

# Rebuild Hawaii Energy Smart Schools 2002

## Final Report

**Prepared for: State of Hawaii  
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Economic Development and Tourism  
Energy, Resources and Technology Division**

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# Rebuild Hawaii Energy Smart Schools 2002

## **Executive Summary**

The Energy Smart Schools 2002 is a Rebuild Hawaii project managed by Hawaiian Electric Company, Inc. (HECO). The purpose is to teach high school students about energy, energy conservation and to provide the experience of real-life work scenarios by performing energy audits in school buildings and neighboring small businesses. The project was developed through a Rebuild Hawaii partnership to increase energy awareness in Hawaii's public schools and small businesses. The partnership includes the State of Hawaii Department of Business, Economic Development and Tourism (DBEDT), the U.S. Department of Energy (U.S. DOE) and Hawaiian Electric Company, Inc. and is sponsored by the Rebuild Hawaii Consortium. The Energy Smart Schools classes were held at McKinley High School and Radford High School, in Honolulu, on the island of Oahu.

The Energy Smart Schools 2002 was built on the foundation of two successful projects preceding it. The first Energy Smart Schools session, similar to the 2002 project, took place during the 2000/01 school year on Oahu. Simultaneously, the Maui Smart Schools project was being implemented which involved all Maui public schools' fluorescent lighting being audited and benchmarked.

Energy Smart Schools 2002 (completed in 2003 school year) is a multidisciplinary energy conservation project designed to incorporate hands-on math, science, and computer, marketing, advertising and public speaking instruction. A single dedicated Energy Smart Schools instructor and several industry professionals worked with the students once a week for 2 semesters.

Students were taught how electricity is produced and distributed via classroom lessons and excursions to HECO's Kahe Power Plant. They learned how to conduct energy audits using state-of-the-art auditing devices and by applying critical thinking, problem solving and decision-making skills. They identified the need for their schools to utilize energy more efficiently, to save money and to improve the quality of the lighting by retrofitting their T12 fluorescent lighting systems (with magnetic ballasts) to energy efficient T8's with electronic ballasts.

In addition to learning new computer software techniques, students developed self-confidence and presentation skills by demonstrating the benefits of lighting retrofits in school buildings to their peers, teachers, PTSA, DBEDT and U.S. DOE officials and HECO personnel via an oral / Power Point presentation.

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**Schools Lighting Audit Results**

<b>School</b>	<b>Enrollment</b>	<b>Annual Energy Savings After Retrofit</b>	<b>Annual Cost Savings</b>
Radford High School	1300	107,000 kWh	\$13,000
McKinley High School	1883	178,000 kWh	\$22,500
<b>Total</b>	<b>3183</b>	<b>285,000kWh</b>	<b>\$35,500</b>

*After auditing their schools, students calculated the potential energy and cost savings that T8 lighting retrofits would achieve.*

The students learned the relationship between math and science applications of energy audits and took their knowledge and skills to the private business sector. They increased community awareness of energy conservation and energy efficiency in Hawaii by performing energy audits at small business sites. Before contacting the businesses, class time was spent learning about marketing and advertising procedures and students developed business presentation skills. The students called on neighborhood businesses using advertising flyers and calling cards. They presented the Energy Smart Schools project to business owners, and received invitations to conduct lighting audits at the stores and offices. The young auditors recommended retrofitting T12 fluorescent lamps and magnetic ballasts with energy efficient T8 lamps and electronic ballasts. After calculating the results of the audit using actual HECO energy calculations and rebate information, real material and labor costs, the students presented their findings to the small businesses.

**Additional Accomplishments**

- Radford High completed their school's lighting retrofit before the end of 2003.
- To date, seven private businesses retrofitted their operations based upon the statistics provided by the students and HECO.
- Two of the McKinley students built a lighting exhibit for the schools' science fair. The exhibit, named "*How Can T8's Save Electricity and Money at M.H.S.*" won and advanced to compete in the State Science Fair (Appendix 10-2).

The students completed the class having gained knowledge of electricity, compassion for energy conservation and self-confidence through oral presentations and interpersonal relationships with other students, adults and business executives.

Funding for the Energy Smart Schools project was provided by HECO and Rebuild Hawaii, a U.S. Department of Energy consortium that facilitates energy-saving programs.



