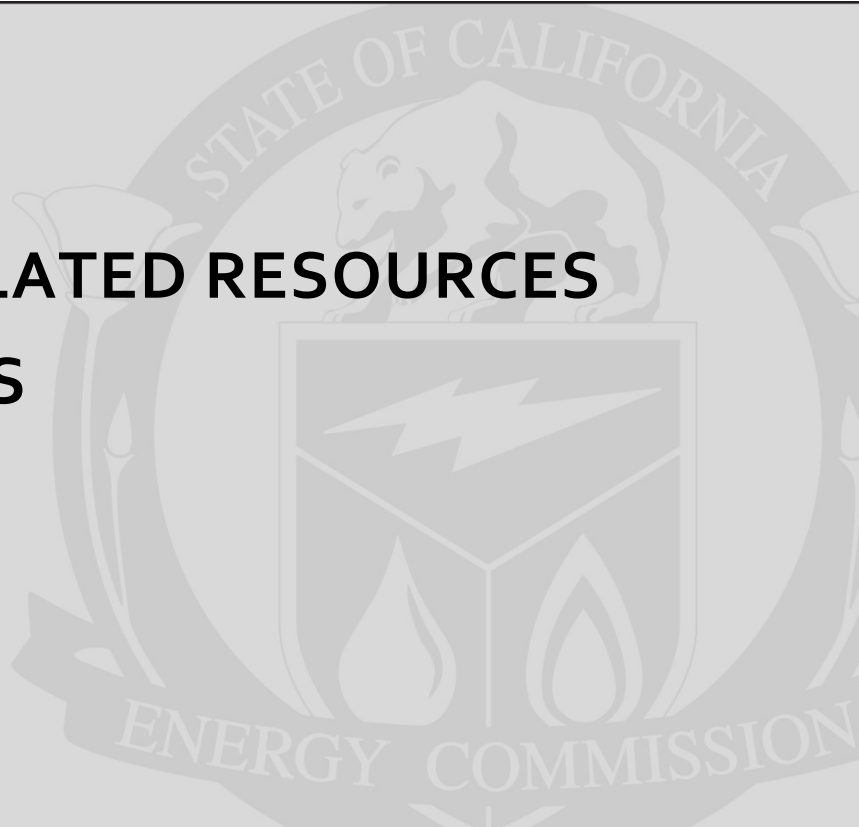


ENERGY - RELATED RESOURCES FOR SCHOOLS



CALIFORNIA
ENERGY COMMISSION

Edmund G. Brown Jr., Governor

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Energy - Related Resources for Schools

The following resources are provided to LEAs for informational purposes only. References to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise does not constitute or imply an endorsement, recommendation, or approval by the Energy Commission. Rebate (incentive and funding) programs mentioned here are subject to change and cancellation by the respective organization.

Benchmarking Tools

1. ENERGY STAR®—Portfolio Manager (USEPA): An online program that rates energy performance on a scale of 1–100 relative to similar facilities nationwide. The link below provides the Portfolio Manager Web page, as well as many other k-12 resources offered by ENERGY STAR.
http://www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12
2. Operations Report Card (Collaborative for High Performance Schools [CHPS]): An online tool that helps school building owners and operators benchmark the performance of seven metrics, including energy, for existing schools and provides a report card of results, including suggestions for improvements. <http://www.chps.net/dev/Drupal/orc>
3. Energy Challenger (San Diego Gas & Electric): An online survey designed to help find ways to improve energy management.
http://regarchive.sdge.com/business/rebatesincentives/programs/energy_Challenger.shtml
4. EnergyIQ: An action-oriented benchmarking tool for nonresidential buildings. It provides a deeper level of analysis that complements the ENERGY STAR Portfolio Manager. <http://energyiq.lbl.gov/>

