California Schools Market Characterization

Submitted to

Pacific Gas & Electric Company

Submitted by

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1 Executive Summary

1.1 Background

The evaluation of Pacific Gas and Electric's (PG&E) PY 2003 Energenius Program and the PY 2003 School Resources Program is somewhat unusual. Traditionally, the evaluation of these two programs has focused on whether the programs achieved the level of participation stipulated in the Program Implementation Plans (PIP). In addition, past evaluations of these two programs have also addressed such issues as participant satisfaction, knowledge gained, and changes at the school site that could result in reductions in energy use.

As a consequence of changes in the design of the Energenius Program and the School Resources Program for PY 2004-05, a traditional evaluation of these two programs for PY 2003 was determined to have limited value. As a result, the evaluation of these two programs for PY 2003 was modified to include only the verification of their respective participation goals, with the remaining evaluation funds devoted to characterizing the school market segment. The verification of participation goals for these two programs was submitted to PG&E as a separate report. This report focuses exclusively on the market characterization of the school segment. Market characterization can generally be defined as a qualitative assessment of the structure and functioning of a market, the primary purpose of which is to understand how the market operates in order to be able to effectively change the way in which the market functions.[1]

1.2 School Programs

In California, there are estimated to be at least 25 energy efficiency programs targeted to schools and administered by utilities, state agencies, and third-party implementers. Some of these programs have a facilities focus, others have a curriculum focus, and still others have a combined focus. Facilities programs are designed to implement both hardware and behavioral changes to reduce energy and demand at the school site; these programs use various strategies that include energy audits, rebates, financing, and training. The benefits from facilities programs are relatively short-term and can be measured. Curriculum programs are designed to introduce curriculum materials about energy use, conservation, and energy efficiency into K-12 classrooms. The intermediate and long-range benefits of increased knowledge, changes in attitudes, and changes in behavior from these programs can also be measured, but measuring the effects of these benefits on future reductions in energy use is somewhat more difficult. The school programs identified in this study are described more fully in Section 9.

1.3 Research Objectives

The primary objective of this report is to characterize the school market sector in order to inform the development and implementation of programs targeted to the school sector. The term "market characterization" is generally used to refer to a qualitative assessment of the structure and functioning of a market, the primary purpose of which is to understand how the market functions in order to be able to effectively change the way in which the market functions. That is, if those who design and implement energy efficiency programs for the school sector

[1] Hall et al, 2004.

understand such factors as the number of students, ethnic and linguistic diversity, access to computers and the Internet, number of schools, the age and physical condition of the buildings, funds available for renovation and new construction, the planning and budget cycles, and the decision-making processes at the state, district, and school levels, then they can make more informed decisions about program design.

1.4 Methods

This market characterization report relies on the analysis of publicly available data for California's public and private schools. .

1.5 Conclusions and Recommendations

In this section, we present our key conclusions and recommendations.

1.5.1 Energy and Demand Potential

The kWh and therms consumed annually by elementary and secondary schools in the four IOU service territories, while relatively small, represent important opportunities for energy efficiency and conservation. The importance of these energy savings is magnified by budget shortfalls in the K-12 schools sector. Table 1-1 summarizes this potential.

Table 1-1. Technical and Economic Potential for Energy and Demand in Elementary and Secondary Schools in California

	Technical Potential	Economic Potential
GWh	461.4	253.5
MW	119.3	48.8
Therms Millions)	45.6	5.2

Indoor lighting has the greatest kWh and kW savings potential, while water heating has the greatest therm savings potential.

1.5.2 Non-Energy Benefits

Although the kWh and therms consumed annually by elementary and secondary schools in the four IOU service territories are relatively small, one should not automatically assume that the *total* benefits are small. The assessment of non-energy benefits is critical to understanding the *full range* of benefits provided by school programs. They have a variety of uses:

- Benefit-cost analysis (using subsets or pieces of the NEB analysis)
- Marketing and targeting programs to provide maximum benefits and to ensure target groups receive sufficient benefits
- Marketing programs to appeal to participants based on the types of benefits they actually value.

While the scope of this market characterization did not allow a thorough analysis of non-energy benefits within the school market, we encourage those responsible for developing energy

efficiency programs for schools to more carefully document such benefits in future evaluations, since such benefits can be substantial.

1.5.3 Barriers

There are approximately 25 separate facilities or curriculum-based programs that promote energy efficient retrofits and curricula through the reduction of four key market barriers:

- Information and Search Costs
- Performance Uncertainty
- Organizational Practices
- High First Costs

1.5.4 California's Schools, Students, Staff, and Facilities

1.5.4.1 Districts and Schools

In the 2003-04 school year, there were 1,059 independent school districts in California with a total of 9,223 schools. PG&E has 683 school districts, accounting for nearly 65 percent of the school districts in California. In comparison, SoCalGas has 358 school districts, SCE has 249 school districts, and SDG&E has only 50 school districts[2].

1.5.4.2 Enrollment

While K-12 enrollment in California is expected to grow by four percent, there is considerable variation by county. There are 23 counties, scattered through the state, in which enrollment is expected to equal or exceed six percent. These higher than average growth rates (four percent) are projected for counties in the Central Valley, primarily served by PG&E, and for Riverside and San Bernardino counties, primarily served by SCE and SoCalGas. It is these counties in which school construction is expected to be the strongest over the next ten years. Areas where school enrollment is projected to drop include a number of rural counties in northern California as well as San Francisco and San Mateo counties in the Bay Area.

1.5.4.3 Racial and Ethnic Background

There are some differences in the distribution of racial and ethnic groups in the public schools for the four IOUs. The Hispanic or Latino group represents 57 percent of the population in schools served by SoCalGas, 46 percent for SCE, 38 percent for SDG&E, and only 34 percent for PG&E. The White, not Hispanic group represents only 25 percent of public school enrollment for SoCalGas, 37 percent for SCE, 40 percent for PG&E, and 43 percent for SDG&E. The population classified as Asian represents over 10 percent of PG&E school enrollment but no more than 6 percent for the other three IOUs. Such racial and ethnic diversity may have implications for those designing curriculum-based energy efficiency programs, particularly for the hard-to-reach population.

[2] Numbers do not add to 1,059 due to overlapping service territories, particularly between SCE and SoCalGas.

1.5.4.4 English Learners

All three IOUs serving Southern California have more than 20 percent of their school districts with more than 80 percent of students classified as English Learners. Such linguistic diversity has important implications for developing curriculum-based energy efficiency programs, particularly for the hard-to-reach population.

1.5.4.5 Teacher Experience

Teacher experience has been shown to be higher for higher performing schools. Teacher experience may also be an indicator of the willingness of individual teachers to incorporate innovative curricula into the classroom. There are many experienced elementary and secondary teachers, credentialed in the life sciences and physical sciences, who could probably take advantage of the energy curricula available throughout the state.

1.5.4.6 Availability and Use of School Technologies

Student access to computers and the Internet have implications for the development of energy efficiency related curriculum materials. Within California, 48 percent of the schools have a student-to-classroom-computer ratio of less than five. More than 80 percent of the schools have a student-to-classroom-computer ratio of less than ten. Clearly, there are a fair number of schools with ratios that could support computer-based instruction regarding energy efficiency and conservation. In addition, over 95 percent of the schools have some form of Internet access available for instructional purposes.

1.5.4.7 Facilities

The Office of Public School Construction (OPSC), the state agency that supports the State Allocation Board (SAB) in making funding available for modernizing and building safe and adequate school facilities, has reported a need for 35,110 additional classrooms by 2009. In addition, the OPSC reported a need to modernize another 46,243 classrooms by 2009. The State of California's share of costs for these improvements are projected to require funding of over $16 billion, including $12.13 billion for new construction and $3.95 billion for modernization projects.[3]

The use of portable classrooms has increased as a way of quickly addressing overcrowding. Currently, there are approximately 80,000 portable classrooms being used in California, representing nearly 30 percent of all classrooms. Twenty-eight percent of the portables are relatively old, having been manufactured prior to 1985, which because of their age pose greater health hazards. The use of portable classrooms is expected to grow, although the rate of growth has been difficult for policy makers to determine.

The present need for new schools and modernization of existing schools provides numerous opportunities for a wide variety of energy efficiency programs targeted to both new construction and modernization. These programs, if properly designed, have the potential to capture important energy savings and non-energy benefits that have relatively long useful lives.

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[3] California Department of Education, 2005b.

1.5.5 Funding

At the federal, state and local levels, there is a substantial amount of money remaining for new construction, modernization, and class size reduction. As of June 2004, the OPSC reported that $10.7 billion from all sources remained available for new applications. Over 99 percent of these funds are presently available under the School Facility Program. During the 2003-04 year, the OPSC reported processing applications that totaled close to $2 billion. If OPSC continues funding at the rate of $2 billion per year, the remaining funds would be available through 2008.

While there are other sources of funding, it was difficult to determine the actual amount. Program planners should investigate each of these other sources to determine funding availability.

Finally, if the America's Better Classroom Act of 2005 is passed by the 109th Congress, the financing aspects would be similar to the Qualified Zone Academy Bond (QZAB) program, but would promote construction of new schools. Additionally, there do not appear to be eligibility restrictions similar to those attached to the QZAB program if the America's Better Classroom Act l comes to fruition. If passed, the bill would provide $11 billion in 2006 and another $11 billion in 2007.

1.5.6 Curriculum- and Facility-Based School Programs

There are at least 25 curriculum- and facilities-based energy efficiency programs targeted to elementary and secondary schools in California. Such diversity has led to a wide range of innovative programs. However, the targeting and delivery of these programs to California schools has not, up until now, been well coordinated. There are, however, some opportunities for synergies achieved through improved collaboration and coordination that could increase the energy and non-energy benefits delivered to California schools.

1.5.7 School Management and Decision Making

Energy efficiency programs targeted at the schools market are concerned with two general categories of decisions, those made regarding curriculum and those regarding facilities. Below, we provide some very general guidance about how to approach school districts, depending upon the type of energy efficiency program one is promoting.

1.5.7.1 Facility Decisions

While the local government's role in controlling education funding decisions has diminished, it is still at the local level that the allocation of resources for education ultimately takes place. The local school district remains the basic administrative unit of schooling. And, despite increased federal and state regulations that have developed throughout the years, practical realities of daily government and the belief in local control of education have kept education a fundamentally local enterprise. Placing restrictions on use is always a matter of degree, and what really matters is how the restrictions affect behavior at the local level.

At the local level, there are five key decision-makers who are typically involved in planning educational facilities:

1. School board,

2. Chief administrator at the school (the principal),
3. Facility planner/operations manager,
4. Educational consultant
5. Architect/engineer

The extent to which energy efficiency programs targeted to schools engage these stakeholders and assist them in overcoming the various market barriers they face (described earlier in Section 1.5.3) will determine whether opportunities to invest in energy efficiency will be pursued.

2 Introduction

2.1 Background

The evaluation of Pacific Gas and Electric's (PG&E) PY 2003 Energenius Program and the PY 2003 School Resources Program is somewhat unusual. Traditionally, the evaluation of these two programs has focused on whether the programs achieved the level of participation stipulated in the Program Implementation Plans (PIP). In addition, past evaluations of these two programs have also addressed such issues as participant satisfaction, knowledge gained, and changes at the school site that could result in reductions in energy use.

As a consequence of changes in the design of the Energenius Program and the School Resources Program for PY 2004-05, a traditional evaluation of these two programs for PY 2003 was determined to have limited value. As a result, the evaluation of these two programs for PY 2003 was modified to include only the verification of their respective participation goals, with the remaining evaluation funds devoted to characterizing the school market segment. The verification of participation goals for these two programs was submitted to PG&E as a separate report.

Using publicly-available information, the market characterization report addresses school management and decision-making, market barriers to investing in energy efficient equipment and innovative curricula, the characteristics of elementary and secondary schools (K-12) in California, school finance and the availability and potential of energy efficiency programs available to the target market. The description of the elementary and secondary schools focuses on public schools and includes information on the numbers and types of schools, students, school personnel, availability of computers for instructional purposes, and school facilities. Where data permit, this information is provided for both California and the four major IOUs in California (see Appendix F for maps of the service territories of the four IOUs).

This market characterization represents an update and expansion of the ones prepared by Ridge and Sutter (2001) and Ridge, Sutter, and Jones (2003) under contract to PG&E. While there have been many changes in the last two to four years, the most significant have come in the areas of the estimated energy efficiency potential, school financing, school facilities, and the number energy efficiency programs targeted at the elementary and secondary schools sector.

2.1.1 Energy Efficiency Programs for Schools

In California, there are estimated to be at least 25 energy efficiency programs targeted at schools administered by utilities, state agencies, and third-party implementers. Some of these programs have a facilities focus, others have a curriculum focus, and still others have a combined focus. The school programs identified in this study are described more fully in Section 9.

Facilities programs are designed to implement both hardware and behavioral changes to reduce energy use and demand at the school site. These programs use various strategies that include energy audits, rebates, financing, and training. The benefits from facilities programs are relatively short-term and can be measured. There are three assumptions underlying the

development of facility programs, such as the School Resources Program (SRP). These assumptions are that:

- Schools are under-represented among the participants in traditional non-residential audit and rebate programs.
- The under-representation of schools is a result of somewhat unique market barriers operating in the schools sector that are not fully addressed by the traditional non-residential audit and rebate programs.
- School energy programs, such as the SRP, can serve to overcome these market barriers, leading to an increase in participation in the various non-residential audit and rebate programs.

Curriculum programs are designed to introduce curriculum materials about energy use, conservation, and energy efficiency into K-12 classrooms. The intermediate and long-range benefits of increased knowledge, changes in attitudes, and changes in behavior resulting from these programs can also be measured, but measuring the effect of these benefits on future reductions in energy use is somewhat more difficult. There are two assumptions underlying the development and implementation of curriculum programs, such as PG&E's Energenius Program (EP). These assumptions are that:

- Classroom science curricula in many schools ignore or under-emphasize energy use, conservation, and energy efficiency.
- Curricula materials that are focused on energy use, conservation, and energy efficiency and can be easily incorporated by teachers into their lesson plans will likely be used.

While this study could not verify that elementary and secondary schools are under-represented among the participants in utility-sponsored audit and rebate programs, the extent to which the barriers operating in the school market segment are unique is addressed. In addition, the study also addresses the extent of past participation in the various schools programs as an indication of the extent to which schools are likely to use classroom science curricula that emphasizes energy use, conservation, and energy efficiency.

2.1.2 Research Objectives

This report focuses on the market characterization of the school sector with the objective of informing the development and implementation of energy efficiency programs targeted for the school sector. Market characterization can generally be defined as an assessment of the structure and functioning of a market, the primary purpose of which is to understand how the market operates in order to be able to effectively change the way in which the market functions.[4] For energy efficiency programs for schools, the design and implementation of these programs can be improved if those who design and implement them understand the customers in the target market—the size and type of school district, projected school enrollment, languages spoken,

[4] Hall et al, 2004.

access to computers, the age and physical condition of the buildings, funds available for maintenance, modernization and new construction, the planning and budget cycles, and the decision-making processes at the state, district, and school levels.

The task of designing and implementing energy efficiency programs is particularly challenging since the schools segment participates in many markets such as commercial HVAC, lighting, and new construction, and is embedded in a very complex and competitive classroom curriculum market. The school segment market also involves multiple decision-makers at the state, district, and school levels; these decision-makers also operate in a highly charged political environment. In addition, the market barriers vary depending on whether one is focused on making changes in the physical plant or in the curriculum.

The design and implementation of energy efficiency programs is complicated even further by the fact that, while these school programs offer a wide variety of energy and educational services to California schools, these services appear to be only mildly coordinated. Certainly, utility-sponsored programs must operate within their respective service territories. However, federal, state, and third-party programs are able to operate throughout the state. To some extent, this produces a healthy competition among the various school programs, but the presence of multiple programs with overlapping geographic areas and objectives can be confusing to those involved in making decisions to participate in these programs and may result in unnecessary duplication of services.

This market characterization of the school sector includes a description of California's schools with respect to the following:

- School management and decision making
- Market barriers to investing in energy efficient equipment and innovative curricula
- Description of the elementary and secondary schools in California and in service territories of the four major IOUs where data permit, including information on
    - Number and types of public school districts, public schools and private schools
    - School enrollment
    - Race and ethnicity of public school students
    - Languages spoken by public school students classified as English Learners
    - School personnel at public schools, including teacher experience and student/teacher ratios
    - Availability of computers and Internet connections for instructional purposes at public schools

    - Public school facilities, including the need for new construction and modernization of facilities, as well as information on the mix of portable and traditional classrooms.

- Financing of public schools
- Current and forecasted role of energy efficiency
- The existing efficiency programs available for schools in PG&E's service territory and throughout California

2.2 Report Outline

The remainder of this report is divided into 9 sections:

- Methods
- Energy Efficiency Potential
- Non-Energy Benefits
- Barriers to Investing in Energy Efficient Equipment
- California's Schools, Students, Staff, and Facilities
- Public School Finances
- Current Energy Efficiency Programs
- School Management and Decision Making
- Conclusions and Recommendations

3 Methods

3.1 Overview

This market characterization report relies on the analysis of publicly available data for California's public and private schools in the four major IOU service territories. Also included in this section are the procedures followed and data sources used to characterize the school sector for California and the four major IOUs. Additional detail on the procedures used to develop IOU-specific information is provided in Appendix A.

3.2 Market Characterization for California's School Sector

The market characterization for the school sector for California and the four major investor-owned utilities (IOUs) includes information on the energy efficiency potential in the school sector, a discussion of potential barriers to adopting energy efficiency improvements in the school sector, and a profile of the school sector, both for California and for the specific IOUs where data permit. The four IOUs are Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SoCalGas). The profile of the school sector focuses primarily on the public school sector, although some information is provided on the private school sector.

At present, there is a substantial amount of public data available on certain topics for individual public school districts and public schools that can be used to characterize the school segment in California and in the service territories of specific IOUs. Data collected and made available annually for individual public schools and public school districts can be used to develop IOU-specific information on the number and types of school districts and schools, enrollment by school district and school, ethnicity of students, characteristics and experience of teachers and administrative staff, availability of computers and Internet connections, and school district revenues and expenditures. Data on the condition and other characteristics of public school facilities is somewhat more limited as is information for private schools. With respect to California's public school facilities, there is no centralized database maintained by the state on school facilities, although several studies have collected some information for the state on types of buildings and other characteristics of public school facilities.

3.2.1 Energy Efficiency Potential

For the sections on energy efficiency potential, the primary information sources are the two most recent commercial energy efficiency potential studies:

- Mike Rufo and Fred Coito. 2002. *California Statewide Commercial Sector Energy Efficiency Potential Study: Study ID #SW039A: Final Report. 1 and 2.* Prepared for the Pacific Gas & Electric Company by XENERGY Inc.

- Fred Coito and Mike Rufo. 2003. *California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study: Study ID #SW061: Final Report: Volumes 1 and 2.*

Prepared for the Pacific Gas & Electric Company by KEMA-XENERGY Inc., May 14, 2003 (Revised July 2003)

These studies identify the school sector as a separate commercial sector and include estimates of technical and economic potential by end use and utility.

3.2.2 Barriers to Investing in Energy Efficiency and Decision-Making Process

To describe the decision-making process and structure within the schools sector, we relied on a variety of sources, including:

- Hanson, E. Mark. *Educational Administration and Organizational Behavior*. Needham Heights, MA: Allyn and Bacon, 1996.
- Picus, Lawrence O. 2001. "Educational Governance in California: Defining State and Local Roles," in *School Finance and California's Master Plan for Education*, Jon Sonstelie and Peter Richardson, (eds.), San Francisco, CA: Public Policy Institute of California, pp. 9-27.

3.2.3 IOU-Specific Information

For this study, data for public schools with school district and school identifiers and, to the extent data are available, for private schools, were obtained from the California Department of Education (CDE) web site. Specific information on the data files used to develop IOU-specific information for public and private schools are listed in Appendix C. The data files developed for this report with specific IOU identifiers are available upon request.

Much of the information on public and private schools presented in Section 7 and Section 8 are based on data collected and made available annually by the CDE. For public schools and public school districts, data on the site, the type of school and school district, school enrollment, student characteristics, and personnel information are provided as part of the California Basic Educational Data System (CBEDS). These data are available in machine-readable files on the CDE website. Information on private schools made available by the CDE is collected using the Private School Affidavit. Expenditure and revenue information for public school districts is made available by the CDE using a relatively new accounting system known as the Standardized Account Structure (SACS).

As stated in CDE's *Fact Book 2005*,

> . . . the California Basic Educational Data System, otherwise known as CBEDS, is a system for collecting and sharing demographic data about students, schools, school districts, and classified and professional education staff in the California public school system in kindergarten through grade twelve. The data are collected once a year on a Wednesday in early October that is designated as 'Information Day'[5]

[5] California Department of Education, 2005a, p. 19.

As a general rule, IOU-specific data for the 2003-04 *fiscal year* or for the 2003-04 *school year* are used. These data were available by school district and school in May 2005 when the data for this study were being gathered. In addition, summary information for 2003-04 for California is available in the CDE's *Fact Book 2005*. For each table, the source and specific year for which data are presented are provided.

Information provided for California has been developed using the CBEDS data file and these results have been compared to results published in CDE's *Fact Book 2005* in a number of instances. The results do not always match but the differences are minor. These differences may reflect differences in definitions and in how missing information has been handled. As noted in the tables, when information is available for California from CDE's *Fact Book 2005*, this information is used. The procedures followed in preparing the CBEDS data for this report are discussed further in Appendix E.

Information on public school expenditures and revenues has been developed from the unaudited financial data for fiscal year 2003-04 available on the CDE website in May 2005. These data are reported to the CDE using the Standardized Account Structure (SACS) and are made available using a Microsoft Access database. Further discussion of the procedures followed in developing information using the SACS files is provided in Appendix E.

3.2.4 Additional Information on Public Schools in California

A number of excellent studies and reports are available on the characteristics of students, teachers, and other personnel, on the public school finance system, and on the various challenges facing California public schools. These studies and reports are listed in Appendix C and are referred to where appropriate in the text. A recent and particularly useful study is:

- Carroll, Stephen J., Cathy Krop, Jeremy Arkes, Peter A. Morrison, and Ann Flanagan, 2004, *California's K–12 Public Schools: How Are They Doing?* Prepared for the William and Flora Hewlett Foundation.

