

## DOCKETED

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**On 8/12/16 Workshop on Barriers of Low-Income and Disadvantaged Communities**

Presentation

*Additional submitted attachment is included below.*



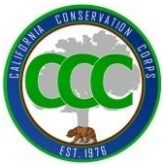
# California Conservation Corps

## - Energy Corps -

- Version 10.1 -



**Contact:** Bill McNamara ([Bill.McNamara@ccc.ca.gov](mailto:Bill.McNamara@ccc.ca.gov))



# The CCC & Energy Conservation

## - Background & Context -



- **California State Agency**: A department of the Natural Resources Agency, the California Conservation Corps (CCC) was established in 1976 by Governor Jerry Brown.
- **26 Operational Centers Statewide**: 7 Residential and 19 Non Residential CCC centers.
- **Workforce Development**: Over a 40 year period, the CCC has provided exemplary work/learn based job training and work experience for more than 120,000 thousand young Californians between the ages of 18 and 25 (and returning Veterans through age 29).
- **Long History of Energy Programs and Projects**: The CCC has provided many Energy Efficiency (EE) and Renewable Energy (RE) programs and projects in partnership with State and Federal agencies, companies of all types, Contractors, Utilities, City and Local governments.
- **Continuum of Education**: Classroom and lab based training provided by University and Energy Industry expert partners, followed by extensive 'on-the-job' professionally supervised work experience and training. The CCC has a substantial and well established statewide infrastructure and support network of CCC resources, operational centers, and staff capable of delivering EE and RE services for Sponsor and Client programs and projects.
- **EE \ RE Program & Project Design**: The CCC provides EE and RE project and program design and implementation development services to Sponsors and Clients on a 'no cost' consultative basis.
- **CCC & Local Corps**: The CCC and the 14 local California Corps (certified annually by the CCC) can provide capable, well trained and managed, cost effective, and 'high availability' EE and RE program and project resources throughout California.



# CCC Energy Corps

## - Goals & Funding -



### The Energy Corps Program is designed to meet the following goals:

- **Create Job Opportunities – Through Energy Industry Training and Work Experience**
  - For energy industry and other workforce entrants; including young adults, recently returned veterans, and others.
  - Develop ‘next generation’ of energy industry workers through a tiered program of training, on-the-job education, and extensive energy industry work experience.
- **Save Energy, Reduce Operating Costs, Reduce GHGE**
  - Conduct ASHRAE compliant ‘no cost’ and ‘low cost’ Energy Opportunity Surveys that collect and provide all energy efficiency information necessary to identify, calculate, maximize, and ‘capture’ the available energy savings benefits.
  - Perform ‘low cost’ Energy Efficiency ‘Retrofit’ installations that generate substantial and sustainable energy use reductions, cost reductions, and GHGE savings.

### Energy Corps Funding Sources:

- **Directly Funded State, Federal, and Local Programs**  
Such as the Proposition 39 “Clean Energy Jobs Creation Fund”, CECVARRA funded
- **Reimbursement Contracts** with ESCOs, Energy Engineering Companies, Utilities, Energy Contractors, and 3<sup>rd</sup> Party EE Program Providers.

