meeting	Total
			92%	5%	3%
Energy Savings per Control Feature	Scheduling	15%	15%	15%	
	Day lighting	16%	0%	0%	
	Occupancy Sensors	3%	21%	19%	
Total Savings		34%	36%	34%	34%*

*Weighted by Space Type

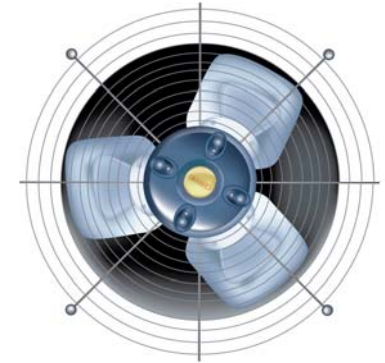
Wireless HVAC Retrofits

Federspiel Controls DART

- Approximates VAV control in CAV systems through the use of zone temperature sensors, a wireless mesh network, and fan VFDs
- ~10% the cost of a traditional VAV retrofit and minimally intrusive
- HVAC energy savings: 25%-55%



DART Saves Energy by Modifying CAV Systems



- Constant Air Volume (CAV) systems have fans that run at single speed regardless of demand
- Common in new buildings through 1980s in CA
- Inefficient when temperatures are moderate
- Variable Air Volume (VAV) systems allow fans to run at variable speeds
- Cutting air speed in half saves 81% of fan energy
- Delivering minimum ventilation air requires less heating and cooling

Wireless HVAC Retrofits

Cypress Envirosystem's Wireless Pneumatic Thermostats

- Wireless pneumatic thermostats (WPTs) replace standard pneumatically controlled thermostats enabling greater temperature & scheduling control
- Less than one quarter the cost of a traditional direct digital control (DDC) zone retrofit
- HVAC energy savings: 10% – 25%

Wireless Pneumatic
Thermostat



Wireless Pneumatic Thermostats - WPTs

- WPTs allow digital two-way communication with the building's building automation system
- Minimizes disruption & eliminates need for asbestos abatement
- Building must be equipped with pneumatic thermostats and system should be in working order: i.e., compressor is serviceable, etc.



ETAP Incentives for Wireless HVAC Controls

Incentives Based on Estimated Energy Savings

- **\$0.18/kWh**

County of Sacramento Wireless HVAC Project Estimates

County of Sacramento Facility	ETAP Project	kWh Savings (kWh/yr)	Therm Savings (therms/yr)	Energy Cost Savings (\$/yr)	Total ETAP Incentive	Estimated Utility Incentive	Project Cost (after incentives)	Payback (Years)
Old Admin Building	DART	131,800	2,121	\$16,089	\$23,724	\$12,665	\$67,101	4.2
Dept of General Services	DART	63,397	1,588	\$10,464	\$11,411	\$6,660	\$41,600	4.0
Sheriff's Adm Building	WPTs	58,769	1,910	\$8,375	\$10,578	\$6,612	\$54,360	6.5

Wireless HVAC Sample Project Estimates

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:

1. @ \$0.15/kWh and \$1.10/therm energy rate
2. Includes standard utility rebate of \$0.09/kWh and \$1.00/therm
3. Includes standard utility rebate of \$0.09/kWh, \$1.00/therm, and \$150/thermostat demand response incentive
4. ETAP incentive capped at 100% of project costs after utility incentives.

Paying for Energy Efficiency Projects



- Energy Efficiency Block Grant Funding
- General funds
- Revolving energy project funds
- Utility incentives
 - Customized & Partnership programs
 - On-bill financing
- Other incentive programs
 - ETAP
 - Honeywell Auto-Demand Response
- CEC low interest loans (3%)

Thank you!

Contact Information

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