Other valuable sources are available, including reports prepared by California's Department of Education, EdSource, and the Public Policy Institute of California.

4 Energy Efficiency Potential

Estimates of the energy efficiency potential for elementary and secondary schools are available from the California Statewide Commercial Sector Energy Efficiency Potential Study[6] and the California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study.[7] These two studies provide a number of conceptually different potential estimates, including both technical potential and economic potential. These two distinctly different concepts of potential are defined as:

> ***Technical potential*** is usually defined as the *complete* penetration of all measures analyzed in applications where they were deemed *technically* feasible from an *engineering* perspective.
>
> ***Economic potential*** is typically used to refer to the *technical potential* of those energy conservation measures that were cost-effective when compared to supply-side alternatives. Economic potential takes into account the fact that many energy-efficiency measures cost more to purchase initially than do their standard-efficiency counterparts. The incremental costs of each efficiency measure are compared to the savings delivered by the measure to produce estimates of energy savings per unit of additional cost. These estimates of energy-efficiency resource costs can then be compared to estimates of other resources such as building and operating new power plants.[8]

4.1.1 Energy and Demand Potential

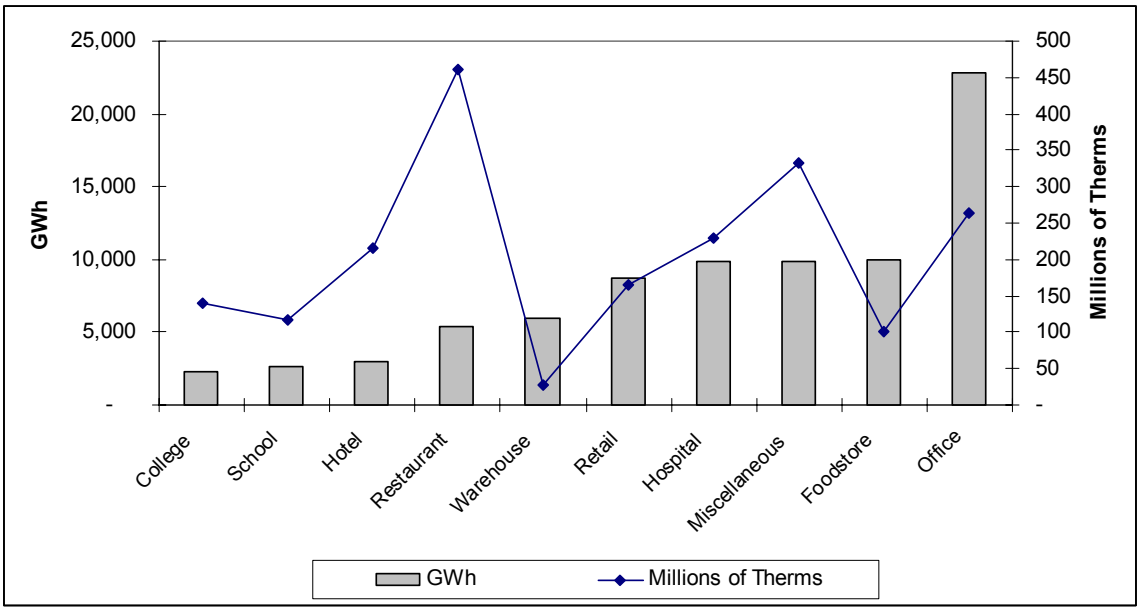
The kWh and therms consumed annually by elementary and secondary schools in the four IOU service territories, while relatively small, represent important opportunities for energy efficiency and conservation. Figure 4-1 presents the GWh and therms used in 2000 for each building type. As one can see, elementary and secondary schools consume relatively little energy. With respect to electricity use in the four service territories, elementary and secondary schools are estimated to consume annually approximately 2,595 GWh or 3.2 percent of the total commercial energy use. In the four service territories, the total therms used annually by schools are estimated to be 117 million therms, which is approximately 5.6 percent of all commercial therms used.

[6] Rufo and Coito, 2002

[7] Coito and Rufo, 2003

[8] Rufo and Coito, 2002, pp. 1-4 to 1-5

Figure 4-1. Annual GWh and Therm Used in 2000, by Building Type



The energy, demand, and natural gas potential by key end uses for the elementary and secondary schools sector for each of the four major investor-owned utilities (IOUs) are presented in Table 4-1, Table 4-2, and Table 4-3. For each electric end use, the total energy usage (GWh) or demand (MW), along with the technical and economic potential as a percentage of this usage or demand are presented. For gas end-use, the total gas usage in millions of therms (Mth), along with the technical and economic potential as a percentage of this usage are presented.

With respect to energy usage, the end use with the greatest technical and economic potential across all three electric utilities is indoor lighting. For these three utilities, the end use with the second highest potential is outdoor lighting. The total technical and economic potential across all utilities is 461.4 GWh and 253.5 GWh, respectively. For demand, the end use with the greatest technical and economic potential across all three electric utilities is indoor lighting. For all utilities, the end use with the second highest potential is cooling. The total technical and economic potential across all four utilities is 119.3 MW and 48.8 MW, respectively.

Estimates of technical and economic potential are also provided for the three major natural gas utilities – PG&E, SoCalGas and SDG&E. Of the four end uses considered, water heating and pool heating are the two end uses with the greatest potential natural gas savings. The total technical and economic potential across all three utilities is 45.6 million therms and 5.2 million therms, respectively.

Table 4-1. GWh Used, Technical Potential and Economic Potential by End Use for California's Major Investor-Owned Electric Utilities

Utility	End Use	Total GWh	Technical Potential	Economic Potential
PG&E	Cooling	26.9	20.6%	12.3%
	Indoor Lighting	493.8	24.9%	5.0%
	Outdoor Lighting	50.0	15.4%	14.0%
	Office Equipment	21.5	51.4%	22.7%
	Refrigeration	25.9	0.0%	0.0%
	Ventilation	79.5	2.3%	0.3%
	Other	150.1	0.0%	0.0%
SCE	Cooling	174.0	18.9%	11.4%
	Indoor Lighting	545.6	28.2%	16.5%
	Outdoor Lighting	207.9	15.6%	15.4%
	Office Equipment	21.8	47.1%	20.1%
	Refrigeration	104.2	0.0%	0.0%
	Ventilation	146.6	11.1%	11.1%
	Other	104.2	0.0%	0.0%
SDG&E	Cooling	47.6	14.9%	8.9%
	Indoor Lighting	121.8	38.8%	29.4%
	Outdoor Lighting	50.1	13.5%	13.1%
	Office Equipment	4.5	47.1%	20.1%
	Refrigeration	3.9	0.0%	0.0%
	Ventilation	43.3	7.8%	7.8%
	Other	58.1	0.0%	0.0%

Source: From Appendix K of the *California Statewide Commercial Sector Energy Efficiency Potential Study: Study ID #SW039A: Final Report*. Prepared for the Pacific Gas & Electric Company by Mike Rufo and Fred Coito, 2002.

Table 4-2. MW Demand, Technical Potential and Economic Potential by End Use for California's Major Investor-Owned Electric Utilities

Utility	End Use	Total MW	Technical Potential	Economic Potential
PG&E	Cooling	27.6	19.6%	11.4%
	Indoor Lighting	106.4	36.5%	5.5%
	Outdoor Lighting	0.3	7.9%	7.2%
	Office Equipment	3.3	25.3%	13.1%
	Refrigeration	3.7	0.0%	0.0%
	Ventilation	18.4	2.3%	0.3%
	Other	22.6	0.0%	0.0%
SCE	Cooling	117.7	17.1%	9.5%
	Indoor Lighting	95.0	38.3%	17.7%
	Outdoor Lighting	0.6	8.1%	8.0%
	Office Equipment	3.4	25.3%	12.4%
	Refrigeration	12.7	0.0%	0.0%
	Ventilation	31.6	4.9%	4.9%
	Other	12.7	0.0%	0.0%
SDG&E	Cooling	32.2	13.6%	7.6%
	Indoor Lighting	21.2	46.8%	30.3%
	Outdoor Lighting	0.1	5.9%	5.6%
	Office Equipment	0.7	25.3%	12.4%
	Refrigeration	0.5	0.0%	0.0%
	Ventilation	9.3	3.4%	3.4%
	Other	7.1	0.0%	0.0%

Source: From Appendix K of the *California Statewide Commercial Sector Energy Efficiency Potential Study: Study ID #SW039A: Final Report*. Prepared for the Pacific Gas & Electric Company by Mike Rufo and Fred Coito, 2002.

Table 4-3. Natural Gas Used, Technical Potential and Economic Potential by End Use for California's Major Investor-Owned Natural Gas Utilities

Utility	End Use	Total Mth	Technical Potential	Economic Potential
PG&E	Heating	40.77	28.6%	1.0%
	Water Heating	28.91	43.3%	8.0%
	Cooking	4.45	38.3%	0.0%
	Pool Heating	6.20	39.0%	12.2%
SDG&E	Heating	4.16	29.9%	0.0%
	Water Heating	3.46	44.3%	7.7%
	Cooking	1.11	38.3%	0.0%
	Pool Heating	0.68	44.8%	12.5%
SoCalGas	Heating	16.50	29.6%	0.0%
	Water Heating	13.73	44.3%	7.7%
	Cooking	4.41	38.3%	0.0%
	Pool Heating	2.70	43.6%	12.5%

Source: From Appendix G of the *California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study: Study ID #SW061: Final Report: Volume 1 of 2.* Prepared for the Pacific Gas & Electric Company by Fred Coito and Mike Rufo. 2003

5 Non-Energy Benefits

In what ways does a school facility either enhance or inhibit student performance? And what implications do new educational strategies related to education reform have on how schools should be designed? As school facilities become a more pressing issue — in California and nationally — researchers, policymakers, and school planners are addressing the extent to which facilities directly affect student achievement, health, and safety.

Research evidence and common sense both indicate that there is a minimum level of quality for a school facility below which student and teacher effectiveness can be seriously compromised. A variety of studies conducted since 1982 throughout the United States indicate that students achieve less in school buildings that are situated on noisy streets, are overcrowded, or are not adequately and safely maintained.[9] While the energy potential in schools is significant, these other benefits, often referred to as non-energy benefits (NEBs) (even though not all the so-called benefits are positive) are equally, if not more, significant. These benefits include the level of comfort, maintenance costs, academic performance, teacher productivity, indoor air quality, effects on student and teacher health and a host of other impacts. Note that NEBs do not include only those benefits that are hard to measure, and include factors that relate to positive and negative impacts from other aspects of equipment (e.g., maintenance, labor savings, etc.) – excluding energy savings.

The established convention is to separate the types of impacts into three main types of net non-energy benefits, based on who is the beneficiary[10]:

- **Utility/agency benefits** – things that benefit or affect ratepayers and utility and reduce revenue requirement – for example lower bad debt because of lower arrearages, lower line losses, power quality issues, and reduced labor cost from fewer bill-collection-related calls. These are generally valued at utility (marginal) costs.

- **Societal benefits** – things that benefit or affect the greater society or that cannot be attributed directly to utility/ratepayers (above) or participants (below). These include emissions/environmental/health, direct and indirect economic multipliers, water system benefits (a need for fewer treatment plants, etc.), or similar things. These are valued as appropriate to the benefit category.

- **Participant benefits** – things that benefit or affect the participants, in addition to energy savings. This includes a wide variety of factors shown below, depending

[9] California Air Resources Board and California Department of Health Service (ARB/DHS), 2004; Heschong Mahone Group, 1999; Oakes, 2003; Ross and Walker, 1999; Sexton et al, 1989; McHugh et al., 2004.

[10] Skumatz, 1997.

upon whether the participants are residential or non-residential customers. These benefits are valued in terms relevant to the participant.

For the utility, typical categories of benefits include transmission and distribution savings (usually distribution only), lower capital upgrades on substations, increased power quality and reliability. For society, typical categories of benefits include economic benefits – direct and indirect multipliers, emissions/environmental (trading values and/or health/hazard benefits), health and safety equipment, and water and waste-water treatment or supply plants. For participants, the list includes:

- Water/wastewater bill savings
- Equipment maintenance (labor and cost)
- Equipment lifetime
- Aesthetics/appearance
- Fires/insurance damage (from gas-related audits/fix)
- Indoor air quality
- Illnesses and lost days from work/school
- Comfort
- Noise
- Safety
- Lighting/quality of light
- Academic performance
- Operating costs (non-energy)[11]
- Equipment performance (push air better, etc.)
- Teacher productivity

Note that several benefits arise in multiple categories. Replacement of inefficient and difficult to maintain HVAC equipment by efficient and easily maintained HVAC equipment is likely to reduce labor costs for equipment maintenance, improve indoor air quality, reduce illnesses and lost days from work or school, improve comfort, reduce

[11] Sometimes omitted if likely to double count with benefits listed under equipment performance and teacher productivity.

noise levels in classrooms, and improve academic performance and teacher productivity. Including and placing a value on all of these benefits is not double-counting benefits – rather, including all of these benefits recognizes that some equipment and behavioral changes have multiple beneficiaries and each should be valued using an appropriately tailored valuation method.

The assessment of these benefits is critical to understanding the full range of benefits provided by school programs. They have a variety of uses:

- Benefit-cost analysis (using subsets or pieces of the NEB analysis)
- Marketing and targeting programs to provide maximum benefits and to ensure target groups receive sufficient benefits
- Marketing programs to appeal to participants based on the types of benefits that they actually value.

While the scope of this market characterization did not allow an analysis of non-energy benefits within the school market, we encourage those responsible for developing energy efficiency programs for schools to more carefully document such benefits in future evaluations.

With respect to benefit-cost analysis, the New York State Energy Research and Development Authority (NYSERDA) has for the past two years incorporated participant and societal NEBs into its version of the Total Resource Cost (TRC) Test, which is called the Total Market Effects Test (TMET)[12]. The addition of the participant NEBs, valued in terms of avoided costs, increased the TMET by approximately 46 percent. While participant NEBs are currently not included in calculating TRCs in California, these NEBs are nevertheless substantial and would, if allowed, substantially improve the TRCs for such programs.[13]

[12] Heschong Mahone Group et al., 2004; Heschong Mahone Group et al., 2005.

[13] Utility NEBs and the full range of societal NEBS are currently not included in calculating the TRC in California. In California, environmental benefits, a subset of the societal benefits, are currently included in the form of environmental adders. However, economic benefits are not included. This contrasts with NYSERDA, which includes a full range of economic benefits; it does not include any environmental benefits.

6 Barriers to Investing in Energy Efficient Equipment

One key element in any market characterization is the identification of probable market barriers that might impede the adoption of the efficiency products. For reference purposes, the generic barriers, along with descriptions presented in a recent scoping study on energy efficiency, are presented in Table 6.1.[14] Following this table, the most significant market barriers facing the schools sector are presented[15],[16]. These market barriers are couched in terms of those defined in Table 6-1.

Table 6-1. Market Barrier Descriptions

Barrier	Description
Information or Search Costs	The costs of identifying energy-efficient products or services or of learning about energy-efficient practices, including the value of time spent finding out about or locating a product or service or hiring someone else to do so.
Performance Uncertainties	The difficulties consumers face in evaluating claims about future benefits. Closely related to high search costs, in that acquiring the information needed to evaluate claims regarding future performance is rarely costless.
Asymmetric Information and Opportunism	The tendency of sellers of energy-efficient products or services to have more or better information about their offerings than do consumers, which, combined with potential incentives to mislead, can lead to sub-optimal purchasing behavior.
Hassle or Transaction Costs	The indirect costs of acquiring energy efficiency, including the time, materials and labor involved in obtaining or contracting for an energy-efficient product or service. (Distinct from search costs in that it refers to what happens once a product has been located.)
Hidden Costs	Unexpected costs associated with reliance on or operation of energy-efficient products or services - for example, extra operating and maintenance costs.
Access to Financing	The difficulties associated with the lending industry's historic inability to account for the unique features of loans for energy savings products (i.e., that future reductions in utility bills increase the borrower's ability to repay a loan) in underwriting procedures.
Bounded Rationality	The behavior of an individual during the decision-making process that either seems to be or actually is inconsistent with the individual's goals.

[14] Eto et al., 1996.

[15] Eley Associates, 2001.

[16] Mills et al., 2001.

Table 6-1 (continued). Market Barrier Descriptions

Barrier	Description
Organization Practices or Customs	Organizational behavior or systems of practice that discourage or inhibit cost-effective energy-efficiency decisions - for example, procurement rules that make it difficult to act on energy-efficiency decisions based on economic merit.
Misplaced or Split Incentives	Cases in which the incentives of an agent charged with purchasing energy efficiency are not aligned with those of the persons who would benefit from the purchase.
Product or Service Unavailability	The failure of manufacturers, distributors or vendors to make a product or service available in a given area or market. May result from collusion, bounded rationality, or supply constraints.
Externalities	Costs that are associated with transactions, but which are not reflected in the price paid in the transaction.
Non-Externality Pricing	Factors other than externalities that move prices away from marginal cost. An example arises when utility commodity prices are set using ratemaking practices based on average costs (rather than marginal).
Inseparability of Product Features	The difficulties consumers sometimes face in acquiring desirable energy-efficiency features in products without also acquiring (and paying for) additional undesired features that increase the total cost of the product beyond what the consumer is willing to pay.
Irreversibility	The difficulty of reversing a purchase decision in light of new information that may become available, which may deter the initial purchase - for example, if energy prices decline, one cannot resell insulation that has been blown into a wall.

Source: Eto, et al., 1996.

6.1 Specific Barriers Facing Schools

6.1.1 Information and Search Costs

The information and search cost market barrier is primarily due to a lack of awareness of the value of energy efficiency. This lack of awareness is tied to the low interest in energy efficiency in this sector arising from the fact that energy costs in a given school are such a low percentage (2 percent) of overall operating costs.

In the schools market, school districts often neither have access to the technical expertise required to conduct energy audits and the engineering modeling needed to estimate nor the time or expertise required to interpret savings. They also do not have information about high performance schools benefits, cost effectiveness, and process information. As a result, districts do not know what to ask for when shopping for new equipment or architectural designs. In addition, those who design schools (architects and engineers) often lack the information and training to design high performance schools with respect to energy usage.

6.1.2 Performance Uncertainty

In the schools, there is little enthusiasm for adopting the more efficient technologies, since they are uncertain about their performance. Put another way, there is a fear of being first to market.

6.1.3 Organizational Practices

In the schools market, those making purchasing and maintenance decisions may have little practice in incorporating efficient technologies in educational or building specifications, since they have traditionally opted only for standard equipment and designs. Decision-makers have usually focused on the first costs rather than considering the stream of future benefits in the form of reduced energy bills. In addition, the current budgetary process does not allow sufficient time to examine all the energy efficient equipment and design options, making the use of standard equipment and building designs, and convenient rules-of-thumb the norm.

Another organizational practice that poses a significant barrier is the tight timeline imposed by the state funding system. Under Senate Bill 50 (SB 50), state funding was allocated on a first come, first served basis. School districts were forced to rush to complete their plans to acquire their share of the limited funds. Anything that slowed the process, such as paying attention to energy efficiency, healthy materials, and indoor air quality, was often lost in the rush.[17]

6.1.4 High First Costs

While not technically a market barrier, declines in school funding over the last 20 years have left little or no room in school budgets for incorporating high performance measures. While the effects of Proposition 1A in 1998, Proposition 47 in November 2002, and Proposition 55 in March 2004 may help, much more money is needed before schools will seriously consider the more energy efficient options.

[17] Mills et al., 2003.

7 California's Schools, Students, Staff, and Facilities

California's schools include both public and private schools. For the 2003-04 school year, there were over 1,000 public school districts with nearly 10,000 schools and an enrollment of slightly less than 6.3 million. In comparison, there were approximately 3,700 private schools with an enrollment of nearly 600,000 students, or 9 percent of the school-age population in California.[18]

Public schools are the responsibility of locally elected school boards. The school boards approve budgets and set priorities for the local district. However, school boards make these decisions within a system that is firmly overseen by the state legislature and governor with the support of various state agencies. This complex system ("chaotic" and "splintered", according to some critics) governs school curriculums, the certification of teachers, the allocation of state funds and local property taxes, and the apportionment of bond revenues for new construction and building renovations.[19] The state agencies with responsibilities for this system include the California Board of Education, the Superintendent of Public School Instruction, the California Department of Education (CDE), the State Allocation Board (SAB), and the Office of Public School Construction (OPSC).

Private schools are governed by both religious-based and secular organizations. There are limited requirements imposed by the state on private schools through the Education Code, including the requirement that each private school with 6 or more students file a Private School Affidavit each year. The Affidavit requires the reporting of organizational information (e.g., governance structure) as well as information on school enrollments and numbers of teachers. The Education Code also provides an exemption from compulsory public school attendance for students attending a private, full-time day school, as long as certain conditions are met, including the recording of school attendance.[20] The limited information collected by the CDE from California's private schools also explains the focus of this report on public schools.

For California, the schools and students attending them are a reflection of the state's size and diversity. The level of public school enrollment in the 2003-04 school year, by county, is presented in Figure 7-1. Counties with enrollments exceeding 100,000 include 7 counties in the southern part of the state as well as counties in the Bay Area and the Central Valley. In contrast, there are a number of counties in the northern and eastern part of the state with public school enrollments of less than 10,000. Differences in public school enrollment by county reflect both differences in the density of populations as well as differences in the number of square miles covered by the county.