Commissioning Tools

1. California Commissioning Collaborative: A group of government, utility, and building-services professionals committed to developing and promoting commissioning practices in California. <http://www.cacx.org/>
 - a. Energy Savings Calculation Tools and Data Analysis Tools: Microsoft Excel workbooks and training documents for building commissioning measures and the retrocommissioning process.
http://www.cacx.org/resources/rcxtools/spreadsheet_tools.html#energy_savings_calculation_tools

- b. Existing Building Commissioning Toolkit: Templates, sample documents, request for proposal (RFP) checklist.
http://www.cacx.org/resources/rcxtools/templates_samples.html
 - c. Commissioning Providers, including building types: http://www.cacx.org/resources/provider_list.html
 2. Commissioning Assistant: A Web-based reference designed to provide project-specific commissioning information to the design team.
<http://www.energydesignresources.com/resources/software-tools/commissioning-assistant.aspx>
 3. Energy Savings Calculation Tools and Data Analysis Tools: Microsoft Excel workbooks and training documents for building commissioning measures and the retrocommissioning process.
http://www.cacx.org/resources/rcxtools/spreadsheet_tools.html#energy_savings_calulations_tools
 4. New Construction Building Commissioning Best Practice, Building Commissions Association, December 8, 2011
<http://www.bcxa.org/wp-content/pdf/BCA-Best-Practices-Commissioning-New-Construction.pdf>

Design Resources

1. Energy Design Resources: Sponsored by the investor-owned utilities (IOUs), provides decision-making tools for architects, engineers, lighting designers, and developers.
<http://www.energydesignresources.com/buildings/schools.aspx>

Energy Audits — Project Identification

1. ASHRAE Level 1 Audit: Walk-Through Analysis/Audit
 - a. The Level 1 audit is a simple audit, screening audit, or walk-through audit. It involves interviews with site operating personnel, a review of facility utility bills and other operating data, and a walk-through of the facility, all geared toward identifying glaring areas of energy waste or inefficiency.
<https://www.ashrae.org/resources--publications/bookstore/procedures-for-commercial-building-energy-audits>

2. ASHRAE Level 2 Audit: Energy Survey and Analysis
 - a. The Level 2 audit includes the preliminary ASHRAE Level 1 analysis, but also includes more detailed energy calculations and financial analysis of proposed energy efficiency measures. The financial analysis provides a comprehensive understanding of the financial benefits of implementing specific energy efficiency measures. The energy auditor collects and evaluates utility bills covering a period of 24 to 36 months, which allows for an assessment of the facility's energy/demand rate structures and energy usage profiles.
<https://www.ashrae.org/resources--publications/bookstore/procedures-for-commercial-building-energy-audits>
 - b. The California Energy Commission's *Guide to Preparing Feasibility Studies for Energy Efficiency Projects* (Publication Number P400-00-002) provides a quality ASHRAE Level 2 audit.
http://www.energy.ca.gov/reports/2000-03-20_400-00-002.PDF
3. California Conservation Corps (CCC) Energy Efficiency Opportunity Survey: CCC members perform the field work in partnership with third-party energy efficiency firms which analyze data and produce retrofit recommendations appropriate to the scale of the project, potential energy and cost savings, return on investment (ROI), and available funding levels. For additional information, visit
<http://www.ccc.ca.gov/work/programs/prop39/pages/default.aspx>
4. California Energy Commission Bright Schools Program: Provides comprehensive energy audits to K–12 schools at no cost. For additional information, call 916-654-4104 or visit <http://www.energy.ca.gov/efficiency/brightschools/index.html>.
5. Investor-Owned Utility (IOU) Energy Audit Programs:
 - a. Pacific Gas and Electric Company (PG&E) Business Energy Checkup: A do-it-yourself energy assessment. Visit <http://www.pge.com/en/mybusiness/account/diy/businesscheckup.page> or call 1-800-468-4743.
 - b. Southern California Edison (SCE) Business Energy Advisor:
<http://tinyurl.com/brmnrhx>
 - c. San Diego Gas & Electric (SDG&E) Energy Challenger: See “Benchmarking Tools” in this section.

