2004-2005 Green Schools Programs Evaluation

Implementer: Alliance to Save Energy

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Program Background

In 2004-2005, the Alliance to Save Energy (Alliance) implemented the Green Schools Program in PG&E, SCE, and SDG&E service territories.

- ***Program Objectives:***
  - To reduce energy costs and energy waste in schools
  - To strengthen students' understanding of the link between energy and the environment
- ***Program Design:***
  - Information-only
  - Provides schools with variety of energy conservation information:
    - Energy-efficiency education curriculum materials
    - School and community-based activities
    - Recommends no-cost behavioral and operations changes
  - Emphasizes cooperative approach
    - Brings together facilities, instructional, and administrative staff members

Evaluation Overview

- Market Characterization
- Process Evaluation
- In-depth Family Interviews
- Review of Program Results

Market Characterization - Overview

- 74 telephone interviews with key district stakeholders

- Statewide Characterization of Elementary and Secondary (K-12) across all four IOUs
  - Assessed past and current involvement in EE programs
  - Assessed barriers to participation
  - Identified strategies for, and interest in, participating in EE programs
  - Assessed extent to which energy is incorporated into the curriculum
  - Identify strategies for, and interest in, adopting new energy efficiency curricula

Market Characterization - Results

- 53% of schools have participated in a facilities retrofit program within the past five years

- Relatively low saturation for curriculum-based programs such as Green Schools (12%)

	CA		PG&E		SCE/SCG/SDG&E	
	N	% Yes	N	% Yes	N	% Yes
Curriculum-Based Program	9	12%	4	10%	5	15%
Facilities Retrofit Program	39	53%	19	48%	20	59%
New Construction Program	12	16%	3	8%	9	26%
None	29	39%	19	48%	10	29%
Another Type of Program	2	3%	1	3%	1	3%

Note: Percentages add to more than 100% since multiple responses were allowed.

Market Characterization - Results

- 43% of the respondents indicated that programs should first contact the superintendent

- Alignment of materials with state standards (28%), teacher time/ease of use (17%), and cost/cost effectiveness of the programs (12%) identified as most important motivators to participation

- Over 90% of respondents expressed interest in participating in various types of facility- and curricula-based programs in future

Stakeholder Workshop

- ***Program Goal:***
  - Affect long term behavior by developing energy stewards and stewards of the environment
- ***Program Theory:***
  - Employ a strategy that uses materials/activities that can be integrated into the existing curriculum and across nearly all subjects
  - Effectively train teachers how to change student perceptions and behaviors towards energy and the environment
  - Use hands-on activities that encourage student participation and active learning to engender lasting effects

Stakeholder Workshop

- ***Barriers***:
  - Need buy-in at multiple levels (superintendent, principal, and teacher)
  - Lack of incentives and recognition to engage students and reinforce the relevance of energy efficiency
  - Difficult to teach about energy - "invisible" and "abstract"
- ***Program Elements Supporting Program Goals and Addressing Barriers:***
  - Teacher Training
  - Hands-on and age appropriate lessons and materials
  - Supportive local program facilitators and working closely with teachers and school facility staff
  - Recognizing student achievements

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  - Recognizing student achievements
- ***Measuring Success:***
  - More documentation needed to demonstrate program impact

In-depth Family Interviews

- ***Methodology/Interview Design:***
  - To determine what the students learned about energy and energy efficiency
  - Questions focused on:
    - Students' awareness and knowledge of energy efficiency pre- and post-Program participation
    - Whether students have made any behavioral changes as a result of lessons learned
    - Whether students have talked to their families about energy efficiency
    - Parents and siblings were also asked about any impacts they have experienced as a result of their child/sibling's participation in the Program, as well as any changes they observed in the behavior of the participating student