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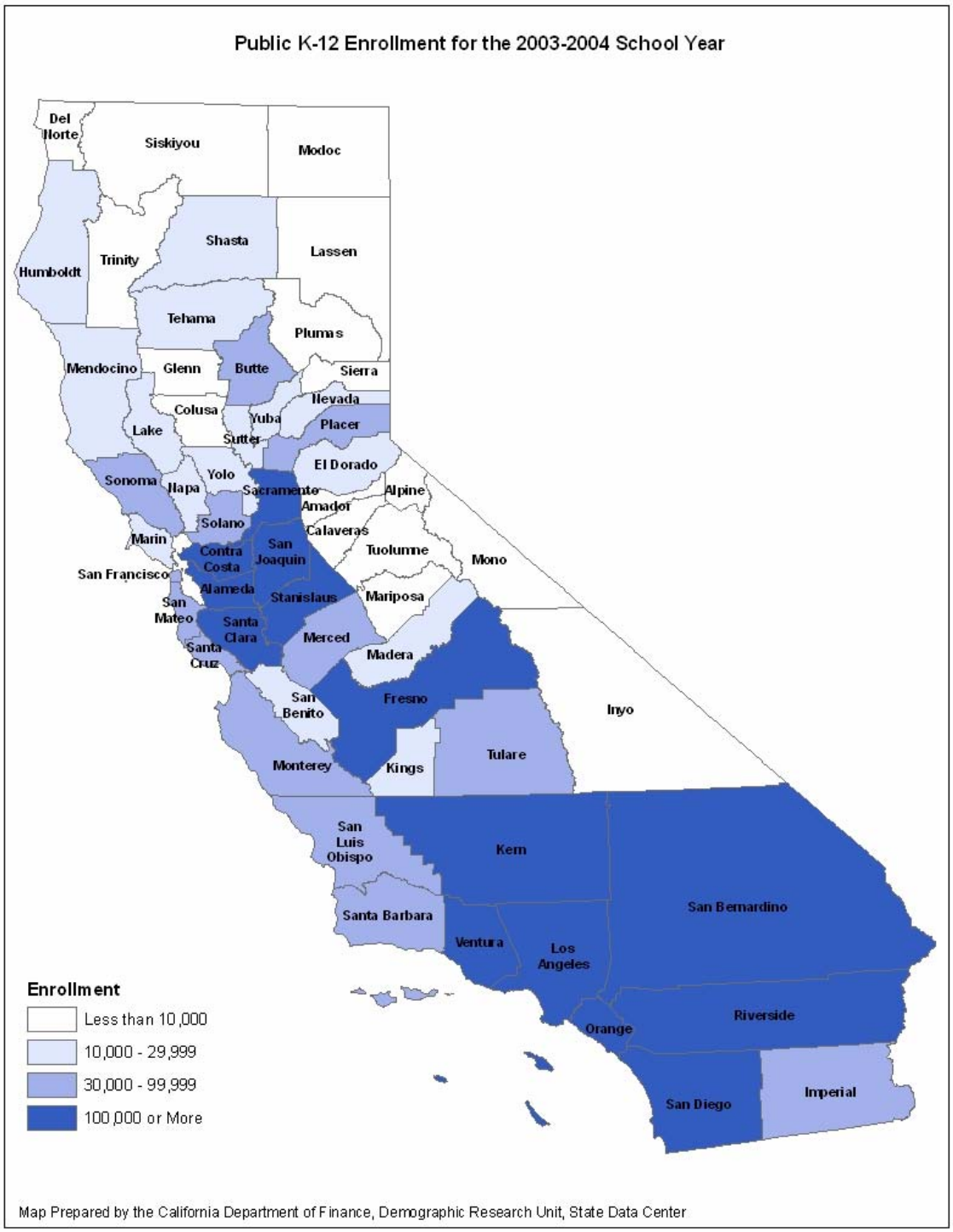
[18] See California Department of Education, 2005a, pp. 8, 126. Reports public school enrollment of 6,298,774 students and private school enrollment of 599,605.

[19] EdSource, 2004b, Oakes, Jeannie, 2002, pp. 43-58 (reference to "chaotic state educational policy system" on p. 55); Picus, Lawrence O., 2001 (reference to "splintered governance structure" on p. 9).

[20] For a brief introduction to requirements governing private schools in California, see California Department of Education, 2005.

Figure 7-1. Public K-12 Enrollment for the 2003-2004 School Year



Source: State of California, Department of Finance, 2004b.

California's public school districts range in size from single school districts serving a rural population with fewer than 50 students to some of the largest urban school districts in the country. The Los Angeles Unified School District has an enrollment of 747,000 and accounts for over 11 percent of California's public school enrollment; other large school districts with enrollments exceeding 80,000 include San Diego City Unified (138,000), Long Beach Unified (98,000), and Fresno Unified (81,000).[21]

Students attending California's schools are diverse in terms of their racial and ethnic backgrounds, their ability to speak English, and the economic needs of their families. Moreover, the schools these students attend include some of the most up-to-date and thoughtfully designed facilities in the United States, while others are antiquated with inadequate wiring, deteriorating plumbing, and inefficient lighting and HVAC systems.

There are a number of excellent studies and reports available that focus on California's schools.[22] Some of these studies and reports provide background information on the characteristics of the schools and those attending and working at them. Others focus on specific issues such as English Learners and teacher certification, while still others document, and in certain instances advocate, the need for specific changes.

The purpose of this section of the report is not to summarize or replicate the information found in these studies and reports but to provide a profile of the schools in California and in the service territories of the four major IOUs when data permit. Most of the information found in this report is for public schools since only limited information is available for all private schools. Information is provided for each of the four major IOUs in California on the types and size of public school districts and schools and on the characteristics of the students and staff at these schools. IOU-specific information is also provided on the availability of computers and Internet connections for instructional purposes.

Given the relevance of school facilities on the marketing of energy efficiency, a discussion is also included on the characteristics and quality of existing school facilities and the need both for major refurbishments of existing facilities and the construction of new facilities. As will be discussed in that section, there is more than sufficient information available to support statements that some of the schools in California are in deplorable condition and either need to be modernized or replaced. Other schools are overcrowded, requiring the addition of classrooms and teachers. Despite the extent of case histories on the condition of California's school facilities, the state has not maintained an up-to-date and accurate inventory of school facilities by school district or school that would allow the development of information for each of the four major IOUs. The California Department of Health Services (DHS) did conduct a census of school facilities in 2000-01, collecting information on the number and age of both traditional and portable classrooms.[23]

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[21] California Department of Education, *2005 Fact Book* 2005, p. 22.

[22] A list of references is provided as part of this report. Some examples of excellent studies include Betts et al., 2000: California Department of Education, 2005a; State of California, State Allocation Board, 2001; Carroll et al, 2005 ("RAND Report"); Edsource, 2004; Jepson, 2005; Oakes, 2002; Sonstelie and Richardson, 2001.

[23] California Department of Health Services. 2003.

7.1 Public School Districts, Public Schools and Enrollment

As indicated in Table 4-1, there were 1,059 independent school districts in California in the 2003-04 school year. School districts are generally classified by the grade level of the students served and are commonly classified as elementary, high school, unified districts and other. The "other" category includes county offices of education, joint power authorities, and various other types of school districts. The majority of the school districts (562 or 53 percent) in California are elementary districts, generally serving either kindergarten through 6th grade (K-6), or kindergarten through 8th grade (K-8). The next most common type of school district is the unified school district, which accounted for 329 districts or 31 percent of the school districts in California. These districts serve both elementary and high school students (K-12) and generally have the highest enrollments.

PG&E has 683 school districts in its service territory, accounting for nearly 65 percent of the school districts in California. In comparison, SoCalGas has 358 school districts, SCE has 249, and SDG&E has only 50. There are some minor variations in the distribution of school districts by type across the four IOUs. The percentage of elementary schools ranges from 56 percent for PG&E to only 49 percent for SDG&E. SDG&E has a larger percentage of high school districts (14 percent) than the other three IOUs where fewer than 10 percent of the districts are high school districts. The percentage of unified school districts also varies some with the percentage ranging from 28 percent for PG&E to over 37 percent for SDG&E.

Table 7-1. Number of Public School Districts, 2003-04: California and Four Major IOUs

Type of District	California*	PG&E	SCE	SDG&E	SoCalGas
Number					
Elementary	567	380	126	24	176
High	94	55	22	7	28
Unified	328	192	87	17	134
Other**	70	56	14	2	20
Total	1059	683	249	50	358
Percent					
Elementary	53.5%	55.6%	50.6%	48.0%	49.2%
High	8.9%	8.1%	8.8%	14.0%	7.8%
Unified	31.0%	28.1%	34.9%	34.0%	37.4%
Other	6.6%	8.2%	5.6%	4.0%	5.6%
Total	6.6%	8.2%	5.6%	4.0%	100.0%

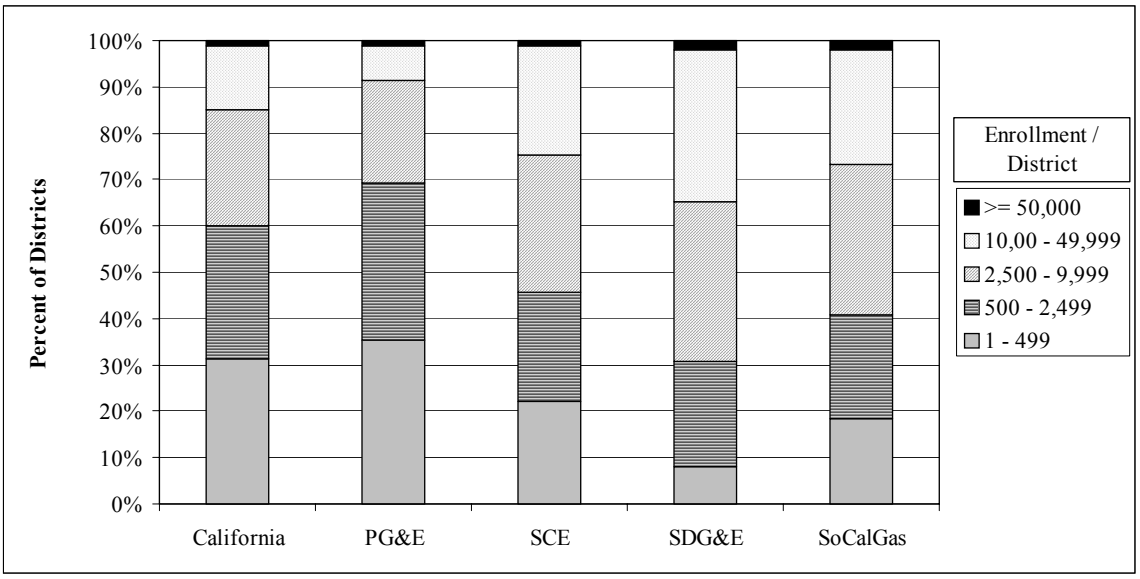
* Number of school districts is for California and is not equal to the sum of school districts listed for each of the IOUs due to overlap of service districts and the fact that parts of California are not in the service districts of the four major IOUs

** Other includes County Offices of Education, Joint Power Authority, State Board of Education Charter School, schools at non-school locations.

Source: California Department of Education, 2005, Fact Book 2005, pp. 8, 2 for California values. California Department of Education, CBEDS data file for 2003-2004 for IOU-specific information.

In addition to variations by type of school district, there are also substantial differences in the size of public school districts as measured by school enrollment both in California and across the four major IOUs. As indicated in Figure 7-1, over 30 percent of the districts in California have enrollments of less than 500 students. This percentage is slightly higher for PG&E and somewhat lower for the other three IOUs. Similarly, approximately 15 percent of the districts in California have enrollments greater than 10,000 students. This percentage is less than 10 percent for PG&E and somewhat higher for the other three IOUs.

Figure 7-2. Percentage of Public School Districts by Enrollment, 2003-04: California and Four Major IOUs



Source: California Department of Education, CBEDS data for 2003-04.

For the 2003-04 school year, the 1,059 school districts had a total of 9,223 schools. The CDE provides information on a variety of school types with the most common being elementary schools, high schools, and middle (and junior high). Elementary schools generally serve Kindergarten through 5th grade (K-5), Kindergarten through 6th grade (K-6) or Kindergarten through 8th grade (K-8).[24] Middle schools (or junior) commonly serve the grade span of 7th and 8th grade, while high schools generally serve the grade span of 9th to 12th. For given purposes, the CDE has very specific rules on how to classify a school by type. There are a number of other school types, including alternative schools, community day schools, continuation schools, and K-12 schools.

Information on the number of schools and enrollment by primary type of school for California and the major IOUs is presented in Table 7-2 and Table 7-3. Information on the numbers and enrollment for other types of schools are presented in Table 7-4.

As indicated in Table 7-2, the average school enrollment in California for 2003-04 was 683 students. The average enrollment does vary by school type with elementary schools having an average enrollment of 572, middle schools an average enrollment of 964 students, and high schools an average enrollment of 1,606. Average enrollment does vary by IOU with the average enrollment in all school types ranging from a low of 534 for PG&E's service territory to a high of 853 for SoCalGas. These differences are also reflected in the average enrollment by school type.

[24] California Department of Education, 2005a, p. 20.

Table 7-2. Number of Public Schools, Enrollment, and Average Enrollment, 2003-04: California and Four Major IOUs

	California*	PG&E	SCE	SDG&E	SoCalGas
Schools					
Elementary	5503	2567	1255	461	2453
Middle	1235	580	291	100	549
High	1059	529	235	85	417
Other**	1426	809	272	87	467
Total	9223	4485	2053	733	3886
Enrollment					
Elementary	3,146,620	1,204,308	796,010	281,968	1,667,065
Middle	1,190,867	432,182	298,790	110,702	645,862
High	1,700,913	652,972	438,348	158,467	883,016
Other**	260,374	106,077	65,751	18,629	118,409
Total	6,298,774	2,395,539	1,598,899	569,766	3,314,352
Average Enrollment					
Elementary	572	469	634	612	680
Middle	964	745	1,027	1,107	1,176
High	1,606	1,234	1,865	1,864	2,118
Other**	183	131	242	214	254
Total	683	534	779	777	853

* Number of schools is for California and is not equal to the sum of schools for each of the IOUs due to overlap of service districts and the fact that parts of California are not in the service districts of the four major IOUs

** Other includes Alternative, County Community, Community Day, Continuation, California Youth Auhority (CYA), Juvenile Hall, K-12, Opportunity, Special Educaiton, State Special.

Source: California Department of Education, 2005, Fact Book 2005, p. 8 for number of schools and p. 21 for enrollment. California Department of Education, CBEDS data file for 2003-2004 for IOU-specific information.

The number and percentage of schools and school enrollment for the major types of schools are presented in Table 7-3. Reflecting the differences in average enrollment across type of school, approximately 60 percent of the schools in California are elementary schools while only 50 percent of the students attending public schools attend an elementary school. In comparison, approximately 12 percent of the schools in California are high schools while 27 percent of the students attend a high school. For the four IOUs, there are only minor differences in the distribution of schools and enrollment by school type.

Table 7-3. Public Schools and Public School Enrollment, 2003-04: California and Four Major IOUs

	California*	PG&E	SCE	SDG&E	SoCalGas
Number of Schools					
Elementary	5503	2567	1255	461	2453
Middle	1235	580	291	100	549
High	1059	529	235	85	417
Other**	1426	809	272	87	467
Total	9223	4485	2053	733	3886
Percent of Schools					
Elementary	59.7%	57.2%	61.1%	62.9%	63.1%
Middle	13.4%	12.9%	14.2%	13.6%	14.1%
High	11.5%	11.8%	11.4%	11.6%	10.7%
Other**	15.5%	18.0%	13.2%	11.9%	12.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
School Enrollment					
Elementary	3,146,620	1,204,308	796,010	281,968	1,667,065
Middle	1,190,867	432,182	298,790	110,702	645,862
High	1,700,913	652,972	438,348	158,467	883,016
Other**	260,374	106,077	65,751	18,629	118,409
Total	6,298,774	2,395,539	1,598,899	569,766	3,314,352
Percent of School Enrollment					
Elementary	50.0%	50.3%	49.8%	49.5%	50.3%
Middle	18.9%	18.0%	18.7%	19.4%	19.5%
High	27.0%	27.3%	27.4%	27.8%	26.6%
Other**	4.1%	4.4%	4.1%	3.3%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

* Number of schools is for California and is not equal to the sum of schools for each of the IOUs.
** Other includes Alternative, County Community, Community Day, Continuation, California Youth Auhority (CYA), Juvenile Hall, K-12, Opportunity, Special Educaiton, State Special.
Source: California Department of Education, 2005, Fact Book 2005, pp. 8, 2 for California values. California Department of Education, CBEDS data file for 2003-2004 for IOU-specific information.

In addition to the three major types of schools noted above, there are a number of other types of schools for which the CDE reports information. The various types commonly classified as "Other" are listed in Table 7-4 along with information on the number of schools and enrollment. For California, the most common types of schools classified as "Other" are Alternative, Community Day, Continuation, and Specification Education schools. These four types of

schools account for nearly 85 percent (1,201 divided by 1,420) of the schools listed as "Other" and nearly 65 percent (167,743 divided by 258,546) of the students enrolled in the various types of schools classified as "Other."

Table 7-4. Number and Enrollment of "Other" Public Schools by Type, 2003-04: California and Four Major IOUs

	California	PG&E	SCE	SDG&E	SoCalGas
Schools					
Alternative	240	136	50	21	81
County Community	41	29	7	1	7
Community Day	318	199	50	14	75
Continuation	518	287	109	23	205
CYA	13	9	2	0	4
Juvenile Hall	54	37	10	1	11
K-12	96	50	21	12	27
Opportunity	12	3	1	1	7
Special Ed	125	57	22	14	49
State Special	3	2	0	0	1
Total	1420	809	272	87	467
Enrollment					
Alternative	60,229	23,493	13,278	4,502	31,476
County Community	16,522	7,674	7,344	1,410	2,947
Community Day	9,888	3,076	2,971	754	5,977
Continuation	68,025	28,581	19,250	4,115	34,907
CYA	3,306	1,887	707	0	1,419
Juvenile Hall	13,664	5,047	3,235	1,254	6,695
K-12	54,589	22,703	13,209	5,275	18,526
Opportunity	1,802	792	50	168	830
Special Ed	29,601	12,337	5,707	1,151	15,199
State Special	920	487	0	0	433
Total	258,546	106,077	65,751	18,629	118,409

Note: Values for California are not equal to values reported in California Department of Education, Fact Book 2005, pp. 8, 21.
Source: California Department of Education, CBEDS 2003-04.

7.2 Private Schools and Enrollment

At present, information is collected by the CDE for private schools with enrollments of six or more students. In 2003-04 year, 8.7 percent of the students enrolled in California schools were enrolled in private schools. As reported by the CDE in *Fact Book 2005*, this enrollment percentage has decreased slightly over the past ten years from 9.8 percent in 1993-94.[25] There

[25] California Department of Education, 2005a, p. 126.

are also substantial variations in the percentages of students enrolled in private schools across counties with San Francisco (29.1 percent), Marin (18.7 percent), and San Mateo (15.4 percent) being among the counties with above average percentages. For a number of rural counties, less than five percent of students are enrolled in private schools. These variations may reflect the quality of public schools in particular areas but undoubtedly reflect the availability of private schools as well.[26] The number and enrollment of private schools follow a similar pattern by IOU service territory, as shown in Table 7-5.

Table 7-5. Number and Enrollment for Private Schools, 2003-04: California and Four IOUs

Type of School	California*	PG&E	SCE	SDG&E	SoCalGas
Number	3,751	1,489	903	323	1,879
Enrollment (N)					
Kindergarten	58,338	21,022	14,602	5,492	31,491
Grades 1-8	391,936	145,641	92,967	36,307	205,184
Grades 9-12	149,331	57,284	29,752	12,541	77,190
Total	599,605	223,947	137,321	54,340	313,865
Enrollment (%)					
Kindergarten	9.7%	9.4%	10.6%	10.1%	10.0%
Grades 1-8	65.4%	65.0%	67.7%	66.8%	65.4%
Grades 9-12	24.9%	25.6%	21.7%	23.1%	24.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

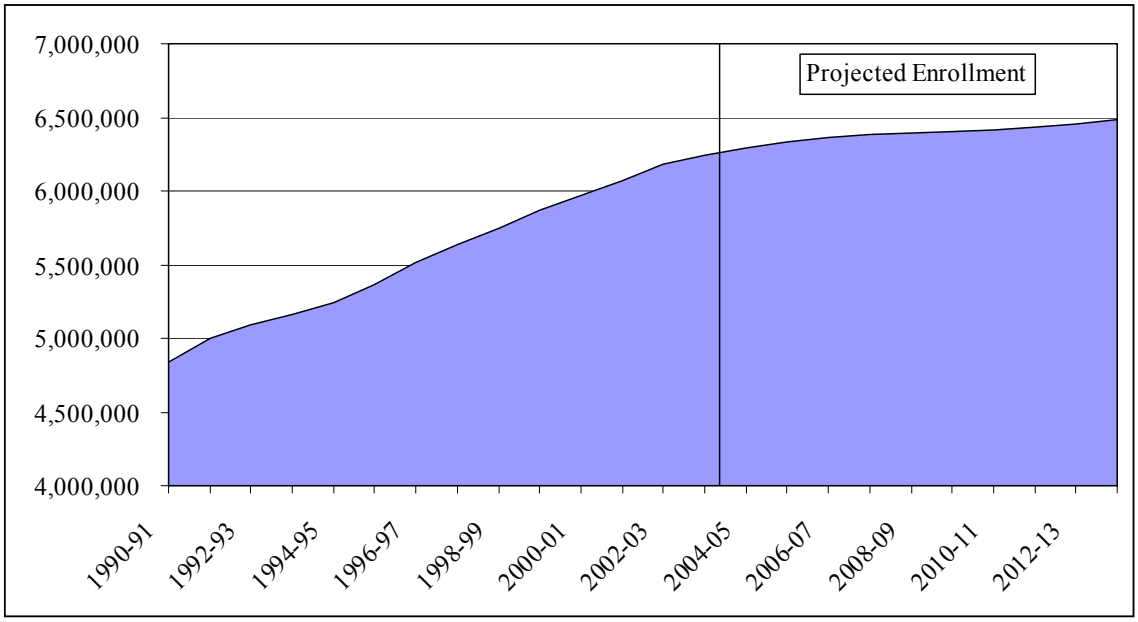
Source: California Department of Education, 2004, Enrollment and Staff in California Private Schools, pp. 4, 8 for values for California. For IOU-specific information see Appendix C.