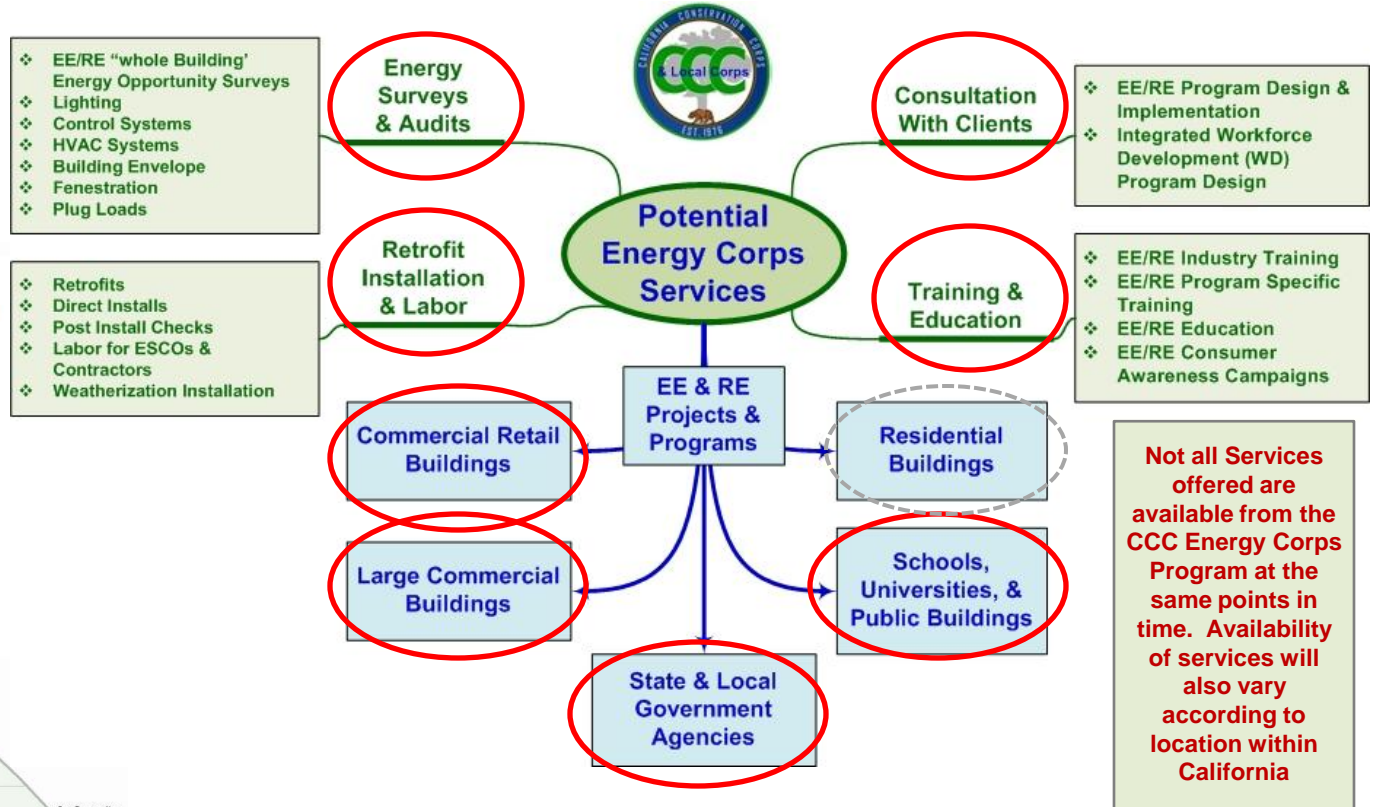


# CCC Energy Corps

## - Current Energy Program & Project Service Offerings -



### 26 CCC Centers & 14 Local Corps



○ Current Energy Corps Services    ○ Planned Energy Corps Services

**There are currently 4 CCC Energy Opportunity Survey Crews & 6 Energy Efficiency Retrofit Crews Operating from CCC Centers Located