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## **Introduction**

The Rebuild America Program of the U.S. Department of Energy encourages K-12 educational programs to conduct energy conservation studies and encourage implementation. Hawaiian Electric Company, Inc. (HECO), with support from Rebuild Hawaii and the State of Hawaii Department of Business, Economic Development, and Tourism (DBEDT) and the Rebuild Hawaii Consortium, initiated the Energy Smart Schools 2002 project.

The Energy Smart Schools 2002 project goal was to build on the existing and emerging awareness of T8 lighting efficiency and increase lighting retrofits in public schools and private small businesses while simultaneously giving high school students hands-on training in the fields of energy management (specifically lighting), business, marketing, advertising and computer technology.

65 students participated in the 2-semester long (2002/2003 school year) Energy Smart Schools project. The classes were held at McKinley High School and Radford High School, in Honolulu, on the island of Oahu.

The Energy Smart Schools 2002 project accomplished the following:

- Obtained participation from 2 public high schools;
- Developed marketing pieces to inform teachers about the project, and prepared an educational syllabus; Each class had to demonstrate its parallel value to the Hawaii State Educational Standards for science and technology;
- Conducted 2-semester long workshops for high school students;
- Assisted students with determining no-cost/low-cost energy measures in their homes and at school;
- Taught students basic energy concepts;
- Led teachers, instructors and students in educational tours of a power plant
- Trained students in lighting audit skills;
- Educated students to use state-of-the-art lighting audit technology/equipment
- Assisted students with the practical application of lighting audit concepts within their high schools;
- Taught students to use popular business software;
- Conducted presentation skills lessons;
- Assisted students with developing an oral presentation for the school administration and industry leaders discussing the school audit results;
- Informed schools about the energy and cost savings available to them by retrofitting their fluorescent lights to T8's with electronic ballasts;
- Conducted business etiquette and practical marketing skills lessons

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- Prepared marketing flyers, calling cards and leave-behinds to solicit the student auditing services;
- Coordinated 20+ small businesses to perform energy audits;
- Gave the schools groups \$1000 total for conducting the small business lighting audits.
- HECO videotaped Energy Smart School classes, the students' school library audits, their presentations and small business audits. Resource to be used as training lessons and as Energy Smart Schools infomercials edited by HECO and broadcast during the HECO Electric Kitchen television cooking show.
- Opened doors to the Board of Education and Dept of Accounting and General Services to invite HECO and Smart Schools instructor to discuss the classroom program and school lighting retrofit analysis to Vice Principals during School Repair and Maintenance planning sessions.
- HECO project manager worked extensively with 18 Oahu schools at the end of 2003 to inspect and verify T8 lighting retrofits were completed for utility rebate payments.
- Between 2000 and 2003, approximately 72 Oahu public schools received HECO rebates for retrofitting their lights to T8 lamps with electronic ballasts.

The classes followed this instructional format:

Energy Study → School Audits → Learn New Computer Software → Oral and PowerPoint Presentations → Marketing & Sales → Small Business Audits.

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### **1. High School Participation**

#### **Solicitation to Schools**

HECO developed a marketing flyer to solicit school participation in the Energy Smart Schools project (Appendix 1-1). HECO distributed the flyer to public high schools on Oahu. Developed especially for a narrow, targeted market, the flyer explained the background, purpose, and rewards of the Energy Smart Schools project.

#### **Workshop Syllabus**

To prepare a 20 week class syllabus, HECO investigated energy awareness programs currently being used in schools across the nation. Some of these programs provide quality, free materials on the Internet. HECO used lesson plans and worksheets from the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EREN) and Alliance to Save Energy (Alliance). The website addresses are: **<http://www.eren.doe.gov/energysmartschools>** and **<http://www.ase.org>**. Much of the material used was duplicated from the first Energy Smart Schools program conducted in 2000.

HECO modified and updated the existing Energy Smart Schools syllabus of workshop activities to share with the teachers (Appendix 1-2). The 2002/3 session required HECO to include the value of each lesson content as it related to the new Hawaii State Education Standards required by the Department of Education. The Standards categories included Social Studies, Language Arts, Career & Life Skills, Science and Math.

#### **Project Adoption by Schools**

The first two schools to sign up with a Letter of Commitment by the teacher and principal were Radford High School and McKinley High School. An initial letter of intent indicates the schools' intent to participate and be considered for the program and another form solidifies the school's commitment. (Appendix 1-3 and Appendix 1-4).