7.3 Projected Enrollment

According to projections of public school enrollment prepared by California's Department of Finance (DOF), the growth rate of public school enrollment is expected to decrease over the next ten years as compared to the previous ten years. However, this projected lower growth rate amounts to an increase of approximately 250,000 students, or 4 percent. The historical and forecasted K-12 public school enrollment for the period 1990-91 through 2012-13 is plotted in Figure 7-3.

[26] California Department of Education, 2004b, pp. 1, 11-12.

Figure 7-3. Projected Enrollment in Public Schools, 1990-01 through 2012-13: California



Source: State of California, Department of Finance, 2004.

Although projections by school district necessary to develop IOU-specific information are not readily available, public school enrollment projections are available by county. In Table 7-6, county growth rates for public school enrollment for the period 2003-04 through 2012-13 are presented. Counties are listed in order of school enrollment. Counties with projected growth rates of 6 percent or more are highlighted in green.

While K-12 enrollment in California is expected to grow by four percent, there is considerable variation in the projected growth rates by county. Higher than average growth rates (greater than 4 percent) are projected for several counties in the Central Valley, primarily served by PG&E, and for Riverside and San Bernardino counties, primarily served by SCE and SoCalGas. Areas where school enrollment is projected to drop include a number of rural counties in northern California as well as San Francisco and San Mateo counties in the Bay Area. The counties with above average growth rates are expected to require a number of new schools and classrooms. However, due to the condition of existing school facilities, the extent to which existing schools are overcrowded, and changes in the distribution of the school age population throughout the county, counties with lower than average growth rates may also require both new classrooms and the replacement or modernization of existing school facilities.

Table 7-6. K-12 Enrollment and Growth Rate by County, 2003-04 through 2013-14

County	Enrollment 2003-04	Enrollment 2013-2014	Growth Rate
ALPINE	148	172	16%
SIERRA	669	614	-8%
TRINITY	2,101	1,870	-11%
MONO	2,231	2,397	7%
MODOC	2,298	1,853	-19%
MARIPOSA	2,530	2,433	-4%
PLUMAS	3,156	3,130	-1%
INYO	3,265	2,840	-13%
COLUSA	4,384	4,839	10%
AMADOR	4,802	4,999	4%
DEL NORTE	5,434	4,873	-10%
GLENN	6,061	5,870	-3%
LASSEN	6,174	6,101	-1%
CALAVERAS	6,825	6,882	1%
SISKIYOU	6,850	6,427	-6%
TUOLUMNE	7,601	7,142	-6%
LAKE	10,359	11,061	7%
TEHAMA	11,051	11,874	7%
SAN BENITO	11,631	12,812	10%
MENDOCINO	14,569	13,848	-5%
YUBA	14,755	17,052	16%
NEVADA	15,060	16,185	7%
SUTTER	16,976	19,304	14%
NAPA	19,705	21,026	7%
HUMBOLDT	20,113	18,307	-9%
KINGS	26,494	29,614	12%
MADERA	27,149	32,577	20%
MARIN	28,418	27,787	-2%
EL DORADO	28,917	29,463	2%
YOLO	29,272	33,557	15%
SHASTA	29,561	28,735	-3%
BUTTE	33,646	32,787	-3%
IMPERIAL	34,858	39,913	15%
SAN LUIS OBISPO	36,455	35,663	-2%
SANTA CRUZ	39,032	36,007	-8%
MERCED	54,415	61,366	13%
SAN FRANCISCO	59,410	54,956	-7%
PLACER	61,663	86,118	40%
SANTA BARBARA	67,517	67,225	0%
SOLANO	71,702	73,199	2%
SONOMA	72,737	74,057	2%
MONTEREY	73,162	77,783	6%
SAN MATEO	88,321	82,894	-6%
TULARE	89,829	101,796	13%
STANISLAUS	103,922	118,649	14%
SAN JOAQUIN	130,349	163,339	25%
VENTURA	144,715	148,594	3%
KERN	159,507	180,825	13%
CONTRA COSTA	163,679	176,725	8%
FRESNO	190,423	206,607	8%
ALAMEDA	215,627	218,416	1%
SACRAMENTO	234,716	272,365	16%
SANTA CLARA	249,209	250,034	0%
RIVERSIDE	362,102	468,752	29%
SAN BERNARDINO	417,449	472,853	13%
SAN DIEGO	497,582	504,172	1%
ORANGE	513,267	502,128	-2%
LOS ANGELES	1,704,208	1,593,694	-6%
CALIFORNIA	**6,238,061**	**6,486,561**	**4%**

Source: State of California, Department of Finance, 2004b.

7.4 Public School Students

7.4.1 Racial and Ethnic Background

By all reports, California has one of the most diverse populations in the United States in terms of racial and ethnic background. As would be expected, the racial and ethnic background of public school students reflects this diversity. Among California's public school students, the dominant racial and ethnic group identified is "Hispanic or Latino" with this group representing 46 percent of the enrollment in public schools (Table 7-7). "White non-Hispanic" represents 33 percent of the public school enrollment, with other racial and ethnic groups each representing less than 10 percent of the public school enrollment. Although information is not available by subcategories of "Hispanic or Latino", this subgroup is also quite diverse, including students from a number of distinctly different countries and cultures.

Based on information from California's Department of Finance (DOF), the percentage of Hispanic or Latino students in California's public schools has increased from 34 percent in 1990-91 to 46 percent in 2003-04.[27] These percentages are projected to continue to increase with 54 percent of public school enrollment projected to be Hispanic or Latino in 2013-14.

As indicated in Table 7-19, there are some differences in the distribution of racial and ethnic groups in the public schools for the four IOUs. The Hispanic or Latino group represents 57 percent of the population in schools served by SoCalGas, 46 percent for SCE, 38 percent for SDG&E, and only 34 percent for PG&E. The White, not Hispanic group represents only 25 percent of public school enrollment for SoCalGas, 37 percent for SCE, 40 percent for PG&E, and 43 percent for SDG&E. The population classified as Asian presents over 10 percent of PG&E school enrollment but no more than 6 percent for the other three IOUs.

In making comparisons regarding the racial and ethnic background of students over time or across IOUs, one should be aware that some of the observed changes are likely to be a result of changes in the methods used to collect the information and in social norms. For this coming year, the racial and ethnic categories have been modified to reflect new federal standards. In addition, according to the directions provided to school administrators, each student is to be reported under one specific racial or ethnic designation and that designation is supposed to reflect the "...the individual's recognition in the community."[28] There is little question that the ethnic and racial categories presented and the instructions given to administrators will influence the data recorded, the only question is by how much. Present rules require administrators to classify a student who is of European heritage but speaks Spanish at home as either "Hispanic or Latino" or as "White, not Hispanic." These rules also assume that children who are from a mixed-race family are not recognized in the community as mixed race but instead as one racial or ethnic group. Allowing administrators to select multiple racial and ethnic designations for students may well change since, at present, certificated staff are allowed to report one or more racial or ethnic designation(s).

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[27] State of California, Department of Finance, 2004.

[28] California Department of Education, 2005d, p. 10.

Table 7-7. Race and Ethnicity of Public School Students, 2003-04:California and Four Major IOUs

	California*	PG&E	SCE	SDG&E	SoCalGas
Number					
African American, not Hispanic	510,201	192,492	105,347	39,405	275,546
American Indian/Alaska Native	50,390	29,392	11,806	5,160	15,688
Asian	503,902	252,463	95,525	29,129	192,418
Filipino	157,469	72,841	26,401	25,755	62,201
Hispanic or Latino	2,897,436	819,407	737,228	216,506	1,880,778
Pacific Islander	37,793	40,934	28,359	6,670	37,238
White, not Hispanic	2,049,621	19,429	7,053	4,620	14,557
Multiple/No Response	90,702	968,581	587,180	242,521	835,926
Total	6,297,514	2,395,539	1,598,899	569,766	3,314,352
Percent					
African American, not Hispanic	8.1%	8.0%	6.6%	6.9%	8.3%
American Indian/Alaska Native	0.8%	1.2%	0.7%	0.9%	0.5%
Asian	8.0%	10.5%	6.0%	5.1%	5.8%
Filipino	2.5%	3.0%	1.7%	4.5%	1.9%
Hispanic or Latino	46.0%	34.2%	46.1%	38.0%	56.7%
Pacific Islander	0.6%	1.7%	1.8%	1.2%	1.1%
White, not Hispanic	32.5%	0.8%	0.4%	0.8%	0.4%
Multiple/No Response	1.4%	40.4%	36.7%	42.6%	25.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: California Department of Education, 2005, Fact Book 2005, p. 8; California Department of Education, CBEDS data for 2003-04.

7.4.2 English Learners

The race and ethnicity of students within the public school system provide some indication of potential cultural differences among students. There is also substantial evidence that students other than White, non-Hispanic are more likely to attend schools that lack critical instructional resources (e.g., textbooks), have fewer qualified teachers, and where the facilities are overcrowded and in need of modernization.[29] However, race and ethnicity are distinctly different concepts from language proficiency. As a result, while suggestive, the race and ethnicity identification does not indicate how many students are classified as having a limited

[29] See Oakes, Jeannie, 2002.

command of the English language and may benefit from information, including energy efficiency curricula, in a language other than English.

Within California, information is available on the number of students classified by the CDE as "English Learners" (EL) by school and school district. The CDE defines an English Learner as:

> … those students for whom there is a report of a primary language other than English on the state-approved Home Language Survey and who, on the basis of the state approved oral language (grades kindergarten through twelve) assessment procedures and literacy (grades three through twelve only), have been determined to lack the clearly defined English language skills of listening comprehension, speaking, reading, and writing necessary to succeed in the school's regular instructional programs.[30]

How students are classified as English Learners and what is required for the students to be reclassified is somewhat complex.[31] School districts are given substantial latitude as to how to proceed with classification and reclassification. The California Board of Education suggests that school districts use a combination of English proficiency scores on the standardized test known as the California English Language Development Test (CELDT) as well as academic achievement, teacher evaluations, and parental consultation.

In addition to the lack of consistency regarding the classification of students as English Learners, there are a number of other explanations for variations in the number of English Learners by school district and school. For example, the population of students entering school with limited English skills may vary, the school may have limited resources with which to assist the child in becoming English proficient, and the school may not have resources available to administer the standardized CELDT required to reclassify the student. While there are additional explanations as well, these three are provided to illustrate the complexity of the classification and reclassification process.

As indicated in Table 7-21, over 25 percent of the public school students in California were classified as English Learners in the 2003-04 school year. There are some variations across the four IOUs with the number of English Learners for SoCalGas being 29 percent, substantially higher than the percentages reported for the other three IOUs.

[30] California Department of Education, 2005e.

[31] For a comprehensive study exploring the English Learner issue for California schools see Jepson and de Alth, 2005.

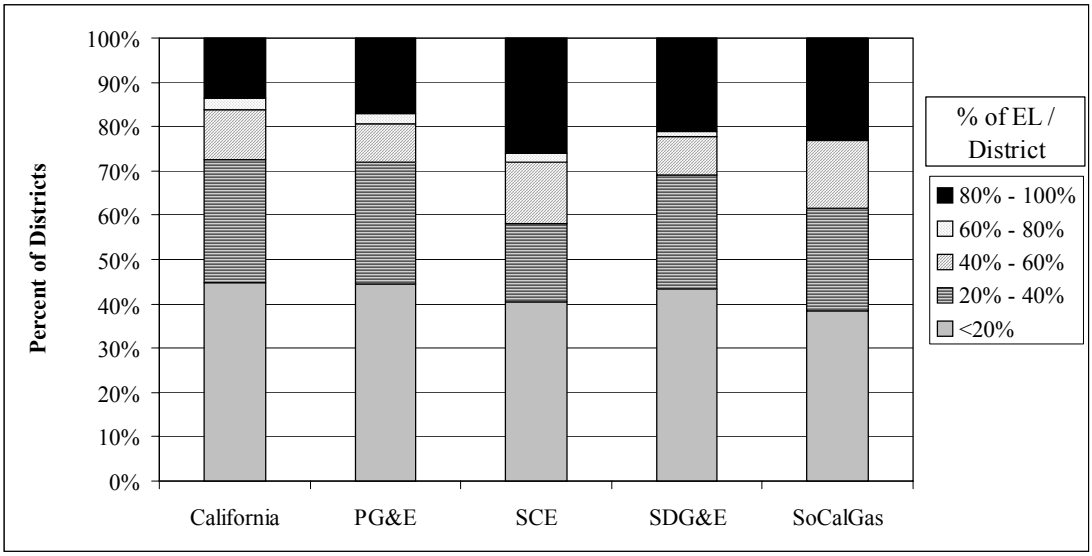
Table 7-8. English Learners in Public Schools, 2003-04: California and Four Major IOUs

	California*	PG&E	SCE	SDG&E	SoCalGas
Number					
English Learners	1,598,535	493,063	353,980	124,945	974,037
Total	6,268,774	2,395,539	1,598,899	569,766	3,314,352
Percent					
English Learners	25.5%	20.6%	22.1%	21.9%	29.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: California Department of Education, 2005, Fact Book 2005, p. 75 for California; California Department of Education, CBEDS data for 2003-04 for IOU-specific information

There is substantial variation in the number of English Learners in individual school districts throughout California. As illustrated in Figure 7-4, more than 10 percent of the school districts in California have more than 80 percent of their students classified as English Learners. This percentage varies by IOU service territory with SCE having the most school districts with 80 percent or more of the students classified as English Learners. However, all three IOUs serving Southern California were found to have more than 20 percent of the school districts with more than 80 percent of the students classified as English Learners.

Figure 7-4. Percentage of School Districts by Percentage of English Learner Students, 2003-04: California and Four Major IOUs



Source: California Department of Education, Language Census, 2003-04.

Students classified as English Learners in California's public schools speak over 50 languages. As indicated in Table 7-9, Spanish is by far the predominant language of English Learners for both California and the four IOUs. For California, over 21 percent of students enrolled in public schools are classified as English Learners with Spanish as the primary language. This represents 85 percent of the English Learners in California. However, while Spanish is the predominant language among English Learners in California's schools, there are a number of other languages spoken as the primary language. These include Vietnamese, Hmong, Cantonese, Pilipino (Tagalog and Filipino), Korean, and Khmer (Cambodian). There are also a number of schools where one of these languages is the predominant language among English Learners.

Table 7-9. English Learners by Top Five Languages Spoken, 2003-04: California and Four Major IOUs

	California*	PG&E	SCE	SDG&E	SoCalGas
Number					
Arabic	7,556	-	1,947	903	-
Armenian	10,660	-	-	-	9,929
Cantonese	22,867	14,069	-	-	-
Farsi	5,650	-	-	890	-
Filipino	20,895	9,846	2,307	2,914	8,149
Hmong	23,423	22,207	-	-	-
Korean	17,132	-	4,807	-	11,215
Spanish	1,359,792	368,612	317,902	108,182	889,073
Vietnamese	34,444	14,724	11,948	2,466	11,423
Other	96,116	63,605	15,069	9,590	44,248
Total	1,598,535	493,063	353,980	124,945	974,037
Percent					
Arabic	0.5%	-	0.6%	0.7%	-
Armenian	0.7%	-	-	-	1.0%
Cantonese	1.4%	2.9%	-	-	-
Farsi	0.4%	-	-	0.7%	-
Filipino	1.3%	2.0%	0.7%	2.3%	0.8%
Hmong	1.5%	4.5%	-	-	-
Korean	1.1%	-	1.4%	-	1.2%
Spanish	85.1%	74.8%	89.8%	86.6%	91.3%
Vietnamese	2.2%	3.0%	3.4%	2.0%	1.2%
Other	6.0%	12.9%	4.3%	7.7%	4.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: California Department of Education, 2005, Fact Book 2005, p. 75 for California; California Department of Education, Language Census for IOU-specific information.

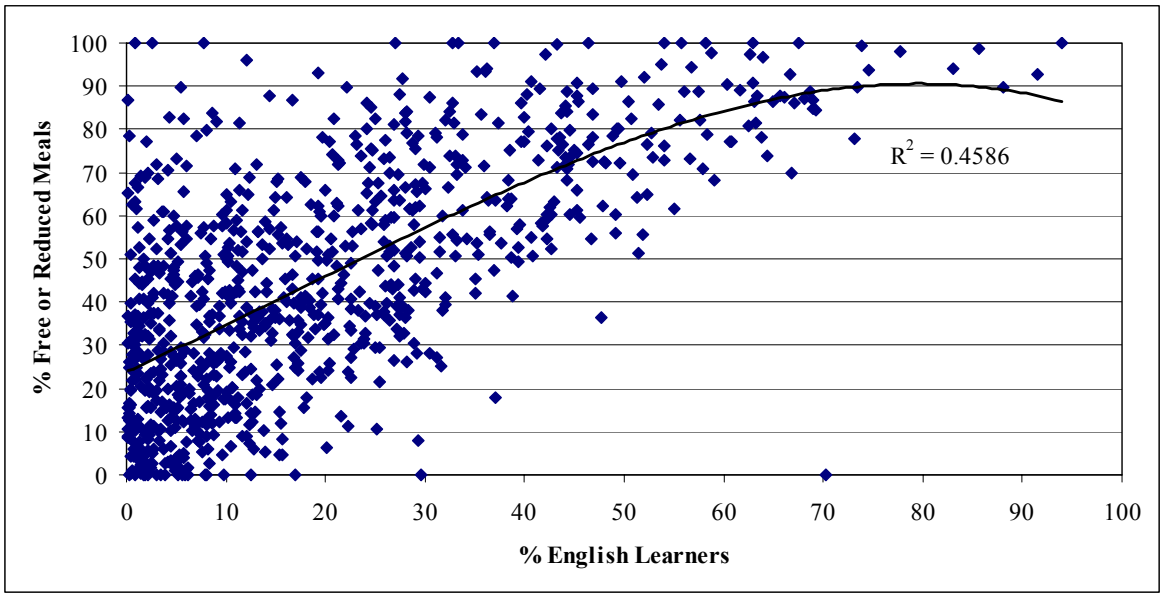
7.4.3 Free or Reduced Meals

As has been widely documented, poverty is closely related to lower student performance and, as a consequence, the performance of schools. One of the commonly used measures of student

poverty is participation in free and reduced-price meal programs offered in schools. While there are exceptions, comparisons of the percentage of students in free or reduced-price lunch programs are closely related to academic performance for elementary, middle, and high schools.[32] As noted below, there is also a close relationship between participation in free or reduced meals programs by school district and the percentage of English Learners.

In 2003-04, approximately 50 percent of the students in California were eligible to participate in the National School Lunch Program.[33] As noted in Figure 7.6, school districts with a high percentage of English Learners with few (if any) exceptions have a high percentage of students eligible as well as participating in free and reduced meal programs. This relationship is similar across all IOU service territories.[34] However, in California and in each of the four major IOUs, there are a number of school districts with more than 50 percent of their students participating in the free and reduced meal programs with fewer than 10 percent of their students classified as English Learners.

Figure 7-5. Percentage of Participation in Free and Reduced Meal Programs and Percentage of English Learners by School District, 2003-04: California



Source: Ed-data, 2005.

[32] Heather Rose et al., 2003, pp. 71-74.

[33] California Department of Education, 2005f.

[34] Separate charts for each of the four IOUs were reviewed but have not been included because there were only minor differences in the relationship between percentage of English Learners and percentage of participation in free and reduced-price meal programs among the four IOUs.

7.5 Teachers, Administrative Staff and Other School Personnel

In 2003-04, the California public school system employed approximately 600,000 individuals. This includes "certificated staff" and "classified employees." Employees classified as certificated staff are required to have a state-approved certification and include teachers, pupil services and administrators. Pupil services personnel provide direct services to students but are not teachers; this category of school personnel includes social workers, medical professionals (e.g., occupational therapists, physical therapists, speech therapists, etc.), librarians, counselors, special education specialists, and psychologists. Classified employees are not required to have a state-approved certification and include instructional aides in the classroom, business managers, school secretaries, bus drivers, and custodians.

As indicated in Table 7-9, in 2003-04, the California public school system employed close to 300,000 certificated full-time equivalent (FTE) teachers, for an average of 21 enrolled students per teacher. In addition to certificated teachers, there were also over 23,000 administrators and over 22,000 professionals classified under pupil services. For the four major IOUs, there are only minor differences in the ratios of enrollment per FTE for these three staff categories. This is not unexpected given the restrictions on the number of administrators and pupil services personnel allowed by the Education Code.

Table 7-10. Full-Time Equivalent (FTE) Certificated Staff for Public Schools, 2003-04: California and Four Major IOUs

	California	PG&E	SCE	SDG&E	SoCalGas
Full Time Equivalent (FTE)					
Administrators	23,427	10,216	6,336	2,129	13,318
Certificated Teachers	297,434	127,691	87,092	30,547	167,212
Pupil Services	22,204	9,585	5,965	2,412	12,454
Pupils per FTE					
Administrators	269	234	252	268	249
Certificated Teachers	21	19	18	19	20
Pupil Services	284	250	268	236	266

Source: California Department of Education, CBEDS for 2003-04.

Teacher experience has been shown to be higher for higher performance schools. Teacher experience may also be an indicator of the willingness of individual teachers to incorporate innovative curricula into the classroom. In Table 7-11, the actual number of teachers (not FTEs as shown in Table 7-10) and average number of years teaching are presented for all teachers, credentialed elementary teachers, credentialed secondary teachers, and credentialed life science and/or physical science secondary teachers, a subset of credentialed secondary teachers.

The teachers in California's public school districts have taught an average of 13.4 years. Both in California and in the service areas of the four IOUs, the average number of years of teaching experience is higher for secondary teachers as compared to elementary teachers, with the difference ranging from 1.7 years for SoCalGas to 1.2 years for PG&E. There are only small differences between the average years of teaching experience for all credentialed secondary teachers as compared to the subset of life science and/or physical science secondary teachers.