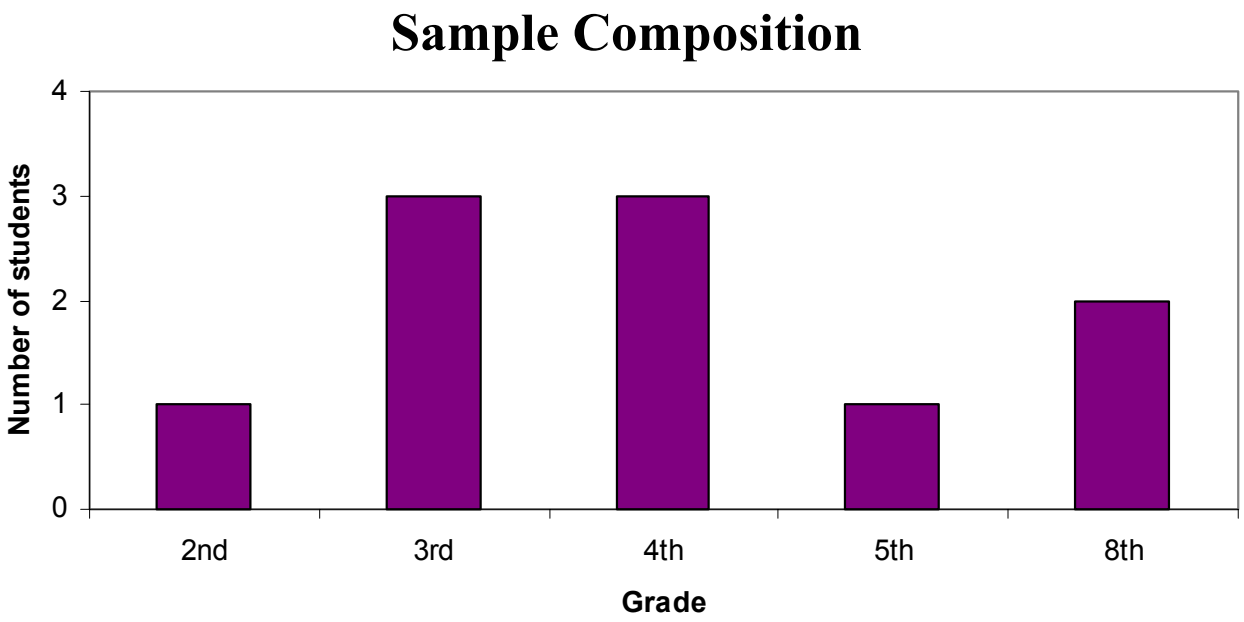
In-depth Family Interviews

Sample Composition

- Ten students (from nine families)
- Case study, results not representative of Program impact as a whole
- Interviews focused in San Francisco Bay Area to limit costs

School	School Type	City	No. Students Interviewed
Hacienda Elementary	First-Year Participant	San Jose	1
Manor School	Graduated Participant	Fairfax	2
Petaluma Junior High School	Second-Year Participant	Petaluma	2
Vallecito Elementary	First-Year Participant	San Rafael	4
Miller Creek	First-Year Participant	San Rafael	1

In-depth Family Interviews



In-depth Family Interviews

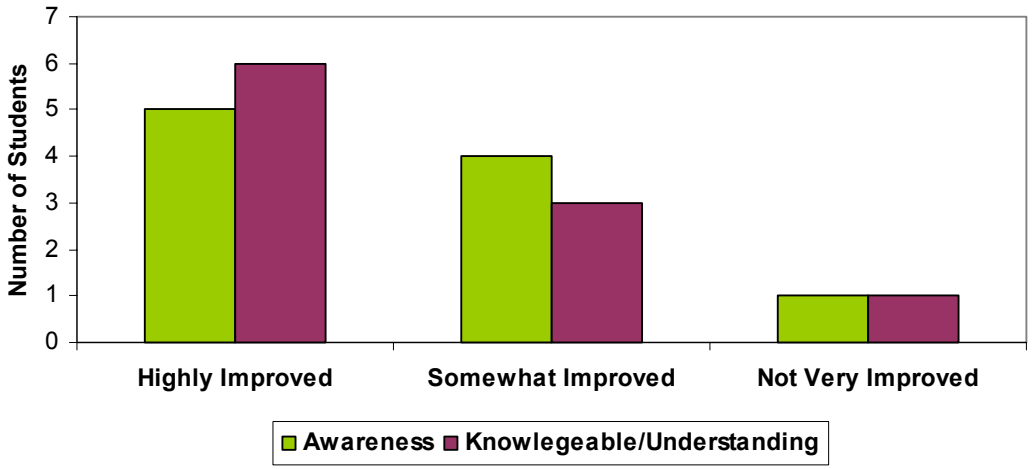
Results (n=10)