- d. Southern California Gas (SoCalGas) Customer Service Advisor Walk-throughs: Information is available by calling 1-800-GAS-2000.
<http://socalgas.com/index.shtml>

See “Funding Resources” for information on utility rebate programs in this section.

6. Sacramento Municipal Utility District (SMUD) Commercial Energy Calculator: A screening tool designed to calculate energy consumption and model single-building/single-use facilities. This tool will estimate electric and fuel usage and potential areas for savings in SMUD territories.
<http://c04.apogee.net/calcs/comcalc/Profile.aspx?utilid=smud>

Energy Planning and Best Practices

1. Advanced Energy Retrofit Guide: Practical Ways to Improve Energy Performance, K–12:
This guide was commissioned by the U.S. Department of Energy (DOE) and presents general project planning guidance as well as more detailed descriptions and financial payback metrics for the most important and relevant energy efficiency measures (EEMs). It offers a practical roadmap for effectively planning and implementing performance improvements in existing buildings.
<http://www.nrel.gov/docs/fy13osti/51325.pdf>
2. Planning for Energy Efficiency (2009) (Coalition for Adequate School Housing [CASH]):
Discusses school energy usage, project identification with a rating system, benchmarking, sample Energy Master Plan templates, and useful websites and resources. <http://www.cashnet.org/EnergyBrochure09.pdf>
3. The Division of the State Architect’s (DSA) Sustainable Schools Resources:
<http://www.sustainableschools.dgs.ca.gov/SustainableSchools/sustainabledesign/energy/energy.html>
4. Best Practices Manuals – Collaborative for High Performance Schools (CHPS):
CHPS has developed best practices manuals to help schools, districts and practitioners to achieve high performance design, construction, and operation. Although these manuals target more than energy efficiency, there is much valuable energy efficiency information included.
<http://www.chps.net/dev/Drupal/node/288>

Energy Management and Project Implementation

1. RFPs for Successful State Programs or Facility Owners: Includes information to prequalify energy service companies (ESCOs), preapproved contracts, project oversight agreement, and selection of an ESCO for a specific project.
<http://www.energyservicescoalition.org/resources/model/documents>
2. Federal Energy Management Program: Energy Savings Performance Contracting: Energy savings performance contracting (ESPC) is a method for developing and implementing a comprehensive project, which may include energy efficiency, renewable energy, distributed generation, cogeneration or combined heat and power, and/or water efficiency measures. An ESPC project is delivered by an ESCO, which will develop, implement, and help arrange financing for the project, and then will monitor the energy savings and often maintain the upgrades over many years (at the discretion of the customer). <http://www1.eere.energy.gov/femp/financing/espcs.html>
3. SMUD Contractors
 - a. HVAC: https://www.smud.org/en/business/save-energy/energy-management-solutions/documents/hvac_list.pdf
 - b. Lighting: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/documents/CI-Lighting-Contractor-List.pdf>

Funding Resources

1. California Energy Commission
 - a. Energy Conservation Assistance Act (ECAA): This program provides low-interest loans to K–12 schools for energy efficiency projects.
<http://www.energy.ca.gov/efficiency/financing/>
 - b. Bright Schools Program: Provides comprehensive energy audits to K–12 schools at no cost. For additional information call 1-916-654-4104.
<http://www.energy.ca.gov/efficiency/brightschoools/index.html>