Table 7-11. Number of Teachers and Teaching Experience, 2003-04: California and Four Major IOUs

	California	PG&E	SCE	SDG&E	SoCalGas
Number (part time and full time)					
All Teachers	349,729	141,214	83,266	32,508	176,670
Credentialed Elementary	205,562	82,614	49,712	18,791	104,848
Credentialed Secondary	120,898	56,201	32,059	12,845	52,453
Credentialed Secondary - Life Science/Physical Science	17,869	8,574	4,677	1,915	7,440
Average Number of Years Teaching					
All Teachers	13.4	13.8	13.5	13.4	13.1
Credentialed Elementary	13.4	13.8	13.4	13.1	13.1
Credentialed Secondary	14.9	15.0	14.7	14.6	14.8
Credentialed Secondary - Life Science/Physical Science	14.7	14.9	14.7	14.2	14.4
Standard Deviation of Years Teaching					
All Teachers	10.2	10.2	10.1	9.9	10.2
Credentialed Elementary	9.9	9.9	9.8	9.5	10.0
Credentialed Secondary	10.7	10.5	10.6	10.0	10.9
Credentialed Secondary - Life Science/Physical Science	10.3	10.3	10.3	9.6	10.5

Source: California Department of Education, Staff Characteristics by Record Identification

As indicated by the average years teaching, there are many experienced teachers who could take advantage of the energy curricula available throughout the state. Additional information on years teaching for teachers who are likely to use energy curricula (i.e., elementary teachers and secondary teachers who are credentialed in the life sciences and physical sciences) is presented in Table 7-12. For California, nearly 80 percent of the elementary teachers have five or more years of teaching experience with nearly 40 percent having over 15 years of teaching experience. For secondary teachers credentialed in the life sciences and physical sciences, slightly more than 80 percent have five or more years of experience with nearly 45 percent having over 15 years of experience. The distribution of teachers by years of experience is similar across the four IOUs.

Table 7-12. Credentialed Teachers by Years Teaching, 2003-04: California and Four Major IOUs

	California	PG&E	SCE	SDG&E	SoCalGas
Number of Elementary Teachers					
0-4.9 Yrs	42,175	16,106	9,482	3,907	21,828
5-14.9 Yrs	84,780	32,807	21,264	7,768	44,941
>= 15 Yrs	78,607	33,701	18,966	7,116	38,079
Total	205,562	82,614	49,712	18,791	104,848
Number of Secondary Teachers - Life Science and Physical Science					
0-4.9 Yrs	3,407	1,549	879	345	1,494
5-14.9 Yrs	6,491	3,126	1,674	720	2,740
>= 15 Yrs	7,971	3,899	2,124	850	3,206
Total	17,869	8,574	4,677	1,915	7,440
Percent of Elementary Teachers					
0-4.9 Yrs	20.5%	19.5%	19.1%	20.8%	20.8%
5-14.9 Yrs	41.2%	39.7%	42.8%	41.3%	42.9%
>= 15 Yrs	38.2%	40.8%	38.2%	37.9%	36.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Secondary Teachers - Life Science and Physical Science					
0-4.9 Yrs	19.1%	18.1%	18.8%	18.0%	20.1%
5-14.9 Yrs	36.3%	36.5%	35.8%	37.6%	36.8%
>= 15 Yrs	44.6%	45.5%	45.4%	44.4%	43.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: California Department of Education, CBEDS for 2003-04.

7.6 Availability and Use of School Technologies

Increasingly, computers and Internet access have become available for instructional purposes throughout the United States.[35] In California's public schools in 2003, the ratio of students to computers was 5.0 and the ratio of students to Internet connected computers was 6.0. These ratios tended to be higher for high schools as compared to elementary and middle schools. In addition, there is some evidence that the availability of computers and access to the Internet

[35] Parsad, B. and J. Jones. 2005.

tends to decrease as the percentage of students eligible for subsidized lunch programs increases, although the differences do not appear to be that significant an issue. At this time, attention is increasingly being directed to the need for technical and curriculum support in order to allow for the integration of computer technologies into daily classroom activities.[36]

As indicated in Table 7-13, comparisons of computer access as indicated by enrollment to computer ratios, by school, across IOUs suggests that PG&E's service area has slightly more computers per student than the other three IOUs. Nearly 54 percent of the schools in the PG&E service territory reported a student to computer ratio of less than 4.9., while only 43 percent of the schools in the SCE territory and 42 percent of the schools in the SoCalGas territory reported student to computer ratio of less than 4.9. Over 95 percent of the schools in California and in the service territories of the four IOUs also have some form of Internet access available for instructional purposes.

[36] California Department of Education. California Technology Assistance Project. 2003.

Table 7-13. Computer and Internet Access at Public Schools, 2003-04: California and Four Major IOUs

	California*	PG&E	SCE	SDG&E	SoCalGas
Number of Schools by Student/Computer Ratio					
< 4.9	3879	1926	875	372	1625
5 - 9.9	3322	1311	889	280	1748
10 - 14.9	570	228	184	38	308
15 - 29.9	269	101	73	28	135
>30	49	20	9	6	24
Total	8089	3586	2030	724	3840
Percent of Schools by Student/Computer Ratio					
< 4.9	48.0%	53.7%	43.1%	51.4%	42.3%
5 - 9.9	41.1%	36.6%	43.8%	38.7%	45.5%
10 - 14.9	7.0%	6.4%	9.1%	5.2%	8.0%
15 - 29.9	3.3%	2.8%	3.6%	3.9%	3.5%
>30	0.6%	0.6%	0.4%	0.8%	0.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Average Student/Computer Ratio	6.3	5.8	6.6	6.4	6.7
Schools w/Internet Access	7,863	3,487	1,995	713	3,721
Percent of Schools w/Internet Access	97.2%	97.2%	98.3%	98.5%	96.9%

Note: Data for schools reporting information on computers and internet access.

Source: California Department of Edcuation, CBEDS data for 2003-04, School Information Form H.

7.7 School Facilities

Much attention has been focused over the last few years on the poor quality of many of the school facilities in California.[37] Parents, teachers, and other advocates have illustrated the need for additional funds by describing the state of disrepair of specific schools. These efforts have succeeded in that California's voters have approved several bond issues with the funds designated both for the construction of new schools and for the modernization of existing schools. However, as many parents, teachers and advocates can attest to, there is still a need for existing facilities to be modernized and repaired and for new facilities to be built to eliminate overcrowding.

As suggested by projection of growth in public school enrollment and the uneven distribution of this growth throughout the state, more classrooms and existing facilities, as well as whole new

[37] For an overview as to what is known about the quality of school facilities in California see: Chapter V entitled "California's K-12 Public School Facilities" in Carroll et al., 2005; Oakes, 2002.

schools at new locations, will need to be built in order to mitigate the overcrowding. The uneven distribution of this growth in school enrollment means that some schools will need to be adding classrooms, including both portable and traditional classrooms, while others will need to address the equally difficult problem of declining enrollments and school closings.

7.7.1 Available Information for School Facilities

For this study, an effort was made to obtain consistent information on the characteristics of school facilities for individual school districts so that information could be developed for each of the four IOUs. After some initial inquiries, we determined that the state has not maintained an up-to-date inventory of school facilities across school districts that could be used to develop IOU-specific information. This fact was confirmed by the recent settlement of the Williams v. California that mandated the state initiate a process to collect information for selected school facilities. State legislation implementing this mandate requires that a one-time assessment of facilities be conducted, but the requirement is limited to poor performing schools with facilities constructed prior to January 1, 2000. These assessments are to be completed and submitted to the Office of Public School Construction (OPSC) by January 1, 2006.[38]

At present, information on the number of classrooms and number of classrooms over 25 years old is published annually by the California Department of Education.[39] However, this information is not developed from information from individual school districts but is instead a "top-down" estimate developed for statewide use. In addition, information on "new construction five-year need" and "modernization five-year need" is published by the Department of Education but this is based on information filed by individual school districts with the Office of Public School Construction (OPSC). *Only if a school district has begun the process of applying for funds administered by the OPSC will the needs of that school district be included in the reported information.*

The information available from the CDE and the OPSC generally does not distinguish between traditional classrooms and portable classrooms. This distinction is made in a recently completed, one-time study conducted by the California Department of Health Services (DHS). The initial step in a comprehensive study of environmental health conditions in California's public schools, DHS conducted a census of school districts and schools to determine the number of classrooms in use, the share of classrooms that are portable, the approximate age of both traditional and portable classrooms and number of additional portables on order or planned for installation during the 2000-01 school year. [40].

The survey database included 1,049 districts and 8,554 individual schools. Enrollment in 2000-01 totaled just over 6 million. More than 90 percent of the districts contacted eventually responded; these districts contained 92 percent of the state's schools and 94 percent of student enrollment. Some responses were incomplete. Table 7-14 presents these results.

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[38] Information is from the State of California, Office of Public School Construction. 2005.

[39] California Department of Education, 2005a, p. 107.

[40] California Department of Health Services, 2003.

Table 7-14. California Public School Enrollment and Number of Teachers

	1999-00	2000-01	2001-02	2002-03
Students	5,940,976	6,038,231	6,134,839	6,236,359
Teachers	290,547	297,277	300,032	n/a

Source: DHS, 2004, Appendix II, p. 11-4.

As indicated in Table 7-15, most respondents provided information on the number of portable classrooms and the approximate age of the classrooms. However, substantially fewer of those contacted, accounting for only 65 percent of the schools, provided information on the number of portables on order or with plans to order in the coming year.

Table 7-15. Response Rates for Classroom Survey Forms

	Any Response (%)	Portable Classrooms (%)	Approximate Age of Portables (%)	New Portables Planned (%)
Districts	90.2%	na	na	na
Schools	92.3%	91.9%	89.2%	65.1%
Enrollment	94.0%	93.7%	91.3%	61.5%

Source: DHS, 2004, Appendix II, p. 11-4.

Using the data provided for each school, number totals for each item were tabulated. Totals were then adjusted using the enrollment response rates. That is, estimates of statewide totals were determined by taking the data provided for schools reporting and then scaling it upward, proportional to the *enrollment* of responding schools (i.e., dividing by the response rate). For classrooms numbers and the number of portables by year manufactured, the adjustment is small (e.g., 1/0.94 = 1.064 or +6 percent adjustment). *Estimates of new portables planned have greater uncertainties, since the adjustment for missing schools is higher (+60 percent).*

7.7.2 Number of Classrooms and Need for New Classrooms

As suggested above, information on the number and condition of school facilities is somewhat limited. The lack of information (e.g., a state-wide inventory of school facilities) may seem surprising given the role of the state in funding new construction and modernization projects. There is limited information on the number of classrooms and on the need for new facilities.

For the 2003-04 school year, CDE estimated that there were 286,600 classrooms with nearly 75 percent of these classrooms (or 211,200) being over 25 years old.[41] As noted above, this is a top-down estimate and is not developed from recent information provided by school district or schools. While one would anticipate that older schools are more likely to need replacing than newer schools, this depends on the extent to which both the over 25 years old and under 25 years old facilities have been maintained and updated through the years.

The Office of Public School Construction (OPSC), the state agency that supports the State Allocation Board (SAB) in making funding available for modernizing and building safe and adequate school facilities, has reported a need of 35,110 more classrooms by 2009. In addition, the OPSC reported a need to modernize another 46,243 classrooms by 2009. These estimates are based on public school district applications on file with the OPSC. The state's share of costs for these improvements is projected to require funding of over $16 billion, including $12.13 billion for new construction and $3.95 billion for modernization projects.[42]

The present need for new schools and modernization of existing schools provides numerous opportunities for a wide variety of energy efficiency programs targeted to both new construction and modernization. These programs, if properly designed, have the potential to capture important energy savings that have a relatively long useful life. These programs must consider the diverse conditions throughout California as well as the mix of traditional and portable school facilities.

7.7.3 Traditional and Portable Classrooms

Classrooms are frequently divided into two types: traditional and portable. Traditional classrooms are generally part of a multi-room facility built on a foundation at a specific site. Portables classrooms are generally defined as classroom structures that can be transported over public streets. As a general rule, portable classrooms are factory manufactured and without a foundation. The primary advantage of portable classrooms as compared to traditional classrooms is that they allow school districts to respond quickly to increased and unanticipated classroom needs at various schools within a district.[43] The disadvantages relate to the lack of attention given to siting and maintenance of portable classrooms as well as the increased noise level of these classrooms relative to traditional classrooms.

The DHS study estimated that there were 268,000 classrooms in use at the state's public schools in the 2000-01 school year (Table 7-16). Nearly 30 percent, or almost 80,000, of the classrooms used for instruction in California public schools were estimated to be portables. A small fraction of schools, under 13 percent, had no portables at all. The average classroom occupancy in California was about 22 students per classroom. Actual occupancies cover a wide range, from the mandated 20 or less for K-3 grades for elementary schools participating in the state's class-size reduction program to 30 or more students in some middle and high schools.

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[41] California Department of Education, 2005a, p. 107.

[42] California Department of Education, 2005b.

[43] EdSource Online, 1998b.

Table 7-16. Number of Classrooms by Type and Number of Portable Classrooms by Approximate Age and Plans for 2000-02: California

	Number	Percent
Students per Classroom		
All Classrooms	268,030	
Students (1999-00)	5,940,976	
Students per Classroom*	22.2	
Classrooms by Type		
Portable	79,191	29.5%
Traditional	188,839	70.5%
Total	268,030	100.0%
Portable Classrooms by Age		
5 Years or Less	31126	39.3%
6-15 Years	26,004	32.8%
More than 15 Years	22061	27.9%
Total	79,191	100.0%
Plans for New Portables, 2001		
New Portables Planned	4109	5.2%
Portables (2000-01)	79,191	100.0%

Source: DHS, 2004, Appendix II, p. 11-5.

In the district survey, respondents were asked to indicate the degree to which portable classrooms were used in their districts. Although based on a sample of only 74 respondents, the results are very consistent with the numbers reported above.

While most all schools have some portable classrooms, the greatest concentration of portables is in elementary schools (K-5 for the DHS study). The numbers and total enrollment for each school type are given in Table 7-17. This information is provided for a number of school types based on grade levels served by the school.[44] The average number of students per classroom was higher in middle and high schools than elementary and "lower" grade schools (22-24 versus 19-21 students per classroom). Classrooms at K-12 ("All") schools were, on average, the most crowded (29 students per classroom), although less than 2 percent of the students attended K-12

[44] The primary school types listed are: Elementary – K - 5th, Middle – 6th to 8th, and High – 9th to 12th grades. Some schools use less standard grade ranges, and, notwithstanding their CDE designation, these schools were grouped into the following categories: "Lower" – K to 8th; "Upper" – 7th to 12th; and "All" – K to 12th. CDE designates some schools as "alternative" or "continuation," and these were parsed according to their grade levels as given in CBEDS.

schools. Similarly, middle and high schools contained proportionally fewer portable classrooms than elementary schools and "lower" grade schools (~22 percent versus 35 percent). Portables were used more frequently at schools containing "All" grades (39 percent) and "Upper" grades (42 percent). While elementary schools used almost twice the proportion of portables than middle and high schools, the fraction of elementary schools with at least one portable classroom was not that much higher than the overall average (93 percent versus 82 percent).

A significant issue in assessing the quality of portable school facilities is the year the classroom was manufactured. A large proportion of portable classrooms (39 percent) are relatively new, having been manufactured in 1996 or later. However, 28 percent of the portables are relatively old, having been manufactured prior to 1985. School districts anticipated purchasing more than 4,000 new portable classroom units for 2001-02, which represented about a 5 percent growth in numbers (although how many units were planned for "retirement" was not determined).

Table 7-17. K-12 Enrollment, and Classroom Data by School Type for 2000-01

	Elementary (K to 5)	Middle (6 to 8)	High (9 to 12)	"Lower" (K to 8)	"Upper" (7 to 12)	"All" (K to 12)	All Schools
Number of Schools							
Schools	55.8%	14.3%	17.7%	7.3%	1.8%	3.1%	8,554
Percent w/Portables	92.7%	83.7%	80.9%	73.0%	66.9%	71.6%	87.4%
Enrollment							
Students	46.5%	18.3%	27.4%	3.6%	0.4%	1.8%	6,007,002
Percent at Schools with Portables	95.7%	86.7%	91.0%	87.0%	80.0%	77.0%	92.2%
Students per Classroom	21.1	24.1	22.4	19.4	16.5	29.0	21.6
Classrooms							
Total	51.6%	16.9%	25.6%	4.2%	0.4%	1.5%	268,030
Portables	60.9%	13.1%	18.7%	4.9%	0.5%	1.9%	79,191
Percent Portables	34.8%	22.8%	21.6%	34.6%	42.4%	38.6%	29.5%

Source: DHS, 2004, Appendix II, Table 5, p. II-6.

As part of DHS's Portable Classroom Study (PCS), school and classroom age distributions were estimated from data for approximately 500 schools, weighted for the sampling frame and response rates. The respective age distributions are given in Table 7-18. The age distribution of traditional classrooms is very similar to the age distribution for schools, while portable classrooms are characteristically younger. While only 11 percent of the schools are reported to be less than 16 years old, slightly more than 20 percent of the traditional classrooms were less than 16 years old. This difference in the age of schools and the age of traditional classrooms suggests that about 11 percent of traditional classrooms had been added in expansion projects at schools 16 years and older in recent years.

In contrast, more than 40 percent of portable classrooms were less than 10 years old and over 60 percent were under 16 years old. Since schools may purchase used portables and since portable classrooms are purchased in part so that they can provide the school district with flexibility, this information cannot be used to determine the age of the schools where newer portables are located.

Table 7-18. Age of Portable Classrooms, Traditional Classrooms, and Schools, Spring 2001: California

Age Range (Years)	Portable	Traditional	Schools
0 to 3	22.6%	5.2%	
4 to 5	18.6%	1.8%	
6 to 10	14.1%	5.5%	11.0%
11 to 15	22.1%	7.6%	
16 to 20	8.4%	1.7%	7.3%
21 to 30	8.0%	18.8%	10.9%
31 to 40	4.9%	18.0%	22.0%
41+	1.3%	41.4%	48.7%
Total	100.0%	100.0%	100.0%

Source: DSH, 2004, Appendix II, Table 6, pp. II-6.

More than half of all portable classrooms (in 2001) were 10 years or younger, while over 11,000 portables (14 percent) were 20 years or older. Statewide, almost 5,000 portables being used as classroom were 30 years or older.

Data for the state's largest districts are provided in Table 7-19. As of 2000-01, these 20 districts contained 29 percent of the state's public school enrollment and 23 percent of the schools. Collectively, their enrollment growth rate between 2000-01 and 2001-02 was greater than the statewide average (0.9 percent versus 0.3 percent). The growth rate in enrollment was over 2 percent for six districts between these two school years. The largest districts' classrooms were somewhat more crowded (22.5 versus 21.8 students per classroom). The proportion of portables used by the 20 largest districts was close to the same proportion as the statewide average

(approximately 30 percent). However, of the 20 districts, the school district with the highest one-year growth rate, Elk Grove Unified, reported that nearly 55 percent of the all classrooms were portables. This substantially higher than average use of portables was not the case for Riverside Unified, which also reported a high one-year growth rate of 4.1 percent, only slightly less than the 4.5 percent growth rate reported by Elk Grove.

With respect to the date the portables were manufactured, the portables used at the largest districts, when compared to those used throughout the state, were frequently older units (44 percent versus 28 percent), and fewer of their portables were newer units (27 percent versus 39 percent).

Information on "planned to purchase" portables was incomplete; the classroom-weighted mean for the districts providing data (n=6) was 7.7 percent, compared to the statewide enrollment growth of 0.52 percent. Subsequent to the 2000-01 survey, Los Angeles Unified reported purchasing 245 portables in 2001-02, or an increase of approximately 3 percent per year.

Additional information on future use of portable classrooms was addressed in the district survey. In this survey, we asked respondents to indicate whether they expected the percentage of their portable classrooms to increase. Thirty-three percent expect the percentage to increase, 19 percent expect it to decrease and 48 percent expect no change. When asked about the timeframe for this change, 82 percent expect the change to occur within 2 to 5 years, and 18 percent within one year. Similar results were noted in both northern and southern California.

Table 7-19. Enrollment, Number of Schools, Students per Classroom, and Types of Classroom, 2000-01: 20 Largest School Districts in California

District	2000-01 Enrollment	Growth Rate*	Schools (N)	Students per Classroom**	Numbewr of Classrooms	Portables as Percent of All Classrooms	Percent of Portables (%)		
							Older	Newer	Planned
Los Angeles Unified	720,534	1.7%	655	23.1	28,493	29.2%	63.5%	20.5%	n/a
San Diego Unified	140,328	-0.6%	175	19.8	7,043	34.9%	53.4%	37.0%	n/a
Long Beach Unified	93,235	2.5%	85	21.0	4,268	28.8%	15.5%	61.7%	n/a
Fresno Unified School District	77,588	1.3%	94	21.7	3,433	37.7%	17.4%	19.2%	n/a
San Francisco Unified	59,979	-2.4%	113	17.6	3,500	8.4%	n/a	n/a	n/a
Santa Unified	59,837	-1.1%	50	24.5	2,527	31.4%	n/a	n/a	n/a
Oakland Unified	54,264	-4.2%	92	23.3	2,262	29.1%	67.4%	35.3%	17.9%
Sacramento City Unified	53,693	0.9%	79	18.7	2,752	38.7%	38.8%	35.6%	n/a
San Juan Unified	50,167	2.0%	83	19.9	2,433	21.2%	42.6%	27.6%	n/a
Garden Grove Unified	48,742	1.6%	65	25.0	1,926	21.0%	27.5%	48.3%	n/a
San Bernadino City Unified	52,031	0.5%	62	26.2	1,911	37.9%	45.5%	54.2%	n/a
Capistrano Unified	40,913	-2.7%	39	21.8	1,790	37.4%	24.3%	21.3%	6.3%
Elk Grove Unified	46,090	4.5%	50	26.0	1,723	54.6%	21.5%	20.7%	n/a
Riverside Unified	38,124	4.1%	44	26.6	1,621	31.5%	8.2%	28.4%	2.0%
Mt. Diablo Unified	36,614	0.3%	54	19.9	1,777	18.7%	86.3%	7.0%	n/a
Stockton City Unified	37,322	2.9%	44	22.4	1,607	34.9%	18.7%	35.7%	2.9%
Saddleback Valley Unified	35,199	-0.2%	37	23.1	1,569	24.9%	12.0%	56.3%	-
Montebello Unified	34,794	0.7%	28	25.2	1,350	37.0%	48.3%	21.4%	2.6%
Fontana Unified	37,244	3.1%	34	25.4	1,440	35.3%	3.3%	34.0%	9.8%
West Contra Costa Unified	34,499	-4.6%	59	21.1	1,650	26.1%	44.6%	32.7%	-

* Enrollment increase from 2000-01 to 2001-02.