- Student Experience
- Student Action
- Sibling and Parent Experience

In-depth Family Interviews

Student Experience

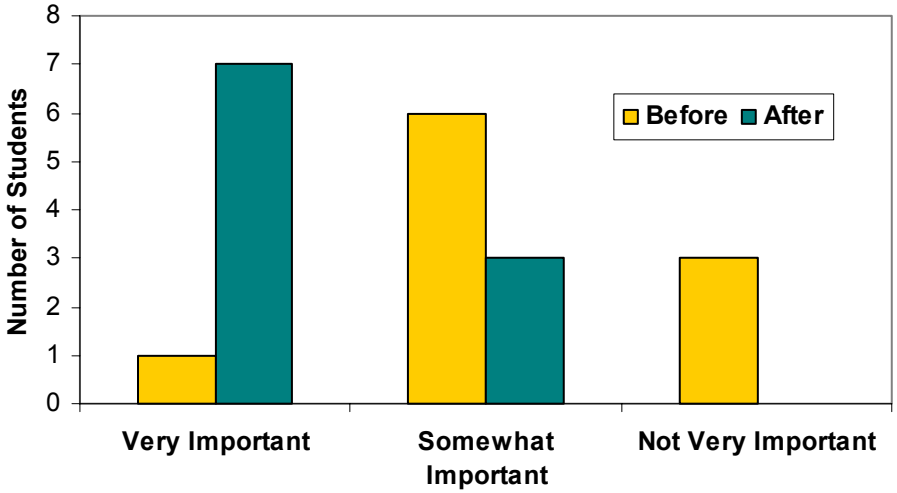
- ***Awareness and knowledge/understanding of energy efficiency***
  - *Before* participation, 3 "Somewhat Knowledgeable," 4 "Not Very Knowledgeable," 3 "Not At All Knowledgeable"
  - *After* participation:



In-depth Family Interviews

Student Experience

- Perceived Importance of Energy Efficiency before and after Program Participation



In-depth Family Interviews

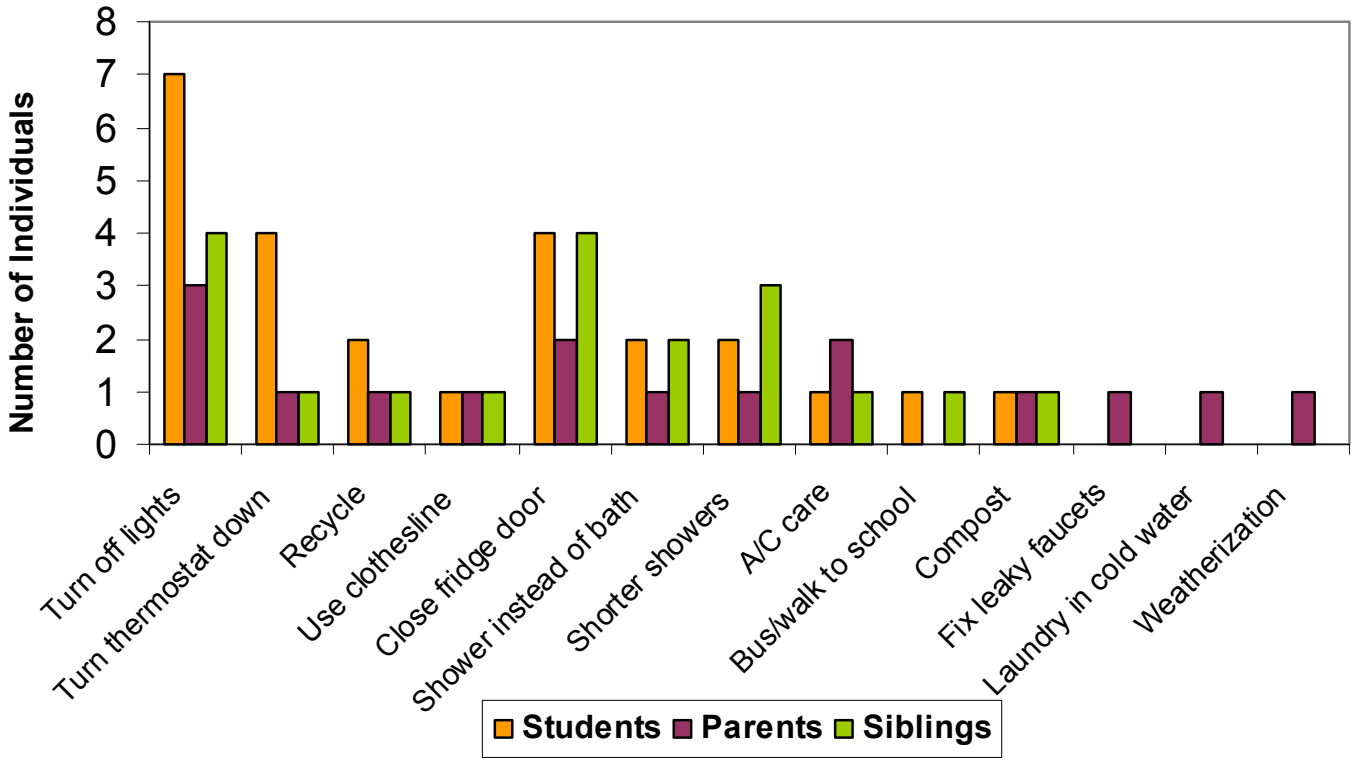
Student Action (n=10)