Statewide**



# CCC Energy Corps

- Proposition 39 Funded Services For LEAs -



**Prop 39 Funding  
Direct Allocation  
to CCC**



**CCC & Participating  
Local Corps  
Providing  
'No Cost' & 'Low  
Cost' EE & RE  
Services  
Statewide For LEAs**

Corpsmembers



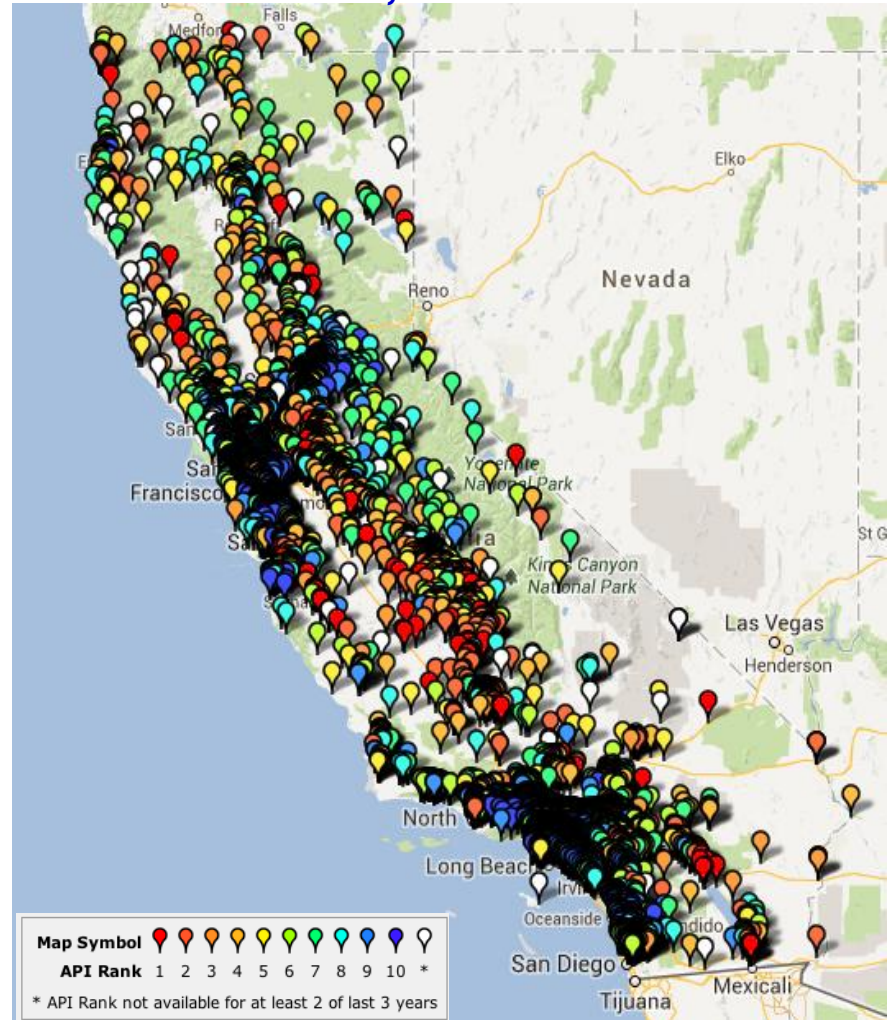
**Prop 39 Funding  
Distribution From  
CDE to LEAs**