** District-wide average of school values.

Source: DHS, 2004, Appendix II, Table 7, pp. II-8.

For portable classrooms, the most important non-energy benefits associated with energy efficiency improvements appear to be improved productivity resulting from improved lighting and reduced noise and improved health resulting from reduced indoor pollutants.[45] While many of these participant benefits are hard to measure (e.g., "comfort"), an effort should be made to estimate dollar values for these benefits in order to allow comparison with direct energy benefits and to provide more comprehensive information for cost-effectiveness assessments of programs.

Whether the use of portables will decrease or increase in the near future, there is little question that portable classrooms will continue to be used by most school districts. The continued use of portables represents an enormous opportunity for a variety of energy efficiency programs to intervene early on in the planning process to capture both energy and non-energy benefits. However, because much has happened during the past four years with respect to the passage of school bonds and allocation of new construction funds that the numbers and the results of the DHS study are, according to one of the authors, very likely misleading. More current information, although somewhat limited, will be available in January 2006 as a result of the Williams v. California settlement, which mandates the state initiate a process to collect information on selected school facilities. The state legislation implementing this mandate requires a one-time assessment of facilities be conducted, but the requirement is limited to poor performing schools with facilities constructed prior to January 1, 2000. Thus, when more current and complete data are not available, program planners will need to determine plans for the addition of portable classrooms and opportunities to intervene on a district-by-district basis.

[45] California Air Resources Board and California Department of Health Services, 2004.

8 Public School Finances

8.1 Public School Finance in California

By all accounts, California's public school finance system is extremely complex, having evolved over the last three decades as a result of court decisions, legislative actions, voter-approved initiatives, and government regulations. Beginning with a system that was largely controlled by local school districts in the 1960s, the system is now largely controlled by the state legislature and governor. The prior system has been described as centralized, more flexible, and more responsive to the needs identified by local school districts, while the present system has been described as overly centralized, inflexible, and unresponsive to local school district needs. To a large extent, this evolution to a more centralized system has resulted from a need to address concerns regarding the equity of the locally controlled system, as dictated by court decisions.[46]

To track revenues and expenses, school districts in California practice what is termed "fund accounting," an accounting practice followed by most all government enterprises. The General Fund is used to account for usual operating revenues and expenses, including staff salaries, supplies, and regular maintenance. Typically, districts are required to maintain several other funds to create clear boundaries between expenses and revenues in the general fund and expenses and revenues for specific uses, such as operating a cafeteria, constructing a new building, and modernizing existing buildings. These funds are generally for capital projects, special revenue funds, and proprietary funds. Capital projects generally include building and modernization, while special revenue funds cover deferred maintenance, as well as funds for revenues and expenses that result from the operation of cafeterias and adult education programs.

At present, school district revenues depend on four primary factors:

- The number of students attending class or, technically, "Average Daily Attendance"
- The characteristics of students and families, such as the number of students with special needs
- The state allocation as determined by the "revenue limit," an amount determined by complex formula
- Other programs that a district may operate, such as adult education programs

The source of these revenues comes from five distinct sources: state funds, local property taxes, federal government, local miscellaneous revenues, and the state lottery. Roughly 60 percent comes from state funds and an additional 20 percent from local property taxes. Federal government funding was expected to provide13 percent of revenues in 2004-05, an amount that has been increasing over the past several years.[47] Local miscellaneous revenues are sources that

[46] Descriptions of the evolution of California's school finance system and characterization of the present system can be found in Connell et al., 2005, pp. 27-56; Rose et al., 2003, pp. 33-46; EdSource, 2004b; EdSource, 2004d, pp. 1-2; Lawrence O. Picus, 2001.

[47] EdSource, 2004d, p. 1.

are locally controlled. These accounted for approximately 6 percent of school district revenues in California for the 2003-04 fiscal year. There is considerable variation in the contribution of local miscellaneous revenues to district revenues, with the general pattern being that districts with higher amounts per pupil tend to be wealthier.

As indicated above, the General Fund (01 Financial Data Code) is used to track the revenues and expenses for ordinary operations of a school (See Appendix D for a list of Financial Data Codes used by California's school districts). All transactions, except those required or permitted by law to be allocated elsewhere, are accounted for in the General Fund.

As shown in Table 8-1, the public schools in California obtain 81 percent of their funds for the general fund from the state.[48] Among the four IOUs, the percentage of general fund revenues received from the state varies from 79.7 percent for SDG&E to 84.6 percent for SoCalGas. These differences are primarily a result of school districts in the SDG&E service territory receiving a larger share of revenues from local sources as compared to school districts in the service territory of SoCalGas.

Table 8-1. Source of Revenues for General Fund, 2003-04: California and Four Major IOUs

Revenue Source	Percent of Revenue				
	California	PG&E	SCE	SDG&E	SoCalGas
Federal	9.7%	10.0%	9.7%	8.4%	8.9%
State	81.0%	79.8%	83.5%	79.7%	84.6%
Local	7.8%	8.4%	5.9%	10.9%	5.6%
Other	1.5%	1.8%	0.9%	1.1%	0.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: California Department of Education, SACS, 2003-04.

As specified by state regulations, school districts are required to have separate funds to track the revenue and expenditures specifically for school facilities. For 2003-04, three funds tracked 90 percent of school district revenues for school facilities. These three funds are the Deferred Maintenance Fund (14), the Capital Facilities Fund (25), and the County School Facilities Fund (35). The Deferred Maintenance Fund is used to account separately for state apportionments and the schools' contributions for deferred maintenance purposes. The Capital Facilities Fund is used primarily to account separately for moneys received from fees levied on developers or other agencies as a condition of approving a development. The County School Facilities Fund received apportionments from the State School Facilities Fund authorized by the State Allocation Board for new school facility construction, modernization projects, and facility hardship grants. Revenues and expenses tracked in the Capital Facilities Fund and the County School Facilities

[48] For most districts, some of these revenues are from local property taxes.

Fund are for the purpose of acquiring or constructing major capital facilities. For 2003-04, revenue in these three funds made approximately $3.6 billion dollars available to school districts in California.[49]

Table 8-2. Number of Districts Receiving Revenue for Selected District Funds, 2003-04: California and Four Major IOUs

	California	PG&E	SCE	SDG&E	SoCalGas
Number of Districts					
Revenue into Fund 14*	1002	637	214	46	319
Revenue into Fund 25**	833	520	183	44	287
Revenue into Fund 35***	623	368	156	33	225
Total Districts	1059	683	249	50	358
Percentage					
Revenue into Fund 14	94.6%	93.3%	85.9%	92.0%	89.1%
Revenue into Fund 25	78.7%	76.1%	73.5%	88.0%	80.2%
Revenue into Fund 35	58.8%	53.9%	62.7%	66.0%	62.8%
Total Districts	100.0%	100.0%	100.0%	100.0%	100.0%

* Fund 14 refers to the Deferred Maintenance Fund

** Fund 25 refers to the Capital Facilities Fund

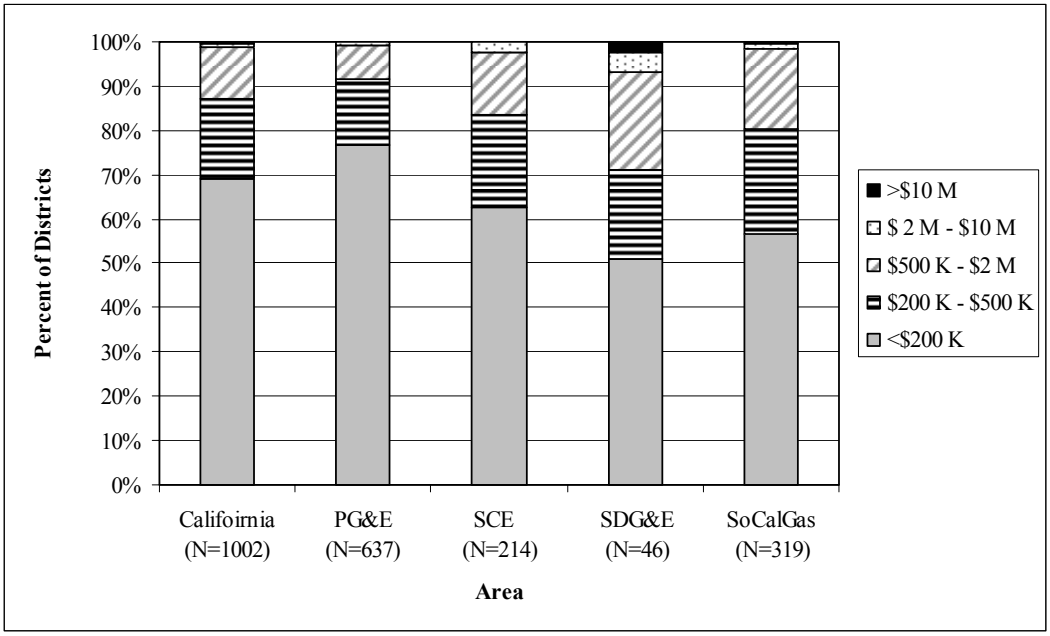
*** Fund 35 refers to the County School Facilities Fund

Source: California Department of Education, SACS files, 2003-04.

While nearly 95 percent of school districts in California received some revenues for deferred maintenance (Fund 14) in 2003-04, the actual dollar amounts tended to be small. As shown in Figure 8-1, nearly 70 percent of the school districts in California received less than $200,000 for deferred maintenance. Among the four IOUs, the percentage of districts receiving deferred maintenance (Fund 14) revenues varied from less than 86 percent for SCE to over 93 percent for PG&E. The percentage receiving less than $200,000 varied from approximately 50 percent for SDG&E to roughly 75 percent for PG&E. The differences reflect differences in the relative size of school districts in the service territories of the four IOUs as well as differences in demonstrated need.

[49] California Department of Education, SACS files, 2003-04.

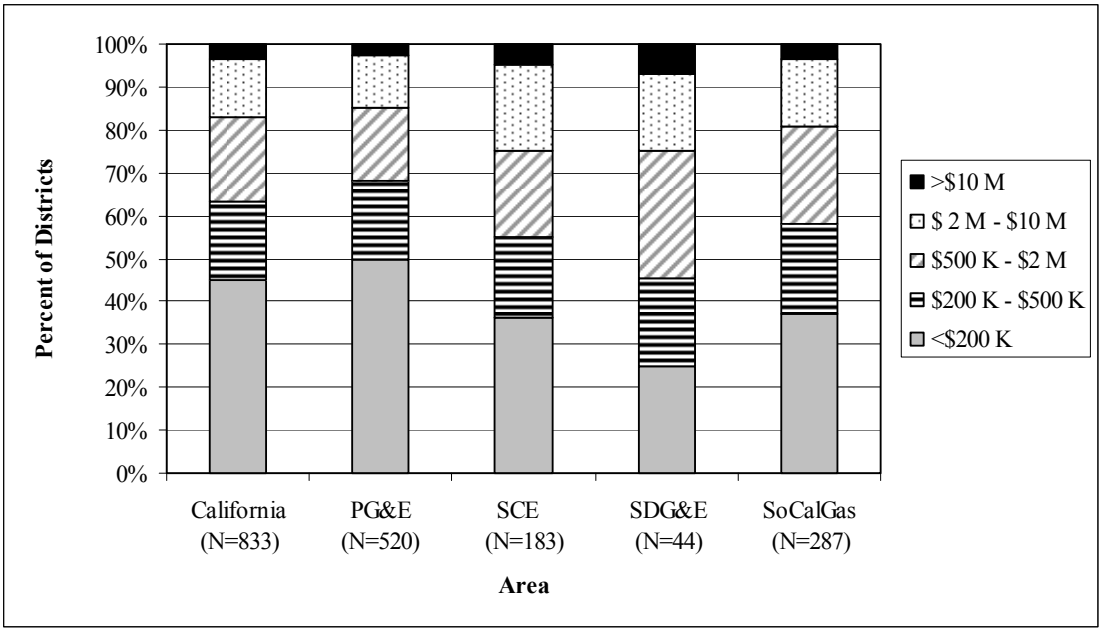
Figure 8-1. Revenues Received for Deferred Maintenance (Fund 14) by School District, 2003-04: California and Four Major IOUs



Data shown in this figure are for Fund 14 for Deferred Maintenance. Source: CDE, SACS files, 2003-04.

The second major source of revenues for school facilities is the Capital Facilities Fund (25), the account used to track revenues from developer and related frees. Seventy-nine percent of school districts receive revenue mitigation/development fees (see Table 8-2). The amount of revenue received from this source tends to be higher when compared to deferred maintenance revenues, with over 40 percent of the school districts with revenues from this source receiving more than $200,000 (See Figure 8-2). Among the four IOUs, the percentage of school districts receiving revenues from developer fees varies from a low of 74 percent for SCE to a high of 88 percent for SDG&E. Revenues tend to be highest for SDG&E school districts, with more than 50 percent of the 44 school districts receiving these funds receiving more than $500,000.

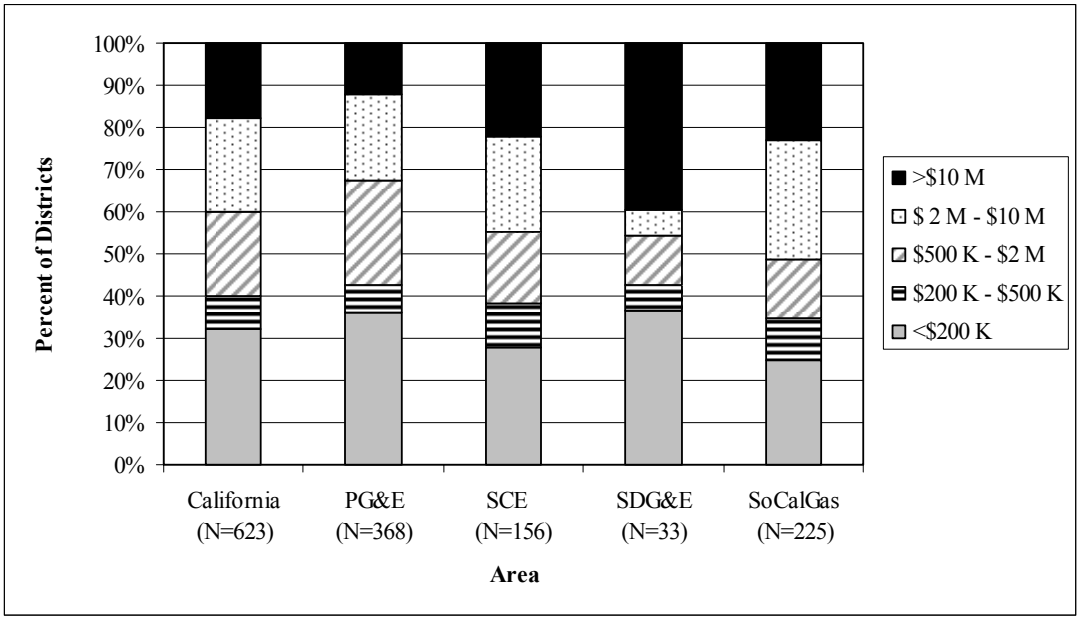
Figure 8-2. Revenue from Mitigation/Development Fees by School District, 2003-04: California and Four Major IOUs



Data shown in this figure are for Fund 25, the Capital Facilities Fund.
Source: CDE, SACS files, 2003-04.

The third major source of revenue for school facilities is the County School Facilities Fund (35), the fund used to track revenues and expenses for new school facility construction, modernization projects, and facility hardship grants. Fifty-nine percent of the school districts in California had revenues that were tracked in the County School Facilities Fund in 2003-04. For theses 623 school districts, amounts ranged from less than $200,000 for over 30 percent of the school districts to over $2 million for approximately 40 percent of the districts (see Figure 8-3). Among the four IOUs, the percentage of school districts with revenues for major projects tracked in the County School Facilities Fund ranged from 54 percent for PG&E to 66 percent for SDG&E. There were substantial variations in the amount of revenues received by school districts with the percentage receiving less than $2 million dollars ranging from over 65 percent for PG&E to less than 50 percent for SoCalGas.

Figure 8-3. Revenue from County School Facilities Fund by School District, 2003-04: California and Four Major IOUs



Data shown in this figure are for Fund 35, the County School Facilities Fund.
Source: CDE, SACS files, 2003-04.

8.2 Expenditures

As shown in Table 8-3, the majority of expenditures in the General Fund are for salary and benefits of school employees. The next highest outlay is for services and operating expenses. This type of expenditure includes services, rentals, leases, maintenance contracts, dues, travel, insurance, utilities, and legal and other operating expenditures. Among the four IOUs, there are no major differences in the allocation of expenditures for the five categories listed in Table 8-3.

Table 8-3. Expenditures from General Fund, 2003-04: California and Four Major IOUs

	Percent of Expenditures				
Expenditure	California	PG&E	SCE	SDG&E	SoCalGas
Salary & Benefits	78.3%	77.9%	80.1%	80.5%	81.0%
Books & Supplies	5.4%	5.2%	5.4%	5.4%	5.3%
Capital Outlay	1.2%	1.2%	1.1%	0.7%	0.7%
Services & Operating Expenses	11.5%	11.8%	10.3%	9.5%	9.7%
Other Outgo	3.6%	3.9%	3.1%	4.0%	3.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: CDE, SACS files, 2003-04.

The account titled "Operating and Housekeeping", a component of the "Service and Operating Expenses" in the General Fund, is used to track a number of distinct expenditures, including expenditures for water, heating fuel, light, power, waste disposal, pest control, laundry and dry cleaning. The SACS does not track specific expenditures in this category, so the exact amount of money spent on utilities is not available from this system. However, in 2003-04, nearly $900 million was spent for these services across all public school districts in California. As noted in Table 8-4, reducing these costs by 10 percent would result in savings of nearly $90 million; these are dollars that could be used for teacher salaries and needed instructional materials, for other pressing needs, or to reduce state taxes. The amount of savings for the four IOUs reflects differences in the level of General Fund expenditures as opposed to the percentage allocated to Operations and Housekeeping Services.

Table 8-4. Operations and Housekeeping Services as Percentage of Expenditures, 2003-04: California and Four Major IOUs

	California	PG&E	SCE	SDG&E	SoCalGas
General Fund Expenditures	$196,733,754	$83,141,193	$54,203,130	$13,808,154	$45,616,155
Operations and Housekeeping Services as % of General Fund Expenditures	2.3%	2.3%	2.4%	2.2%	2.1%
Potential Savings for 10% Expenditure Reductions	$87,113,492	$36,328,588	$22,368,786	$6,202,410	$22,213,708

Source: CDE, SACS files, 2003-04.

The expenditures tracked for the Deferred Maintenance, Capital Facilities, and County School Facilities funds are divided into 45 categories. However, 72 percent of the expenditures are within two codes – Sites and Improvement of Sites (6100) and Buildings and Improvement of Buildings (6200). Taken together, the total expenditure for the two codes within the three funds was $3.9 billion dollars and ranged from $132 million dollars to $246 million dollars per district.

The expenditures across all 45 categories totals $5.4 billion (i.e., expenditures for Funds 14, 25, and 35). The school districts are both building new facilities, modernizing existing facilities, and undertaking deferred maintenance each year, and, as a result, are using the revenues tracked in these accounts. The balance sheets for these funds indicate assets remaining for future use in each of them.

8.3 Potentially Available Funds for Public School Facilities

Most funds for school facilities are allocated by the state, with one federal program available. In most instances, local school districts are required to match state funding for new construction and modernization projects. In addition to local parcel taxes, other local funding sources may also be available to supplement federal and state funding for public school facilities. These sources may include individual, corporate, and private foundation contributions. The information presented below is for state and federal funding only, with no other funding sources included. Funding specific to energy efficiency is detailed in Section 11.

8.3.1 State Funding of Public School Construction

In California, the State Allocation Board (SAB) is responsible for making funding apportionments for public school construction projects. The Office of Public School Construction (OPSC) is responsible for administering the resources available to the SAB from the passage of state bond issues and other sources. The OPSC staff processes applications and provides assistance to school districts in meeting the requirements of the application processes for the various programs.

Three large bonds passed in the state in the past 7 years: Proposition 1A in 1998, Proposition 47 in November 2002, and Proposition 55 in March 2004. Proposition 1A provided close to $7 billion in funds for new construction, modernization, and class size reduction. Those funds were released from November 1998 to November 2002. Proposition 47 provided $11.4 billion for new construction and modernization. As of June 2004, $10.3 billion of these funds had been apportioned. The passage of Proposition 55 in March 2004 provided an additional $10 billion for school facility projects, including both modernization and new facility projects. As of June 2004, less than $500 million of Proposition 55 funds had been allocated.[50] Thus, as of June 2004, the OPSC reported that $10.7 billion from all sources remained available for new applications. Over 99 percent of these funds are presently available under the School Facility Program. During the 2003-04 year, the OPSC reported processing applications that total close to $2 billion. If OPSC continues funding at the rate of $2 billion per year, the remaining funds would be available through 2008.[51]

Most of the state funds allocated between July 2003 and June 2004 ($1.87 billion of $1.98 billion) was allocated under the School Facility Program; these funds were allocated both for construction of new facilities and for modernization projects. The funds were allocated to school

[50] State Allocation Board/Office of Public School Construction. 2004. p. 2.

[51] State Allocation Board/Office of Public School Construction, 2004, pp. 1, 52-53.

districts located in counties throughout the state, with 192 school districts receiving funds for new construction and 310 school districts receiving funds for modernization.[52]

Currently, the SAB, with the support of the OPSC, maintains seven programs that provide funding for school facilities. These programs are described below, including information on required matches by local school districts.

1. School Facility Program (SFP) – This program disburses Propositions 47 and 55 funds. Through this program, districts are required to provide matching, dollar-for-dollar funding, with new construction projects requiring a 50 percent match (i.e., the state pays for 50 percent of the project, with the remaining 50 percent paid for by the district) and with modernization projects requiring a 40 percent match (i.e., the state pays for 60 percent of the project with the remaining 40 percent paid for by the district). Districts unable to provide local funding may be eligible for additional state funding. The state sets a maximum amount, on a per-pupil basis, of funds allowed under this program.