- Eight students took action at school, including:
  - Energy patrols (6)
  - Installing faucet aerators (1)
  - Turning lights off on sunny days (1)

In-depth Family Interviews

Student Action at Home (n=10)

- Eight students took action at home, including:



In-depth Family Interviews

Sibling and Parent Experience

- Sibling Impacts and Observations
  - When the siblings were asked if the participating student had taught them some of the things they had learned, five of the six siblings interviewed said they had.
    - Responses included being more conscious about closing the refrigerator door, turning off lights, not wasting water, taking shorter showers, and not littering
  - Four of the five responsive siblings noted that they had observed a change in the behavior of their brother/sister at home with regard to their energy usage
    - Examples again included increased diligence in turning off lights when rooms are not in use and water consciousness. Perhaps one of the more telling remarks came from a sibling who was unable to provide a specific, but offered, "I don't know, but he talks about it all the time."
  - Lastly, the siblings were each asked how important they thought it was to pay attention to energy efficiency after their brother or sister's participation in the Program. Four of the responsive siblings thought that it was "Very Important" to pay attention to energy use at home, while two felt that it was "Somewhat Important."

In-depth Family Interviews

Sibling and Parent Experience

- Parent Impacts and Observations
  - Changes in child's awareness and/or behavior?
    - With the exception of one parent who noticed a change only in his child's awareness, all the parents indicated that they noticed a change in both the energy efficiency awareness and the behavior of their child
  - Analyze energy bills?
    - Four of the eight parents had examined their energy bills prior to the Program, with one additional parent analyzing bills after the Program. One parent noted that their water bill had come down, and one had noticed lower electric and gas bills

"We didn't realize how easy it is to install low-flow shower heads; conserving water is important, we are on a well and it is possible to run it dry."

"I think it's good to start kids young with these concepts. Adults are harder to change."

"We are now seeking out other information, like making smoothies with a bicycle."

Review of Program Results

- Disparity in savings between SCE and SDG&E service territories

- Modified workplan to explore…
  - Review Existing Utility Manager (UM) Inputs, Analyses, and Results
  - Recommendations for Improved Data Collection

- Issues:
  - Data – quantity and quality
  - Weather-Calibrations

Review of Program Results

- Difficult to ascertain exact reason for difference
  - Behavioral savings can be exaggerated or obscured by larger exogenous factors

- Recommendations:
  - Establish on-site contacts for information regarding changes in physical structure or operation of school that may impact UM analysis
  - Make monthly reports of program activity mandatory (develop database)
  - Further revised reports to improve:
    - **Clarity**: Put emphasis on program-induced "change"
    - **Specificity**: Gather more detailed information – provide units (number of classrooms, sq. ft. or degrees) to improve data quality
    - **Focus**: Concentrate specificity on actions generating greatest energy impact and that lend themselves to quantification