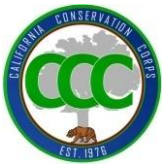


**LEAs**

- \* 'Low Cost' Energy Opportunity Surveys
- \* 'Low Cost' EE Retrofit Projects
- \* 'No Cost' EE Presentations

## Distribution of 2,000+ California LEAs

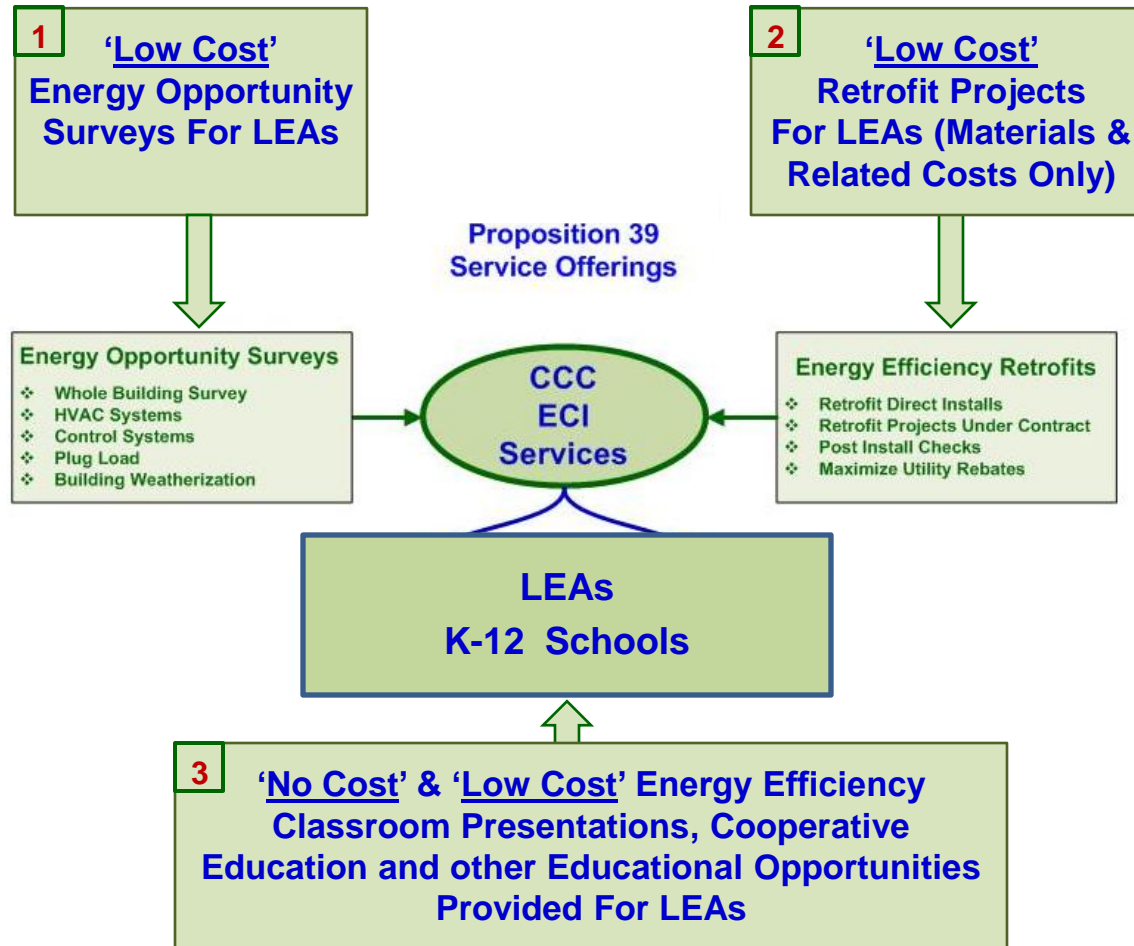




# CCC Energy Corps



## - Proposition 39 Funded Service Offerings For LEAs -







# CCC Energy Corps

## - Energy Opportunity Surveys: Content -



**Energy Opportunity Survey Training:** Corpsmembers are professionally trained to conduct American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) compliant whole building “Energy Opportunity Surveys” to assess the condition of buildings, identify EE opportunities and establish building performance baselines.

**Valuable Energy Data:** Collected by professionally trained Corpsmembers helps to create a more comprehensive statewide energy efficiency database for use by state & local EE planners.

**Survey Content:** Each CCC “Whole Building” Energy Opportunity Survey includes the following:

Data collection for all Lighting & Control Systems, HVAC, internal Plug Loads, integrated Energy Management systems, O&M ‘Best Practices’, Fenestration, and the building ‘Envelope’.

**Survey Data Analysis & Reports:** Analysis of the data and preparation of the final reports is performed by Energy Corps Program Partner **UC Davis Energy Efficiency Center (‘UCD EEC’)** and other Energy Corps Partners and providers. This includes utility bill information to track energy use over time, benchmarking to determine a baseline of energy use, identification EE savings opportunities, and calculating available estimated potential savings, & preparation of the Survey Report .



Table 1 — ENERGY AUDIT REQUIRED TASKS

Process	Level		
	1	2	3
Conduct PEA	•	•	•
Conduct walk-through survey	•	•	•
Identify low-cost/no-cost recommendations	•	•	•
Identify capital improvements	•	•	•
Review mechanical and electrical (M&E) design and condition and O&M practices	•	•	•
Measure key parameters	•	•	•
Analyze capital measures (savings and costs, including interactions)	•	•	•
Meet with owner/operators to review recommendations	•	•	•
Conduct additional testing/monitoring	•	•	•
Perform detailed system modeling	•	•	•
Provide schematic layouts for recommendations	•	•	•

Report	Level		
	1	2	3
Estimate savings from utility rate change	•	•	•
Compare EUI to EUIs of similar sites	•	•	•
Summarize utility data	•	•	•
Estimate savings if EUI were to meet target	•	•	•
Estimate low-cost/no-cost savings	•	•	•
Calculate detailed end-use breakdown	•	•	•
Estimate capital project costs and savings	•	•	•
Complete building description and equipment inventory	•	•	•
Document general description of considered measures	•	•	•
Recommend measurement and verification (M&V) method	•	•	•
Perform financial analysis of recommended EEMs	•	•	•
Write detailed description of recommended measures	•	•	•
Compile detailed EEM cost estimates	•	•	•