2. Joint-Use Program – Assembly Bill 16 was passed in 2002 to fund joint-use projects for a shared school building facility. This program, also disbursing Propositions 47 and 55 funds, had $100 million available for projects that remodel/expand multipurpose rooms, gymnasiums, libraries, childcare facilities, or teacher education facilities. At present, the amount of these funds still available is unknown.

3. Critically Overcrowded Schools Facilities Program – This program permits certain schools to apply for a preliminary apportionment for new construction projects to relieve overcrowding in advance of meeting all of the SFP requirements. The funding is reserved, but must be converted to a regular SFP apportionment within a four-year period (with a single one-year extension). The state releases a list of school districts that might be eligible for this program. These schools may be planning to perform some sort of upgrade/new construction. As of the end of the 2003-04 school year, $1.7 billion had been apportioned (303 projects). From January 2004 to June 2004, 497 applications were accepted and subsequently funded as of October 2004.

4. Energy Conservation Program –$20 million has been allocated by Propositions 47 and 55 (for a total of $40 million); these funds cover increased costs for the design and construction of project components associated with school facility energy efficiency. These funds are divided between new construction and modernization. Information on how much of this funding is still available was not reported in the SAB/OPSC annual report.

5. Charter School Facility Program – Proposition 47 designated $100 million and Proposition 55 allocated another $300 million to fund new construction of charter school facilities. As of July 2003, $97 million had been apportioned; additional funds were to be

[52] State Allocation Board/Office of Public School Construction. 2004, pp. 8-23. Note that the OPSC does publish information by school district but the tables found in the annual report were not available in an analysis-friendly format. The OPSC web site also provides data on allocations to individual school districts by individual projects.

apportioned in December 2004. At present, how much remains of these funds for is unknown.

6. Deferred Maintenance Program (DMP) – This program provides funds on a matching, dollar-for- dollar basis to assist school districts with expenditures for major repair or replacement of existing school building components. The program helps with needs that fall outside the normal modernization program. According to the OSPC, these include repair or replacement of plumbing, HVAC, electrical systems, roofing, interior and exterior painting, floor systems, etc. The district must have an approved five-year deferred maintenance plan that identifies deferred maintenance needs. In January 2004, this program added a Restroom Maintenance component, but there is no funding attached to it. However, this component does provide for a complaint hotline; if the complaint investigation determines that a district is in violation of state law[53] regarding restroom maintenance, receipt of DMP funds can be put in jeopardy. As of June 2004, $101 million had been apportioned. The 2004-05 state budget provided an additional $237.8 million for this program.

7. State Relocatable Classroom Program – This program helps meet classroom needs for districts with excessive growth or unforeseen classroom needs by making portable classrooms available. The portable classrooms are leased at an annual rate of $4,000. Funds are provided for the acquisition, installation, and relocation of the portable classroom facilities, while the OPSC secures contracts with inspectors, architects and movers for this purpose.

8.3.2 Federal Funding

The federal government does not generally offer direct support to states or localities for financing school facilities. However, there is one program currently in place to help with renovation and another currently before Congress that could help with new construction.

1. Qualified Zone Academy Bond (QZAB) Program – Funds provided by this program are used to finance renovation and repair of public school facilities (not new construction). Under this program, the federal government provides a tax credit in lieu of the interest that local districts must usually pay on general obligation bonds. The school district or other bond issuer is then responsible for repaying only the amount borrowed, significantly reducing the overall cost of a bond. There are eligibility requirements for the program (which can be found at http://www.qzab.org/elegibility.asp). California has close to $49 million allocated for the program in 2005, which is subject to the annual federal budget process.

2. The America's Better Classroom Act of 2005 – The bill that would create this program is currently before the 109th Congress. The legislation was introduced in 2003, but was not passed by the 108th Congress. If passed, the program's financing aspects would be similar to those of Qualfied Zone Academy Bond (QZAB), but would promote

[53] Senate Bill 892, effective January 1, 2004.

construction of new schools. Additionally, as currently proposed, there do not appear to be eligibility restrictions similar to those of QZAB. If passed, the program would provide $11 billion in 2006 and another $11 billion in 2007.

The state and federal funding described above tends to be for the "Bricks and Mortar" of schools. However, there are programs available to specifically address utility use at school sites. These programs are discussed next.

9 Current Energy Efficiency Programs

Energy efficiency programs are available in California to help teach students about energy efficiency (curriculum-based programs) and help schools decrease their utility bills (facility-based programs). Some of the curriculum-based programs have components that, when implemented, can also help decrease utility use. Depending upon how the facility-based programs are designed, schools may receive simple rebates for energy efficiency measures or a whole spectrum of energy-related activities. Many of the same energy efficiency programs have been available for at least five years. Each is briefly described below.

9.1 Curriculum-Based Programs

9.1.1 Alliance to Save Energy Green Schools Program

The Alliance to Save Energy promotes the Green School Program (www.ase.org) which engages students in creating energy-saving activities in their schools, using hands-on, real-world projects. In addition, Green Schools encourages students to apply the lessons of energy-efficiency message in their homes and communities.

9.1.2 Energenius® Program

PG&E's Energenius® Program provides gas and electric energy conservation and safety, water conservation, and recycling education to school children in grades 1 through 8. More specifically, the program:

- Provides basic education to students that help shape their energy use behavior and practices as adults in home and work environments
- Teaches students how to conserve energy in their homes and increases their parents' energy awareness

The materials consist of five basic lessons:

1. Bill Buster Program (grades 6-8)
2. Primary Energenius Program (grades 1-3)
3. Energenius Primary Safety Program (grades 1-3)
4. Intermediate Energenius Program (grades 4-5)
5. Energenius Intermediate Safety Program (grades 4-5)

9.1.3 Energy Quest

This is the California Energy Commission's web site for children. This website includes art contests, science projects, literature, puzzles, history, and game shows with a focus on energy, all presented at several levels of difficulty.

9.1.4 LivingWise®

The LivingWise® Program works on a cooperative basis with local educators, supplying participants with energy efficient products and educational materials. Surveys collected directly from participants in the program allow program staff to provide participating schools with firsthand information regarding the program in their community. While educational materials are provided, energy savings as well as water savings can be achieved if the measures within each student kit are implemented.

9.1.5 NEED Project

The mission of the NEED Project (www.need.org), is: " . . . to promote an energy conscious and educated society by creating effective networks of students, educators, business, government and community leaders to design and deliver objective, multi-sided energy education programs." NEED provides curricula units at four levels (primary, elementary, intermediate, and secondary) to help teachers implement energy units in their classrooms. NEED also provides grants to California teachers to cover the cost of energy related teaching activities and materials.

9.1.6 PEAK Program

The PEAK Program (http://www.energycoalition.org/student_services/index.htm) is made up of a comprehensive curriculum supported by an energy simulation software package and an interactive web site. PEAK's curriculum presents 24 lessons per grade level, complete with labs, homework assignments, and relevant web sites for further research. The goal of the PEAK curriculum is to teach the essence of smart energy management including the study of electricity. Using PEAK's software, students 'map their homes,' simulate various energy use strategies and best practices, and develop customized household energy plans to engage with their families through a shared-savings arrangement. Additionally, the PEAK program has a component in which students work together to save energy at their schools.

9.1.7 Program Learning Tree

Project Learning Tree (PLT at www.plt.org), a program sponsored by the American Forest Foundation, is a multi-disciplinary environmental education program for educators and students in Pre-K through 12. This program provides curricula material on energy as well as forest ecology, municipal solid waste, water, and other areas.

9.2 Facility-Based Programs

9.2.1 Bright Schools Program

This California Energy Commission Program offers specific services to help schools become more energy wise, such as identifying cost-effective energy-efficient systems to meet their needs and providing design and implementation assistance – at little or no cost to them. This program has two components: 1) new schools construction, and 2) school modernization, deferred maintenance and energy audits.

9.2.1.1 D&R International School Energy Efficiency Program

This program is both a curricula- and facility-based program. D&R International's School Energy Efficiency (SEE) Program provides free energy education and facility improvement services to qualifying K-12 school districts in Northern and Central California. The SEE Program offers a variety of educational resources to teach students about energy, and provides technical support to help schools evaluate and implement energy efficiency facility upgrades. D&R manages the delivery of education and facility improvement services to participating school districts with support from an experienced team of professionals. Program services include energy efficiency curriculum integration, teacher and facility staff workshops, ENERGY STAR® benchmarking, school building energy audits, and detailed cost-benefit analysis reports.

9.2.1.2 New School Construction

Schools built with energy-efficient designs will cost less to operate, offering continuous savings and leaving more money for education. Many new schools incorporate equipment and building measures that barely meet recommended energy-efficiency standards. However, many of these designs could be improved with little or no additional expense. Bright Schools provides technical assistance early in the design phase, before the plans are solidified. The savings accumulate from the first day of operation. For new school construction, Bright Schools can:

1. Provide design consultation
2. Identify cost-effective energy-saving measures
3. Compare different technologies
4. Develop specifications for energy-efficient equipment
5. Help with the selection of architects and other design professionals who have school construction and energy-efficiency expertise
6. Review construction plans
7. Complete value engineering of specific energy-efficiency measures

9.2.1.3 School Modernization, Deferred Maintenance and Energy Audits

Bright Schools can help schools get the most from modernization and maintenance investments. With an evaluation of the five-year deferred maintenance plans or an energy audit of school facilities, energy-related projects can be identified that should be implemented immediately as part of a comprehensive Bright Schools energy package. Schools planning major renovations can benefit from the program’s technical assistance. The program can also help get loans to obtain the matching funds required by some state programs. For school modernization and deferred maintenance efforts, Bright Schools can:

1. Conduct energy audits and feasibility studies

2. Review existing proposals and designs

3. Provide equipment bid specifications

4. Assist with contractor selection

5. Assist with installations

9.2.2 California Coalition for Adequate School Housing

The Coalition for Adequate School Housing (CASH) (www.cashnet.org) provides resources for building and operating a school. The goal of CASH is to promote, develop, and support state and local funding for K-12 construction. C.A.S.H. membership includes school districts, county offices and private sector businesses including: architects, attorneys, consultants, construction managers, financial institutions, modular building manufacturers, contracts, developers, and others that are in the school construction industry.

9.2.3 California High Performance Schools Program (CHPS)

The CHPS seeks to create a new and improved generation of energy-efficient, high performance educational environments. It plans to achieve this goal through the development and promotion of tools, processes and interventions to deliver sustainable energy efficiency in California K-12 schools. More specifically, CHPS will accomplish this objective by:

1. Communicating the value of high performance schools through public and professional outreach and educational efforts, and linking that value proposition with specific solutions and resources available through the stakeholders

2. Providing technical assistance, tools, and training to influence the design, specification, construction and operation of energy efficient schools

3. Coordinating the availability of various financial options for design teams and schools

4. Demonstrating the performance benefits of high performance schools through pilot new construction and modernization projects

5. Collaborating with school facilities planning and approval agencies to institutionalize high performance design methods

9.2.4 Express Efficiency Program

The 2004-05 Express Efficiency Program is a statewide rebate program targeted to adoption of high-efficiency measures by businesses with electricity demands <500 kW. The program has been available to nonresidential customers throughout the state, in one form or another, for almost 10 years. The program only pays rebates for specific energy efficiency measures. Rebates are generally paid to customers within one month of completed installation paperwork. Payment is subject to utility verification of appropriate installation, at the utility's discretion.

9.2.5 Rebuild America

Rebuild America is a network of hundreds of community-based partnerships across the nation. The goals of Rebuild America are to save energy, improve building performance, ease air pollution and enhance the quality of life through energy efficiency and renewable energy technologies. The program provides schools with business, financing, and technical tools, such as guides, handbooks, software, workshops and referrals to state and local resources to help plan and execute a building retrofit project.

9.2.6 Savings by Design

Savings by Design is a program to encourage high performance non-residential building design and construction. Sponsored by four of California's largest utilities under the auspices of the Public Utilities Commission, Savings by Design offers building owners and their design teams a wide range of services such as:

- Design Assistance that provides information and analysis tailored to the needs of a project to help design more efficient buildings
- Owner incentives to help offset the costs of energy efficient buildings
- Design Team Incentives to reward designers who meet ambitious energy efficiency targets

Savings by Design seeks to improve the comfort, efficiency, and performance of buildings by creating a team approach to design.

9.2.7 School Resources Program

The School Resources Program (SRP), implemented by PG&E, provides an opportunity to foster energy efficient schools, an opportunity shaped by the need for major facility upgrades, rising energy costs, and the resources currently available to help school districts become more energy efficient. Despite opportunities, schools still experience barriers that can prevent them from taking advantage of available resources. Schools rarely have the in-house energy efficiency expertise or the staff resources to evaluate opportunities and take the necessary steps to utilize, coordinate, and manage the myriad of resources through the entire process of upgrading facilities to make them more energy efficient. The SRP helps K-12 school districts develop and implement district-specific energy savings plans. The SRP does so by assisting districts in identifying energy-efficiency upgrade opportunities, providing access to resources to implement energy-saving projects, and educating school district personnel, students, and parents about energy-related issues.

9.2.8 Standard Performance Contracting Program

The Standard Performance Contract (SPC) offers cash incentive payments for projects involving replacement of existing equipment or systems with new, high-efficiency equipment or systems. The program is available to projects involving commercial, industrial and agricultural customers.

Payment amounts are determined by the quantity of savings that result from installation of the new equipment or system.

10 School Management and Decision Making

Energy efficiency programs targeted at the schools market are concerned with two general categories of decisions, those made regarding curriculum and those regarding facilities. Below, we provide some very general guidance about how to approach school districts, depending upon the type of energy efficiency program one is promoting.

10.1 Facility Decisions

Restrictions present in the California Education Code, categorical aid funding restrictions, and previous empirical work suggest that districts will allocate similar shares of their dollars on particular spending categories. The education code, categorical aid programs, and collective bargaining agreements all lead to high minimum expenditures on classroom personnel and materials. The share of dollars devoted to expenditures on classroom personnel and materials is likely to be similar across districts, even though per-pupil spending may vary due to discretionary resources. On other categories of expenditure, which have a smaller base minimum level of expenditures required or where there are fewer restrictions governing the spending, districts may show greater flexibility in their design decisions. *For example, districts are likely to show more variation in the share and level of total expenditures they devote to maintaining school facilities, which have lower minimum spending restrictions and are more discretionary in nature.*

This greater discretion with respect to facility-related expenditures suggests that it is possible to get schools to at least consider adopting energy efficient equipment and building designs. That is, they do have some discretion to assume the higher first costs if the payback is reasonably short.

The focus in this section is on decision making in schools in general and decision making regarding capital expenditures in particular. While the local government's role in controlling education funding decisions has diminished, it is still at the local level that the allocation of resources for education ultimately takes place. The local school district remains the basic administrative unit of schooling. And, despite increased federal and state regulations that have developed throughout the years, practical realities of daily government and the belief in local control of education have kept education a fundamentally local enterprise. Placing restrictions on use is always a matter of degree, and what really matters is how the restrictions affect behavior at the local level.

At the local level, who are the key decision-makers typically involved in planning educational facilities? Castaldi (1994) mentions five key stakeholders:

1. The *school board* holds the ultimate decision making power for all school sites in a district.

2. The *chief administrator at the school* (the principal) has ultimate decision-making power at a specific school.

3. The *facility planner/operations manager* at the school typically oversees the entire planning and design process and acts as liaison to the school board and superintendents.

4. The *educational consultant* is responsible for assisting the architect in converting educational concepts into school facilities.

5. The *architect/engineer* has primary responsibility for translating educational concepts and functions into educational facilities conducive to learning.

The extent to which energy efficiency programs targeted to schools engage these stakeholders and assist them in overcoming the various market barriers they face (described earlier in Section 6) will determine whether opportunities to invest in energy efficiency will be taken.

11 Conclusions and Recommendations

In this section, we present our key conclusions and recommendations.

11.1 Savings Potential

The kWh and therms consumed annually by elementary and secondary schools in the four IOU service territories, while relatively small, represent important opportunities for energy efficiency and conservation. Table 11-1 summarizes this potential.

Table 11-1. Technical and Economic Potential for Elementary and Secondary Schools in California

	Technical Potential	Economic Potential
GWh	461.4	253.5
MW	119.3	48.8
Therms Millions)	45.6	5.2

Indoor lighting and water heating are the end uses that have the greatest kWh and therm savings potential, respectively.

11.2 Non-Energy Benefits

Although the kWh and therms consumed annually by elementary and secondary schools in the four IOU service territories are relatively small, one should not automatically assume that the *total* benefits are small. The assessment of non-energy benefits is critical to understanding the *full range* of benefits provided by school programs. They have a variety of uses:

- Benefit-cost analysis (using subsets or pieces of the NEB analysis)
- Marketing and targeting programs to provide maximum benefits and to ensure target groups receive sufficient benefits
- Marketing programs to appeal to participants based on the types of benefits that they actually value.

While the scope of this market characterization did not allow a thorough analysis of non-energy benefits within the school market, we encourage those responsible for developing energy efficiency programs for schools to more carefully document such benefits in future evaluations, since such benefits can be substantial.

11.3 Barriers

In the 2003-04 school year, there were 1,059 independent school districts in California with a total of 9,223 schools. While there are approximately 25 separate facilities or curriculum-based programs that promote energy efficient retrofits and curricula, there remain four key barriers that must be overcome.

- Information and Search Costs

- Performance Uncertainty
- Organizational Practices
- High First Costs

11.4 California's Schools, Students, Staff, and Facilities

11.4.1 Districts and Schools

In the 2003-04 school year, there were 1,059 independent school districts in California with a total of 9,223 schools. PG&E had 683 school districts in its service territory, accounting for nearly 65 percent of the school districts in California. In comparison, SoCalGas had 358 school districts, SCE had 249 school districts, and SDG&E had only 50 school districts[54].

11.4.2 Enrollment

While K-12 enrollment in California is expected to grow by four percent, there is considerable variation by county. There are 23 counties, scattered through the state, in which enrollment is expected to equal or exceed six percent. These higher than average growth rates (four percent) are projected for counties in the Central Valley, primarily served by PG&E, and for Riverside and San Bernardino counties, primarily served by SCE and SoCalGas. It is these counties in which school construction is expected to be the strongest over the next ten years. Areas where school enrollment is projected to drop include a number of rural counties in northern California, as well as San Francisco and San Mateo counties in the Bay Area.

11.4.3 Racial and Ethnic Background

There are some differences in the distribution of racial and ethnic groups in the public schools for the four IOUs. The Hispanic or Latino group represents 57 percent of the population in schools served by SoCalGas, 46 percent for SCE, 38 percent for SDG&E, and only 34 percent for PG&E. The White, not Hispanic group represents only 25 percent of public school enrollment for SoCalGas, 37 percent for SCE, 40 percent for PG&E, and 43 percent for SDG&E. The population classified as Asian represents over 10 percent of PG&E school enrollment but no more than 6 percent for the other three IOUs.

11.4.4 English Learners

All three IOUs serving Southern California were found to have more than 20 percent of the school districts with more than 80 percent of the students classified as English Learners. Such diversity has important implications for developing curriculum materials, particularly for the hard-to-reach population.

11.4.5 Teacher Experience

Teacher experience has been shown to be higher for higher performance schools. Teacher experience may also be an indicator of the willingness of individual teachers to incorporate innovative curricula into the classroom. There are many experienced elementary and secondary

[54] Numbers do not add to 1,059 due to overlapping service territories, particularly between SCE and SoCalGas.

teachers, credentialed in the life sciences and physical sciences, who could probably take advantage of the energy curricula available throughout the state.

11.4.6 Availability and Use of School Technologies

Student access to computers and the Internet have implications for the development of energy efficiency related curriculum materials. Within California, 48 percent of the schools have a student-to-classroom-computer ratio of less than five. More than 80 percent of the schools have a student-to-classroom-computer ratio of less than ten. Clearly, there are a fair number of schools with ratios that could support computer-based instruction regarding energy efficiency and conservation. In addition, over 95 percent of the schools also have some form of Internet access available for instructional purposes.

11.4.7 Facilities

The Office of Public School Construction (OPSC), the state agency that supports the State Allocation Board (SAB) in making funding available for modernizing and building safe and adequate school facilities, has reported a need for an additional 35,110 classrooms by 2009. In addition, the OPSC reported a need to modernize another 46,243 classrooms by 2009. The State of California's share of costs for these improvements are projected to require funding of over $16 billion, including $12.13 billion for new construction and $3.95 billion for modernization projects.[55]

The use of portable classrooms has increased as a way of quickly addressing overcrowding. Currently, there are approximately 80,000 portable classrooms being used in California, representing nearly 30 percent of all classrooms. A significant issue in assessing the quality of portable school facilities is the year the classroom was manufactured. A large proportion of portable classrooms (39 percent) are relatively new having been manufactured in 1996 or later. However, 28 percent of the portables are relatively old having been manufactured prior to 1985. The use of portable classrooms is expected to grow, although the rate of growth has been difficult for policy makers to determine.

The present need for new schools and modernization of existing schools provides numerous opportunities for a wide variety of energy efficiency programs targeted to both new construction and modernization. These programs, if properly designed, have the potential to capture important energy savings and non-energy benefits that have relatively long useful lives. These programs must consider the diverse conditions throughout California as well as the mix of traditional and portable school facilities

11.5 Finances

From the federal, state and local levels, there is a substantial amount of money remaining for new construction, modernization, and class size reduction. As of June 2004, the OPSC reported that $10.7 billion from all sources remained available for new applications. Over 99 percent of these funds are presently available under the School Facility Program. During the 2003-04 year,

[55] California Department of Education, 2005b.

the OPSC reported processing applications that total close to $2 billion. If OPSC continues funding at the rate of $2 billion per year, the remaining funds would be available through 2008.

While there are other sources of funding, it was difficult to determine the actual amount. Program planners should investigate each of these other sources to determine funding availability.

Finally, if the America's Better Classroom Act of 2005 is passed by the 109th Congress, the financing aspects would be similar to those of the QZAB program, but would promote construction of new schools. Additionally, as currently proposed, there do not appear to be eligibility restrictions similar to those of QZAB. If passed, the bill would provide $11 billion in 2006 and another $11 billion in 2007.