2. Investor-Owned Utility Energy Efficiency Rebate Programs

a. Pacific Gas and Electric Company

- Retrocommissioning (RCx): A systematic process for identifying less-than-optimal performance in a facility's equipment, lighting, and control systems and making the necessary adjustments.
<http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/retrocommissioning/>
- School Energy Efficiency (SEE) Program: Offers K–12 school districts energy services for project evaluation.
<http://schoolenergyefficiency.com/>
- Money-Back Solutions K–12: Information to help school districts better manage energy costs.
<http://www.pge.com/mybusiness/energysavingsrebates/incentivesbyindustry/schoolsandcolleges/prekto12/>

b. Southern California Edison

- Retrocommissioning: <http://www.sce-rcx.com/>
- Express Solutions: Offers SCE business customers cash rebates to offset the cost of replacing or upgrading to high-efficiency equipment that can improve their facilities' energy efficiency.
http://www.sce.com/business/ems/express_solutions.htm
- Customized Solutions: Offers financial incentives for the installation of new high-efficiency equipment or systems. Examples of projects include common retrofits like HVAC and refrigeration upgrades, or more specialized process improvements and customized equipment replacements.
<http://tinyurl.com/bwuqf76>
- Business Web Page:
<https://www.sce.com/wps/portal/home/business/savings-incentives>
- Schools Web Page:
<https://www.sce.com/wps/portal/home/business/ems/schools>

c. San Diego Gas & Electric

- Retrocommissioning: <http://www.sdge.com/rcx-retrocommissioning-program>

d. Southern California Gas Company

- Retrocommissioning: <http://www.socalgas.com/for-your-business/energy-savings/rcx.shtml>
- Rebates and Energy Efficiency: A variety of energy efficiency programs and services designed to help businesses save money and energy. <http://www.socalgas.com/for-your-business/rebates/industry/schools/>

3. Investor-Owned Utility Financing Programs

a. On-Bill Financing: Zero-interest financing for business customers.

- PG&E: <http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/taxcredit/onbillfinancing/>
- SCE: <http://www.sce.com/business/onbill/about-on-bill.htm>
- SDG&E: Investor-Owned Utility Demand Response Programs — Demand response (DR) is when electric utilities pay their customers to temporarily use less electricity at critical times of the day when electricity is more expensive. DR reduces the need to build power plants that will be used only a few hours a year during peak electricity times. Most utilities have DR programs in which schools can participate. In addition, private companies called demand response aggregators will pay a school for reducing its electricity consumption when needed and sell these load reductions to the utilities. The easiest type of DR to participate in is an air-conditioner cycling program, where the utility turns an air-conditioning system off for short periods during DR “events.” Studies show that most participants do not notice that these events have occurred, so a school community is not likely to notice any reduced comfort level. <http://www.sdge.com/bill-financing>

b. PG&E Demand Response Information:

<http://www.pge.com/mybusiness/energysavingsrebates/demandresponse/>

- c. SCE Demand Response Information: <http://tinyurl.com/ckmugbw>
- d. SDG&E Demand Response Information: <http://www.sdge.com/save-money/demand-response/overview>

4. Los Angeles Department of Water and Power (LADWP) Rebate Programs

- a. Retrocommissioning Express Program:
https://www.ladwp.com/ladwp/faces/ladwp/commercial/c-savemoney/c-sm-rebatesandprograms/retrocomm-exp-prog?_adf.ctrl-state=35p0elhk3_4&_afLoop=230261688511000
- b. Commercial Lighting Efficiency Offer (CLEO): Provides rebates to reduce electricity bills and the cost of new lighting equipment when retrofitting existing fixtures with state-of-the-art, energy-efficient lighting technologies.
https://www.ladwp.com/ladwp/faces/wcnav_externalId/c-sm-lighting?_adf.ctrl-state=apweogyp_4&_afLoop=730877354731000
- c. Commercial Refrigeration Program: Provides rebates to reduce electricity bills and the cost of new refrigeration equipment. (Sample measures include ice machines, solid and glass refrigerator doors, door gaskets, night covers, strip curtains, and vending machine controllers.)
https://www.ladwp.com/ladwp/faces/wcnav_externalId/c-sm-refrigtion?_adf.ctrl-state=apweogyp_4&_afLoop=731910089516000
- d. Custom Express Program: Offers rebates for specific measures to efficiently control energy use of networked computers, ENERGY STAR–certified office equipment, and other plug loads.
https://www.ladwp.com/ladwp/faces/wcnav_externalId/c-sm-cut-express?_adf.ctrl-state=apweogyp_4&_afLoop=732046240530000
- e. Custom Performance Program (CPP): Offers incentives for the installation of energy-saving measures, equipment, or systems that exceed current Title 24 or minimum industry standards.
https://www.ladwp.com/ladwp/faces/wcnav_externalId/c-sm-cust-perform-prog?_adf.ctrl-state=apweogyp_4&_afLoop=731055776558000