**Content of Energy Opportunity Survey Consisting of Items Circled Above in Blue and Yellow**

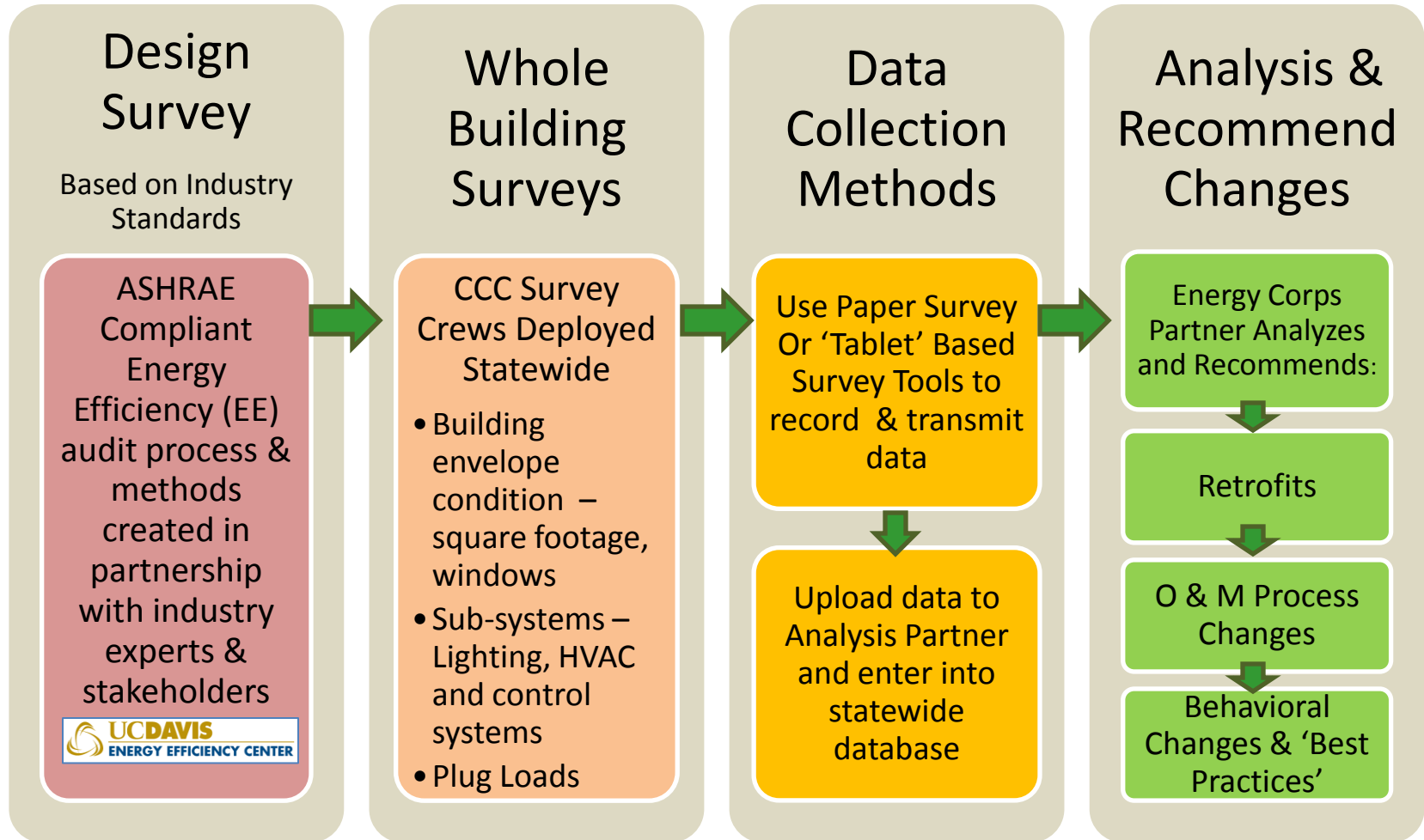


# CCC Energy Corps

## - Energy Opportunity Surveys: Process -



**ASHRAE Compliant Energy Opportunity Surveys are Created and Implemented as follows:**





# CCC Energy Corps

## - Energy Opportunity Surveys: Survey Reports -



The CCC's ASHRAE compliant Energy Opportunity Survey Data Collection and Reports provide energy use data and recommendations necessary to support the Improvement of Energy Efficiency in any type of building.



### Executive Summary

The CCC conducted an on-site Energy Opportunity Survey of the "Example" Elementary School on 01/15/2014. The CCC crew surveyed a total of 11 buildings on the campus and catalogued all electricity and natural gas using equipment.

Figure 1: Current Annual Energy Costs and Potential Savings

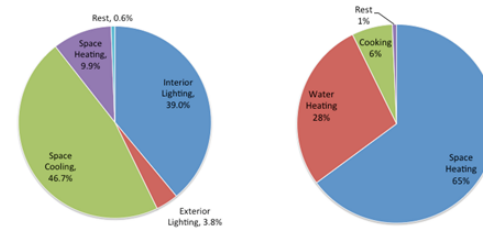
Currently, total electricity and natural gas costs are about \$17,835 per year. With the help of school O&M staff, we identified 8 energy conservation measures (ECMs) with a total potential savings of \$7,461 per year. Each of these ECMs has a unique simple payback period. The simple payback period for these ECMs ranges from 1.7 to 57 years. The total potential savings of all energy conservation measures would decrease current energy costs by 42%.



Figure 2: Electricity and Natural Gas End Use Percentages

According to our calculations, HVAC accounts for 57% of all electrical energy use, while lighting accounts for 43%. Based on the 2006 study by U.S. Green Building Council (USGBC), the typical California school uses 30% of all electricity use on HVAC and 48% on lighting.

Space heating accounts for nearly 66% of all natural gas energy use at the school. Water heating and cooking represent 28% and 6% of total natural gas use, respectively. Based on the USGBC study, the typical California school uses 63% of all natural gas use on space heating, 29% on water heating, and 6% on cooking.