11.6 Curriculum- and Facilities-Based School Programs

There are at least 25 curriculum- and facilities-based energy efficiency programs targeted to elementary and secondary schools in California. Such diversity has led to a wide range of innovative programs. However, the targeting and delivery of these programs to California schools has not, up until now, been well coordinated. There are, however, some opportunities for synergies achieved through improved collaboration and coordination that could increase the energy and non-energy benefits delivered to California schools.

11.7 School Management and Decision Making

Energy efficiency programs targeted to the schools market are concerned with two general categories of decisions, those made regarding curriculum and those regarding facilities. Below, we provide some very general guidance about how to approach school districts, depending on the type of energy efficiency program one is promoting.

11.7.1 Facility Decisions

While the local government's role in controlling education funding decisions has diminished, it is still at the local level that the allocation of resources for education ultimately takes place. The local school district remains the basic administrative unit of schooling. And, despite increased federal and state regulations that have developed throughout the years, practical realities of daily government and the belief in local control of education have kept education a fundamentally local enterprise. Placing restrictions on use is always a matter of degree, and what really matters is how the restrictions affect behavior at the local level.

At the local level, there are five key decision-makers who are typically involved in planning educational facilities.

1. School board
2. Chief administrator at the school (the principal)
3. Facility planner/operations manager
4. Educational consultant

5. Architect/engineer

The extent to which energy efficiency programs targeted to schools engage these stakeholders and assist them in overcoming the various market barriers they face (described earlier in Section 1.5.3) will determine whether opportunities to invest in energy efficiency will be taken.

Appendix A

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Appendix B

Financial Data Codes

Fund	
code	**Title**
0-60 GOVERNMENTAL FUNDS	
01	General Fund/County School Service Fund
03	General Fund Unrestricted
06	General Fund Restricted
9 – 20 SPECIAL REVENUE FUNDS	
09	Charter Schools Special Revenue Fund
11	Adult Education Fund
12	Child Development Fund
13	Cafeteria Special Revenue Fund
14	Deferred Maintenance Fund
15	Pupil Transportation Equipment Fund
16	Forest Reserve Fund
17	Special Reserve Fund for Other Than Capital Outlay Projects
18	School Bus Emissions Reduction Fund
19	Foundation Special Revenue Fund
20	Special Reserve Fund for Post employment Benefits
21 – 50 CAPITAL PROJECT FUNDS	
21	Building Fund
25	Capital Facilities Fund
30	State School Building Lease-Purchase Fund
35	County School Facilities Fund

Fund	
code	**Title**
40	Special Reserve Fund for Capital Outlay Projects
49	Capital Project Fund for Blended Component Units
51 – 56 DEBT SERVICE FUNDS	
51	Bond Interest and Redemption Fund
52	Debt Service Fund for Blended Component Units
53	Tax Override Fund
56	Debt Service Fund
57 – 60 PERMANENT FUNDS	
57	Foundation Permanent Fund
61-70 PROPRIETARY FUNDS	
61	Cafeteria Enterprise Fund
62	Charter Schools Enterprise Fund
63	Other Enterprise Fund
66	Warehouse Revolving Fund
67	Self-Insurance Fund
71-95 FIDUCIARY FUNDS	
71	Retiree Benefit Fund
72	(Obsolete) Article XIII-B Fund
73	Foundation Private-Purpose Trust Fund
76	Warrant/Pass-Through Fund
95	Student Body Fund

Appendix C

Data Sources for Public School Districts and Schools and Private Schools

Data Sources for Public School Districts and Schools and Private Schools

Overview

The purpose of this appendix is to document the procedures used to develop IOU-specific information for public schools and school districts and for private schools. The following sections include a discussion of primary data sources, the mapping of public schools, public school districts and private schools to the major IOUs, and key features of the primary data sources.

Data Sources

The following three tables identify the data sources used to develop IOU-specific information. Each table identifies the topic, source, Internet site, files downloaded, and specific years for which data have been downloaded. For public schools, some data are available for the specific school while other information is only available by school district. For private schools, the available data are much more limited but do include data on site, school governance, enrollment, and number of teachers. In Table C-1, data available by public school are listed; the data used for this study include school site, school enrollment, race and ethnicity of students, teachers and other school personnel, and school technology. In Table C-2, data only available by school district are listed; the data used for this study include financial information by primary account reported by individual school districts. In Table C-3, the source for information on private schools is provided; the data used for this study include site location, grades served, and enrollment.

Table 1. Sources of Data for Public Schools

Topic	Source	Internet Site	Files Downloaded	Year of Data
Schools and School Districts	California Department of Education, "List of California Public Schools and Districts."	http://www.cde.ca.gov/ds/si/ds/pubschls.asp	pubschls.exe	2003-04
Enrollment	California Department of Education, "CBEDS School Information Form (SIF), Section B by School - School Enrollment."	http://dq.cde.ca.gov/DataQuest/downloads/sifenr.asp	student enrollment 0304 student enrollment 0405	2003-04 2004-05
English Learner	California Department of Education, "English Learner Students by Grade and Language," Language Census (R30-LC).	http://www.cde.ca.gov/ds/sd/lc/fileselsch.asp	Elsch04.exe	2003-04
Free/Reduced-Price Meal Data[56]	California Department of Education, "2003-2004 Free/Reduced-Price Meal Data."	http://www.cde.ca.gov/ds/sh/sn/freereduced0304.asp	Pdf files	2003-04
Certificated Staff	California Department of Education. "CBEDS Certificated Staff Profile."	http://www.cde.ca.gov/ds/sd/cb/filescertstaff.asp	prcert03.exe	2003-04
Teachers	California Department of Education. "Teachers by Subject Area and School."	http://www.cde.ca.gov/ds/sd/cb/filesteasch.asp	teasch02.exe	2002-03
Professional Staff	California Department of Education. "Teachers by Subject Area and School."	http://www.cde.ca.gov/ds/sd/cb/filepaif.asp	assign03.exe paif03.exe asgncode.exe	2003-04

[56] Aggregate data by district for report was obtained from http://www.ed-data.k12.ca.us. The data description from this source states "Free /reduced price meals (CalWORKs Report): Students enrolled in the program for free or reduced price meals. County social service offices for the whole attendance area report the students. Since some may attend private schools or have dropped out of school, the CalWORKs count may be slightly inflated."

Topic	Source	Internet Site	Files Downloaded	Year of Data
School Technology	California Department of Education. "CBEDS School Information Form (SIF), Sections G through L by School." Section H includes school technology information.	http://dq.cde.ca.gov/DataQuest/downloads/sifgl.asp	school technology 0304.tmp	2003-04

Table 2. Sources of Data for Public School Districts in California

Topic	Source	Internet Site	Files Downloaded	Year of Data
Schools and School Districts	California Department of Education, "List of California Public Schools and Districts."	http://www.cde.ca.gov/ds/si/ds/pubschls.asp	pubschls.exe	2003-04
School Finance	California Department of Education. "Current Expense of Education."	http://www.cde.ca.gov/ds/fd/ec/	costofeducation0203.xls (all districts)	2002-03
School Finance	California Department of Education. "Annual Financial Data."	http://www.cde.ca.gov/ds/fd/fd/	2003-04SACS.exe	2003-04
School Finance	California Department of Education. "Certificated Salaries and Benefits."	http://www.cde.ca.gov/ds/fd/cs/	j900304.exe	2003-04

Table 3. Sources of Data for Private Schools in California

Topic	Source	Internet Site	Files Downloaded	Year of Data
Private Schools	California Department of Education. "Private Schools."	http://www.cde.ca.gov/ds/si/ps/	privat03.xls privat04.xls prvtschlsca0304.doc	2003-04 2004-05

Mapping Public Schools and Public School Districts to IOUs

To develop information for each IOU, public schools located in each of the four IOUs service territories were identified. This identification process was based on a list of ZIP codes for each of the four IOUs ("ZIP-to-IOU mapping") and on the ZIP code associated with the public school site in the CDE's "List of Public Schools and School Districts" (pubschls.exe), which is part of CBEDS school database (See Table C-1). The ZIP-to-IOU mapping was based on previous work done by Ridge & Associates.

There are 2,345 unique ZIP codes in the pubschls.exe file. 124 ZIP codes (five percent of the 2,345 ZIP codes) were in the pubschls.exe file, but not in the ZIP-to-IOU mapping file. There are two primary reasons why one would not expect that all of the ZIP codes in the pubschls.exe file would be matched to a ZIP code in the ZIP code to IOU mapping. First, the four major IOUs do not serve all of California so there are some public schools that are located in California but not in the service territories of the four major IOUs. Second, some additional ZIP codes located in the service territories of the four major IOUs may have been added since the ZIP code to IOU mapping was completed; this situation could result in some public schools located in a major IOU service territory having a new ZIP code but not being identified with the appropriate IOU.

For the 124 ZIP codes not matched to one of the four IOUs using the ZIP-to-IOU mapping, the city for that ZIP code was identified and compared to the location of the city with the electric and natural gas service territory maps from the California Energy Commission (CEC) website. Based on this identification process, 40 of the 124 ZIP codes were determined to be located in areas not served by any of the four major IOUs. The remaining 84 ZIP codes were mapped to one or more IOU service territories based on their location.

With the ZIP codes in the pubschols.exe file now identified with IOUs, each school was assigned to one or more IOUs. Based on the assignment of schools to specific IOUs, school districts were assigned to one or more IOUs with one exception. The one exception is Los Angeles Unified School District (LAUSD). Since the majority of LAUSD schools are only located in SoCalGas's service territory, LAUSD was only assigned to SoCalGas. There is the potential that one or more LAUSD schools are served by SCE as well as SoCalGas. This exception for the assignment of school districts was made due to the disproportional size of LAUSD and the fact that most of the LAUSD schools are served by Los Angeles Department of Water and Power.

Following the procedures described above, a number of public school districts and public schools were assigned to more than one IOU. This overlap is due both to the fact the SoCalGas provides gas service to consumers in the electric service territories of both PG&E and SCE and to the fact that individual school districts (and potentially schools although that is not as likely and not addressed in this study) may receive electric or gas service from more than one utility.

Information on the extent to which individual school districts are assigned to more than one IOU is provided in Table 1-4. Of the 1059 school districts, 45 were not assigned to one of the major IOUs, 727 were assigned to only one IOU, and the remaining 287 were assigned to two or more IOUs. As would be anticipated given the overlap between SCE and SoCalGas service territories, all but 32 of the 249 school districts assigned to SCE were also assigned to other IOUs. Similarly, for SoCal Gas all but 85 of the 358 school districts assigned to SoCalGas were also assigned to other IOUs.

Table 4. Assignment of Public School District to Four Major IOUs

Source: CBEDS data; public school districts for 2003-04.

School Districts	California	PG&E	SCE	SDG&E	SoCalGas
Not Assigned	45				
Assigned to One IOU	727	570	32	40	85
Assigned to Two or More IOUs	287	112	217	10	273
Total	1059	682	249	50	358

Additional information on how the multiple assignments are allocated among the four IOUs is provided in Table 1-5. For example, of the 682 school districts assigned to PG&E, 570 are assigned to only PG&E, 12 are assigned to PG&E and SCE, 68 are assigned to PG&E and SoCalGas, 31 are assigned to PG&E, SCE, and SoCalGas, and 1 is assigned to PG&E, SDG&E, and SoCalGas. Of the 287 assignments to two or more IOUs, 166 are assigned to SCE and SoCalGas, 68 are assigned to PG&E and SoCalGas and 31 are assigned to PG&E, SCE, and SoCalGas. These account for all but 22 of the assignments to multiple IOUs.

As a general rule, the values reported for California are less than the sum of values across the four major IOUs. This difference results from SoCalGas serving public schools and public school districts served by other IOUs and from the relatively sparsely populated areas in California not served by at least one of the four major IOUs.

Table 5. Assignment of Public School Districts to Four Major IOUs with Overlapping IOU Identified

School District Assignment	California	PG&E	SCE	SDG&E	SoCalGas
Not Assigned	45				
Assigned to One IOU	727	570	32	40	85
PG&E and SCE	12	12	12		
PG&E and SDG&E	0	0		0	
PG&E and SoCalGas	68	68			68
SCE and SDG&E	2		2	2	
SCE and SoCalGas	166		166		166
SDG&E and SoCalGas	1			1	1
PG&E, SCE and SDG&E	0	0	0	0	
PG&E, SCE and SoCalGas	31	31	31		31
PG&E, SDG&E, and SoCalGas	1	1		1	1
SCE, SDG&E, and SoCalGas	6		6	6	6
Total	1059	682	249	50	358

Mapping Private Schools to IOUs

To develop information on private schools for the four IOUs, similar procedures were used. The ZIP code for the site of each private school was obtained from the site address provided in

privat04.xls and privat03.xls (Table 1-3). These ZIP codes were matched to IOU using the ZIP-to-IOU mapping file. There were 3,751 private schools in the initial list. Of these schools, a total of 21 schools were not assigned to one or more of the four IOUs. These 21 schools with a reported enrollment of 2,058 students represented less than 0.6 percent of the schools in the CDE list with an enrollment of less than 0.3 percent. The specific reason for why these schools were not matched to one or more of the IOUs was not investigated.

Data for Public Schools

As noted in Table 1-1, the data for public schools include data for public school districts, public schools, students, personnel, and technology. Most of these data are collected from schools in mid-October of each year. The data are provided on the CDE website using multiple tables within a database. When tables are merged using a primary variable (or variables), such as school district, some records may not have a match between the two tables. As a consequence, some records will inevitably be dropped (or if retained will not include values for variables obtained from the file for which there was not a match). The dropping of records may affect the accuracy of the information developed since some information will not be included for a specific public school district or school. This is a particular problem if a number of records are dropped and if there is some systematic reason for why records are being dropped.

To assess the extent to which the dropping of information affects the results for this study, information available in the CDE's *Fact Book 2005* is compared to information developed from the CBEDS database. *Fact Book 2005* provides descriptive statistics on number of schools and enrollment for California, and, in certain cases, for specific counties and for specific public school districts. The CBEDS database was used to develop the same information as provided in *Fact Book 2005* on number of public schools and enrollment for California. The total number of schools and total enrollment developed using the CBEDS database is slightly less than the totals provided in *Fact Book 2005*. Using the CBEDS database, we found 40 fewer public schools with corresponding enrollment of 34,235. Compared to statistics in *Fact Book 2005*, less than 0.5% of the population (as defined by enrollment) was dropped in our analysis.

How this information is collected from individual school districts, including instructions to school districts, is available from the Department of Education's Internet site (http://www.cde.ca.gov/ds/sd/cb/documents/admin05.pdf). Specific instructions may influence the extent to similar information is directly comparable. For example, instructions on how to report racial/ethnic designations for this coming 2005-06 school year differ between students and certificated staff. In reporting on the racial and ethnic backgrounds of students and certificated staff, the following instructions are given:

> "The racial/ethnic designation which most closely reflects the individual's recognition in the community should be used for the purposes of the report. For student enrollment, report each student in only one designation. For each certificated staff, the district may report one or more racial/ethnic designation(s). (p. 12)

As a consequence, certificated staff may report themselves as having more than one racial/ethnic designation while student designations do not allow for multiple designations.

Financial Data

As noted Table C-2, annual financial data are available for public school districts in California on the CDE website in the new Standardized Account Code Structure (SACS). As described, data are provided for both revenues and expenditures by school district. The SACS statewide accounting system for schools contains close to 1.5 million records in the main table. There are six primary supporting tables (i.e., tables that provide the description to the codes used in the main table).

The main table consists of 13 variables: County Code, District Code, School Code[57], Fiscal Year, Report Period Identifier, SACS Account Code, SACS Fund Code, Project Year (for federally funded projects), SACS Goal, SACS Function, SACS Object Code, and Amount. For our analysis, we focused on the amounts by fund (SACS Fund Code) and object (SACS Object Code) for each district. This database contains no address information but does include County Code, District Code, and School Code variables.

To develop IOU-specific information, a multi-step process was followed. First, the County Code, District Code, and School Code variables from the SACS file were matched to corresponding information in the pubschls.exe file. A ZIP code was thus assigned to each School Code. Second, the file with County Code, District Code, School Code and ZIP code was merged with data extracted from the SACS database. These extracted data were merged using the County Code, District Code, and School Code variables. Third, public school district information extracted from the SACS file was then allocated to each of the four IOUs using the ZIP-to-IOU mapping.

As all the data from the SACS used in this analysis are for fiscal year 2003 (July 2003-June 2004), the fiscal year variable has not been used. The account code is a concatenation of the fund, resource, project year, goal, function, and object codes and has also not been used.

The fund code (SACS Fund Code) played a large part in the analysis for this report. According to the manual for SACS, a fund is an accounting entity with a self-balancing set of accounts recording financial resources and liabilities. The fund field applies to revenue, expenditure, and balance sheet accounts. In order to assure that the information is being interpreted correctly, data queries from the SACS data were compared to the financial data for a single district. The data for the individual school district for this comparison were available on the Internet at www.ed-data.k12.ca.us. The data for the individual school district were limited to the revenues and expenditures in the General Fund only (fund code = 01). The totals for the General Fund obtained using the SACS data were equal to those found on the website for the single district.

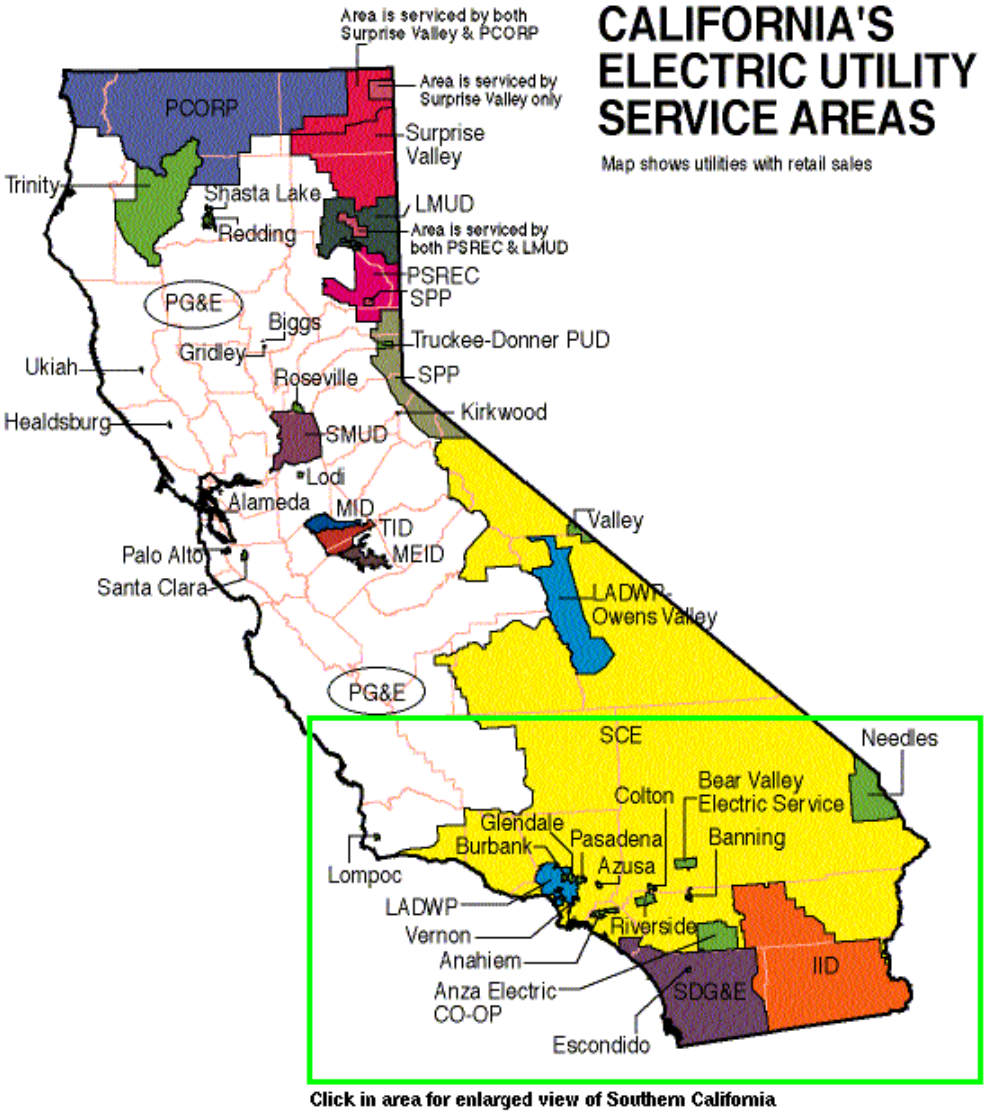
The total funding for K-12 in 2003-04 was $55.7 billion (CDE's *Fact Book 2004)*. This funding is from all sources and for all purposes. However, much of data presented in our report is for funding for the General Fund (i.e., the operating expenses of the district). When information from other funds is presented, we have so noted.

[57] While School Code is included in this table, it is somewhat misleading to think that the financial data is available at the school level. Of the 1,462,471 records used in our analysis, 99.7% of them contained data for the district level only. We assumed that the other 0.3% of the records had a school code inadvertently entered.

Appendix D

IOU Service Territory Maps

Figure F-1. California's Electric Utility Service Areas in 1996



Source: California Energy Commission (2005). www.energy.ca.gov/maps/utility_service.html

Abbreviations used:

CSC (Santa Clara Electric Dept.)
IID (Imperial Irrigation District)
LADWP (Los Angeles Dept. of Water and
LMUD (Lassen Municipal Utility District)
MEID (Merced Irrigation District)
MID (Modesto Irrigation District)
PCORP (PacifiCorp)
PG&E (Pacific Gas & Electric)
PSREC (Plumas-Sierra Rural Electric
SCE (Southern California Edison)
SDG&E (San Diego Gas & Electric)
SMUD (Sacramento Municipal Utility
SPP (Sierra-Pacific Power)
TID (Turlock Irrigation District)

Figure F-2. Map of California Natural Gas Utilities Service Areas

Source: California Energy Commission (2005): www.energy.ca.gov/naturalgas/gasmap.html