5. Sacramento Municipal Utility District (SMUD): 1-877-622-SMUD (7683)

- a. Energy Management Control Systems
 - Performance Incentive: <https://www.smud.org/en/business/save-energy/energy-management-solutions/control-systems/performance-incentive.htm>
- b. Express Incentives: Turnkey solutions to save energy and money on retrofits
 - Lighting: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/lighting/express-incentives-lighting.htm>
 - HVAC: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/incentives-for-heating-and-cooling/express-incentives-air-conditioning.htm>
 - Refrigeration: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/refrigeration/express-incentives-refrigeration.htm>
- c. Prescriptive Incentives
 - Lighting: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/lighting/prescriptive-lighting-incentives.htm>
- d. Custom Incentives: Financial incentives to make retrofits that improve the efficiency of systems.
 - Lighting and Controls: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/lighting/customized-lighting-incentives.htm>
 - HVAC: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/incentives-for-heating-and-cooling/customized-incentives-air-conditioning.htm>
 - Refrigeration: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/refrigeration/customized-incentives-refrigeration.htm>
- e. Plug Load Sensors and Equipment: <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/office-equipment.htm>

- f. Loans: \$10,000 to business customers who are investing in energy efficiency measures, with the consideration of higher loan amounts on a case-by-case basis.
<https://www.smud.org/en/business/save-energy/rebates-incentives-financing/business-improvement/smud-loans.htm>
6. American Association of School Administrators (AASA) Toolkit: Cost-Effective Financing for School Construction and Renovation: Helping school districts access tax-credit bonds to finance the construction and repair of public schools.
<http://www.aasa.org/content.aspx?id=12676>
7. Financing Energy Upgrades for K–12 School Districts, *A Guide to Tapping into Funding for Energy Efficiency and Renewable Energy Improvements*: This guide focuses on clean energy financing options for school administrators, facility managers, and other K–12 school decision makers who are considering investments in high-performance school projects. The guide explicitly focuses on comprehensive energy upgrades, those that involve multiple measures and are targeted toward achieving significant energy savings, and attempts to provide the foundation needed for successful projects.
<http://emp.lbl.gov/sites/all/files/lbnl-6133e.pdf>

Funding Search Engines

1. Energy Upgrade California (EUC): Website that offers information on energy-saving projects. In the coming months, the site will include links to participating contractors and energy efficiency rebates and incentives.
https://energyupgradeca.org/statewide_tour_page1
2. Database of State Incentives for Renewables & Efficiency (DSIRE): A comprehensive source of information on state, federal, local, and utility incentives for renewable energy and energy efficiency.
<http://www.dsireusa.org/>

Training and Education

Energy Training School Facility Manager

1. Utility Training Centers: Offers training that is relevant to facilities and energy managers. For example:
 - PG&E: <http://www.pge.com/mybusiness/edusafety/training/>

- Sacramento Municipal Utility District (SMUD):
<https://www.smud.org/en/business/education-safety/workshops-and-training/index.htm>
 - SCE: <http://www.sce.com/b-sb/energy-centers/ctac/ctac.htm?from=ctac-redirect>
2. California Workforce Investment Board: Oversees the local workforce investment boards, which can offer tailored training opportunities. <http://www.cwib.ca.gov/>
 3. The Division of the State Architect's Sustainable Schools: Program offers numerous training resources.
<http://www.sustainableschools.dgs.ca.gov/SustainableSchools/training/training.html>