CCC Energy Opportunity Survey Recommended Best Practices



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CCC Energy Opportunity Survey Recommended Whole Building "Best Practices"

Operations & Maintenance (O&M) and Energy Efficiency Measures (EEM)

The Purpose of this document is to provide California School Districts and other LEAs that request and receive Energy Opportunity Surveys from the California Conservation Corps (CCC) with a detailed 'checklist' perspective and approach to energy efficiency opportunities that may currently exist within their buildings for a wide range of energy efficiency 'Best Practices' and 'Energy Efficiency Measures'. The scope of the recommended energy efficiency 'Best Practices' and 'Energy Efficiency Measures' contained in this document is intentionally broader than the scope of the "Proposition 39 Guidelines" published by the California Energy Commission (CEC).



### "Sample" Energy Opportunity Survey Report

Intermediate School, CA

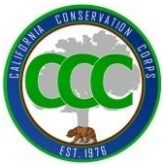
UC Davis Energy Efficiency Center  
Prop39@ucdavis.edu

06/09/14

Comprehensive 'No' & 'Low Cost' ASHRAE Energy Opportunity Survey Reports for all Buildings audited.

Reports include benchmarking, comprehensive energy use inventories, recommended EEM and Best Practices, for all buildings.

Surveys include a detailed 'Workbook' identifying most potential Energy Efficiency issues for building envelope & energy use 'subsystems', and provides extensive recommended 'Retrofits' and 'O&M Best Practices'.



# CCC Energy Corps

## - EE Retrofit Installation Services -



### Lighting Retrofits:

Since the Autumn of 2015, CCC Energy Corps Crews have installed various lighting and controls technologies throughout the State totaling **67,288 Lighting Fixtures** and **3,991 Lighting controls**. The following are some examples of the types of Lighting technologies installed to date:

### Lighting Fixtures

[50W Led Troffer Retrofit Kit ZY-R7-50W](#)

[175W MH Wall Wash Downlight](#)

[39W LED Small Area Flood](#)

[42W LED Medium Wall Pack](#)

[Phillips LED Strips](#)

[130W LED Shoebox](#)

[Philips 32w EVO LED kit](#)

[Ceiling mounted LED outdoor drum fixture](#)

[LED High Bays](#)



### Lighting Controls

[WattStopper Occupancy Sensor](#)

[Lutron MS wall switch Sensor](#)

[Daintree Wireless Controls](#)





# CCC Energy Corps

## - Proposition 39 Funded Program Updates -



**Status: Energy Corps Proposition 39 Services:** In January of 2014, the CCC's 'Energy Corps' began to deploy **10** Crews of trained and supervised Corpsmembers to provide ASHRAE compliant 'Whole Building' Energy Opportunity Surveys (energy audits) for Local Educational Authorities (LEAs) throughout California. In 2015 the Energy Corps began providing EE Retrofit Installation Services. The results of CCC Proposition 39 funded services to date is as follows:

### Prop 39 - Operations - December 2013 to Date

8/4/2016

#### Project Information

<b>LEAs Requesting Services:</b>	<b>426</b>	
Number of Schools Sites Requested:	1,319	
<b>Number of Completed Projects:</b>	<b>1,267</b>	
<b>Total Energy Surveys Completed:</b>	<b>1,232</b>	
<b>Total Buildings Surveyed</b>	<b>12,238</b>	
<b>Total Square Footage Surveyed</b>	<b>68,952,014</b>	
<b>LEA's Surveyed Total</b>	<b>345</b>	
LEA's Surveyed Over 5000 ADA	64	<b>19%</b>
LEA's Surveyed Under 5000 ADA	281	<b>81%</b>
LEA's Surveyed Over 50% FRPM	249	<b>72%</b>
<b>Total Retrofit Projects Completed</b>	<b>35</b>	
<b>Total # of Lighting Retrofits</b>	<b>69,561</b>	
<b>Total # of Controls Retrofits</b>	<b>3,991</b>	
<b>Estimated Annual KWH impact/YR</b>	<b>4,448,988</b>	
<b>Estimated CO2 Reduction ( M-Tons)</b>	<b>1,058</b>	
<b>LEA's Retrofitted Total</b>	<b>30</b>	
LEA's Retrofitted Over 5000 ADA	8	<b>28%</b>
LEA's Retrofitted Under 5000 ADA	21	<b>72%</b>
LEA's Retrofitted Over 50% FRPM	16	<b>53%</b>