HECO met with both teachers to schedule workshop times that would work with the different schools' schedules. It was left up to the teachers to determine if they wanted to have workshops after school in a 'club' format, or during the regular school day. Both teachers choose to hold the workshops one period a week, during the regular school day. One teacher selected a Biology/Physics class and the other choose a Physical Science class. Each class, or workshop, lasted approximately 45 minutes.

#### **Student/Parent Flyer**

After the school's adoption of the program, a flyer was distributed to the class to interest the children in the special training they could look forward to and also to inform their parents about the special project their children were going to undertake (Appendix 1-5). With the future video taping and photography planned, an important first order of business is obtaining the parent's permission on the Photo Release documents (Appendix 1-6).

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## **2. Workshops**

An Energy Smart Schools instructor/coordinator dedicated to this course through HECO and Rebuild Hawaii, and reporting directly to HECO, prepared every lesson plan, conducted the in-class lessons and training, coordinated the professional workshops, tours and presentations. HECO staff and other Rebuild Hawaii members conducted the professional workshops. The Energy Smart Schools instructor managed coordinating the school staff, office administration, custodial personnel and the librarians to organize the on-site instructions and audits.

### **Professional Workshops**

Following is a brief description of the workshops led by industry professionals. See Appendix 8-1 to review instructor's Weekly Evaluation Reports.

#### **A. Professional Workshop – Introduction to Energy and Electricity**

Two electrical engineers from HECO's Energy Services Division instructed students on energy conservation, electrical generation, electrical delivery and consumer utilization.

Students learned where the 6 major generators are on Oahu and the 4 types of generators working on the island (oil fired boilers, coal fired boilers, garbage fired boiler and oil fired combustion turbine).

They discussed the delivery system, from transmission lines to substations, to distribution lines, transformers to metered home service.

The workshop reviewed the items utilizing electricity in the home and office and covered the importance of choosing high efficient appliances and turning lights and electronics off when they are not needed.

One of the HECO Engineers showed students a demonstration of a hydrogen fuel cell model, and the future applications of the technology.

#### **B. Professional Workshop – Discovering the Different Types of Lighting**

HECO's Customer Efficiency Program Analyst presented the differences and similarities of different types of lighting found at home, at school, in offices and in retail establishments. In this workshop, students are introduced to the different lighting fixtures they will encounter when conducting lighting audits. The emphasis of this workshop is that there are energy efficient lighting choices that everyone can make, no matter where he or she are; home, work or school.

#### **C. Professional Workshop – Power Plant Tour**

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Each school was given private tours of the Kahe Power Plant in Waianae. Students viewed a general introductory video and participated in a preliminary tour lecture. HECO Plant Managers and Foremen divided the students into small groups and showed them the fuel oil tank, furnace, boiler, stack, steam turbine, generator condensation pump and circulating water pump.

For samples of Power Plant Tour forms see Appendix:

HECO Power Plant Rules (2-1)

Adult Liability Waiver (2-2)

Student Participation and Parental Approval Form (2-3)

Hawaiian Electric engineers provided students with a study guide for the Kahe Power Plant detailing basic facts, the cycle of the major components and a schematic drawing (Appendix 2-4).

### **D. Professional Workshop - Student Marketing and Presentation Skills**

HECO's Energy Smart Schools Project Manager conducted a workshop on advertising, marketing and presentation skills.

The lecture included basic advertising design, marketing strategies and presentation techniques to gain involvement from businesses. The HECO manager developed and implemented HECO's national, award-winning Energy Solutions for Small Business project (a Rebuild Hawaii project that markets energy efficiency to small businesses on Oahu.) The class covered creating flyers/brochures to motivate neighborhood businesses to allow the students to conduct energy audits in their workplace. The students designed a special window sticker to give to each of the businesses they worked with. This sticker was a leave-behind for the small business to apply on their window to show support of the students and neighboring school. Audit presentation forms, flyers and brochures used in the Energy Solutions for Small Business project were given to the students for their individual modifications.

The HECO project manager worked with the students in preparing their telephone presentation speech to obtain the first meeting with the small business owner. Students were also counseled on business etiquette such as handling telephone rejection from cold-calls, how to dress for a meeting, how to greet a potential customer and general business conduct tips.