Education — Connections to the Classroom

All facilities upgrades should connect with teachers and students to provide excellent “learning lab” opportunities— which, for example, could provide at-risk youths and career technical education (CTE) students with hands-on training, internship, and mentoring opportunities. Here are some examples of resources that connect energy efficiency to students, teachers, and parents:

- The Los Angeles Unified School District partnered with the “We Build” program (a 10-week, preapprenticeship construction training) and labor unions to provide hands-on opportunities for school facilities construction. <http://www.laschools.org/new-site/we-build/>
- The City of Richmond trains youths, ages 18 to 24, for construction, including energy efficiency and renewable energy, as important components of its RichmondBUILD program. <http://www.ci.richmond.ca.us/index.aspx?nid=1243>
- Strategic Energy Innovations runs energy efficiency awareness and education programs for communities, schools, and postsecondary institutions, as well as energy-related workforce training programs. <http://www.seinc.org/>
- The Alliance to Save Energy (ASE) is a national energy education organization. ASE offers the PowerSave Schools Program, which educates students about energy efficiency and assessing school energy use. <http://ase.org/programs/powersave-schools>
- The Energy Coalition offers energy education programs, including PEAK Student Actions. <http://energycoalition.org/>

- The California Center for Sustainable Energy works with SCE to train teachers in sustainability practices and has run large-scale consumer efficiency programs. <http://energycenter.org/>
- PEAK is an environmental education program, funded by the joint investor-owned utilities, designed to empower students with the knowledge to manage energy use in their homes, schools, and communities. Through hands-on learning, students are inspired to create a more sustainable world. <http://www.peakstudents.org/>

The Pacific Gas and Electric Company (PG&E) Energenius Educational Series offers engaging and interactive programs for students in kindergarten through eighth grade. All the programs have been field tested and correlate to California's academic content standards. <http://www.pge.com/myhome/edusafety/teach/energenius/> The Energy Efficiency Education Program is administered by San Diego Gas & Electric Company (SDG&E) through a contract awarded to the San Diego County Office of Education. This program educates students, teachers, and parents about energy and energy efficiency to provide meaningful solutions to climate change by offering curricular resources based on California's science standards, professional development, and online support. http://k12e3.org/kids_home.php

- Energy Quest administered by the Energy Commission: <http://www.energyquest.ca.gov>

Case Studies and Additional Resources

Non-Energy Benefits in Schools

- Non-Energy Benefits: Status, Findings, Next Steps, and Implications for Low Income Program Analyses in California: <http://www.liob.org/docs/LIEE%20Non-Energy%20Benefits%20Revised%20Report.pdf>
- Daylighting in Schools, Reanalysis Report: <http://www.energy.ca.gov/2003publications/CEC-500-2003-082/CEC-500-2003-082-A-03.PDF>
- Greening America's Schools—Costs and Benefits: <http://www.usgbc.org/resources/greening-america039s-schools-costs-and-benefits>
- Non-Energy Benefits (NEBs) from Commissioning in Schools, Prisons, and Other Public Buildings: http://www.eceee.org/conference_proceedings/ACEEE_buildings/2006/Panel_4/p4_12/paper

- National Clearinghouse for Educational Facilities: <http://www.ncef.org/>
- LEED for Schools Rating System: Recognizes the unique nature of the design and construction of K–12 schools. The rating system, it addresses issues such as classroom acoustics, master planning, mold prevention, and environmental site assessment. <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1586>
- Fresno Unified School District Sees the Light: A case study of a school energy efficiency program. http://www.rsgroup.com/pdf/case_study_fusd.pdf
- Butte Community College: http://www.enovity.com/casestudies_butte.html
- Prevailing Wage Codes: Department of Industrial Relations: http://www.dir.ca.gov/OPRL/FAQ_PrevailingWage.html