#### Training Information

<b>Corpsmembers:</b>	Trainees:	Hours
<b>Survey Training</b>	<b>501</b>	<b>23,944</b>
OSHA 10/30 Training	288	3,170
<b>Retrofit Training</b>	<b>227</b>	<b>18,249</b>
Presentation Training	88	440
Energy University Courses	255	1,797
<b>Total</b>		<b>47,600</b>
<b>Staff:</b>	Trainees:	Hours
<b>Survey Training</b>	<b>41</b>	<b>2,152</b>
OSHA 10/30	23	290
<b>Retrofit Training</b>	<b>20</b>	<b>1,600</b>
Presentation Training	0	0
Energy University Courses	5	25
<b>Total</b>		<b>4,067</b>
<b>Grand Total:</b>	<b>542</b>	<b>51,667</b>



More than **80** CCC Energy Corps Corpsmembers Hired By Energy Industry Companies To Date





# CCC Energy Corps

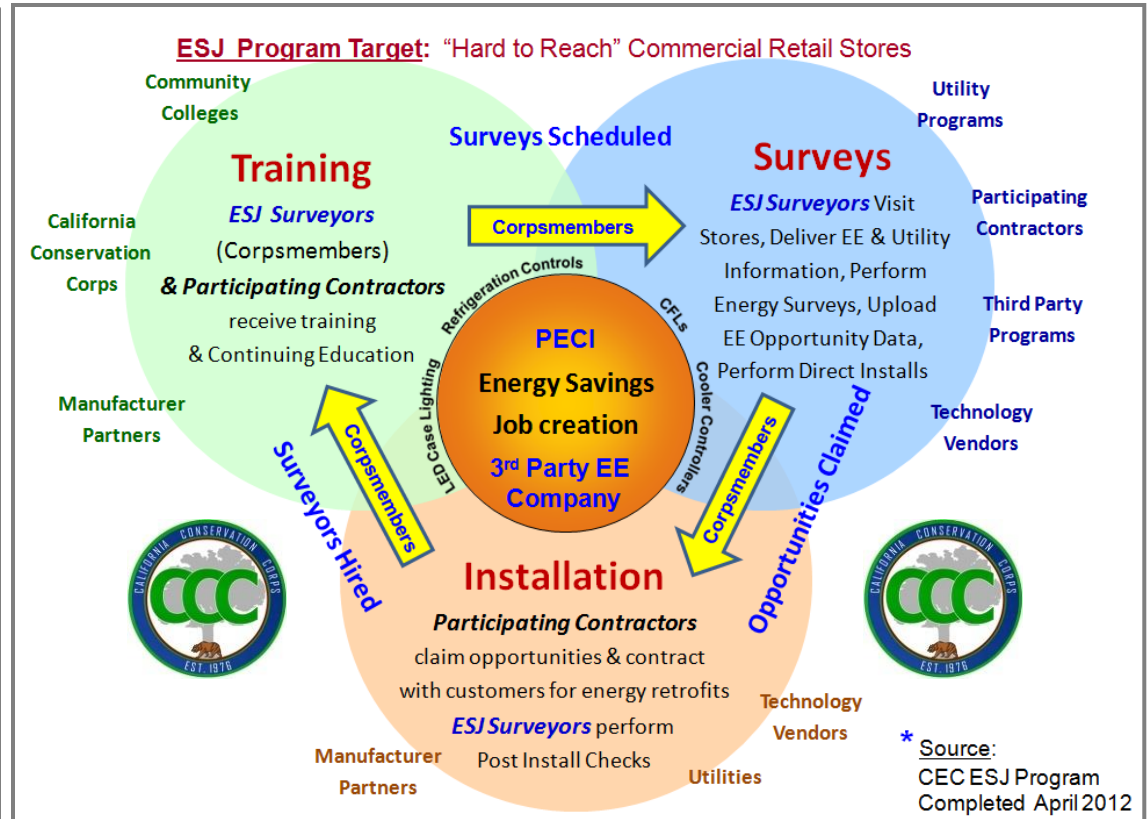
- Example: CEC/ARRA "Energy Smart Jobs" Program -



## 2011 to 2012: Statewide 'Pilot' Program Leading to Current Energy Corps Program Model

### CEC/CCC ESJ Program Results:

- 260 Jobs Created
- 8,800 Small Retail Stores Visited
- 6,200 EE Surveys Completed
- 5,100 Stores Retrofitted
- 21,000 Retrofit Direct Installs
- 1,800 'Post Install' Checks
- 62 + Million kWh (annual)
- \$5.2 + Saved (annual)
- 97 % Customer Satisfaction Rate



The ESJ Program was a very successful CEC Energy Program. It worked with IOU and MOU and related EE Programs Statewide, and was delivered to "Hard to Reach" Store Owners and Operators in more than 20 languages by Corpsmembers – who were frequently from the same communities.



# CCC Energy Corps

## - Energy Industry: Employment Opportunities -



### Energy Industry Employment Opportunities:

- The Energy Industry Needs Many New Employees with Energy Efficiency Audit & Retrofit Training
- Current Energy Industry Employees are Retiring in record numbers
- Demand for Energy Use & Efficiency Increasing
- Current Trained Energy Industry Workforce Can Not Meet Demand for Energy Industry Growth

**Energy Corps trained Corpsmembers are part of the Solution for the Energy Industry !**

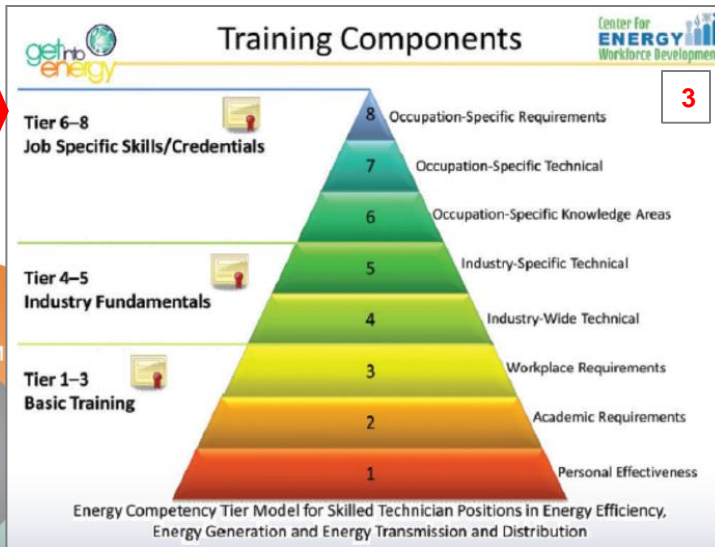
### Perspectives from the Energy Industry ...

**Energy Industry Rife With Opportunities But Labors To Find Skilled Workforce** 1

#### Magnitude of the Talent Shortage 2

- Available jobs expected to double from 1.7 million to 3 million
- 72 % of energy executives believe the ability to attract quality candidates to the energy industry will have a significant impact on North American competitiveness in the decades to come
- 58% of executives say their company “struggles to find the talent it needs.”
- 74% say the problem will get worse in the next five years.
- 66% of employers say they expect the number of energy industry jobs to increase in the next five years

**Energy Corps Trains For All ‘Levels’**

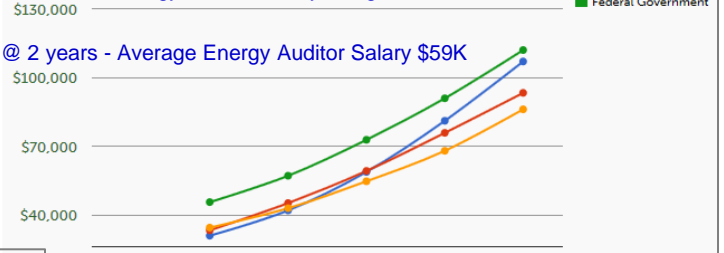


1, 2, 3, 4: Source: [http://www.manpower.us/Website-File-Pile/Webinar-Recordings/Manpower/Energy-Webinar-Presentation\\_061114](http://www.manpower.us/Website-File-Pile/Webinar-Recordings/Manpower/Energy-Webinar-Presentation_061114)

#### ANNUAL SALARY US Energy Auditors

**Excellent Paying Jobs!**

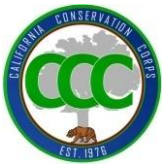
#### Energy Auditor Salary Ranges



**5** Source <https://www.recruiter.com/salaries/energy-auditors-salary/>



**4**



# CCC Energy Corps

- Videos of CCC Proposition 39 Funded Services -



For more information about the CCC's Energy Corps, please visit the CCC Website:  
<http://www.ccc.ca.gov/work/programs/prop39/Pages/default.aspx>

## CCC ENERGY CORPS

### CCC Energy Corps Proposition 39 Program Update

*Short Video Clips of the Energy Corps*

<p>SAVING ENERGY THROUGH WORKFORCE INNOVATION</p> <p>The CCC Energy Corps – Saving Energy Through Workforce Innovation</p> 	<p>TRAINING THE WORKFORCE THROUGH RETROFIT PROJECTS</p> <p>The CCC Energy Corps – Training the Workforce Through Retrofit Projects</p> 
<p>TRANSFORMING THE ENERGY EFFICIENCY MARKETPLACE</p> <p>The CCC Energy Corps and UC Davis EEC – Transforming the Energy Efficiency Marketplace</p> 	<p>TRAINING AND CAREER OPPORTUNITIES FOR YOU</p> <p>The CCC Energy Corps – Training and Career Opportunities for You</p> 