### **E. Professional Workshop – Lighting Retrofit Company**

Darren Kimura, President of Energy Conservation Hawaii, an electrical engineer, Certified Energy Manager, former National Young Entrepreneur of the Year recipient, Eagle Scout and a Rebuild Hawaii member, discussed various job opportunities in the lighting industry depending on the individual's personality, skill and education.

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Emphasis was placed on the importance of a college education to further succeed in a career path.

### **Workshop Weekly Evaluation Reports**

To facilitate future projects and for the ease of replication, detailed reports covering the workshop activities (professional and institutional) and recommendations for changes in future workshops were kept on a weekly basis by the Energy Smart Schools instructor (Appendix 8-1).

### **Workshop Instructional Materials**

Material from EREN and US Department of Energy were utilized in the classrooms. Actual auditing and calculating documents used in HECO's Energy Solutions for Small Business lighting retrofit program were studied and implemented by the students. Other worksheets and handouts were produced specifically for the students in this project.

A. Worksheets from EREN Internet site <http://www.eren.doe.gov/energysmartschools> (Appendix 2-5).

- *Pre Test*

Worksheets from the U.S. Department of Energy *Get Smart About Energy?*

CD-ROM orders available through the US DOE website:

<http://www.energysmartschools.gov/energysmartschool/order.html>.

#### Worksheets and Handouts

- *Knowing the Meaning of Electrical Terms (2-6)*
- *Bright Ideas (2-7)*
- *Anatomy of a Light Bulb (2-8)*
- *Energy Saving Suggestions (2-9)*
- *Home Appliance Survey (2-10)*
- *Home Appliance Use (2-11)*
- *Wattage Ratings (2-12)*
- *How to Read Your Meter (2-13)*
- *Meter Reading Worksheet (2-14)*
- *Daily Use of Electricity In My Home (2-15)*
- *Appliance Energy Use (2-16)*
- *Light Type Information Guide (2-17)*
- *Lighting Survey Sheet (2-18)*

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Instructional material from HECO:

- *Energy Tips and Choices – booklet (2-19)*
- *Conducting A Lighting Audit (2-20)*
- *Lighting Equipment Survey (2-21)*
- *How to Enter Data in Excel (2-22)*
- *HECO T8 Lighting Services Worksheet (2-23)*
- *Types of Lighting Fixtures from Maui Smart Schools (2-24)*
- *High School Electricity Use Calculation Chart( 2-25)*
- *History of School Electricity Use (2-26)*
- *Appleworks Basics( 2-27)*
- *Creating a PowerPoint Presentation (2-28)*
- *Student Presentation on School Audits (Preparation) (2-29)*
- *Lighting Equipment (Energy saving recommendations from Maui Smart Schools) (2-30)*
- *Quiz #1 (2-31)*
- *Quiz #2 (2-32)*

### **Classroom and Field Work Material**

Hands-on learning was very important in this program so a variety of state-of-the-art ‘field-work’ equipment or material, were used in the classroom as well as during the lighting surveys. The students were not allowed to touch the fixtures at any time. Industry professionals and the school custodians demonstrated the internal components of the lighting fixtures.

Using the digital camera and laptop, the students took pictures of the material and loaded it into the computer for inclusion in this report. Descriptions and photos of the field-work equipment can be found in Appendix 2-33. Some of the equipment included:

- Laptop computer
- Portable printer
- Digital camera
- Light meter
- Lighting loggers
- Flicker checkers
- Pocket monocular
- Various motor supplies
- Ladder
- KW meter
- Screwdrivers
- Small pliers
- T8 and T12 lamps and hardware

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- Misc. CFL
- Electrowizard Inventions Kit
- GE Lighting display depicting color renderings
- GE Lighting display exhibiting differences between T8 and T12 lighting

### **3. School Lighting Audit Training and Material Implementation**

#### **Training - Lighting Survey Materials**

Students learned how to use lighting survey materials to conduct the lighting audits. They used flicker checkers to determine if the ballasts were magnetic or electric. Light meters were used to take readings on the amount of light output from fixtures. Students also learned how to use lighting loggers to log data on burn hours. If a closer look at a fixture or lamp was needed, students used a monocular to help them see the fixture. A digital camera was used to take pictures of light fixtures in the schools, students using the equipment and participating in activities. Students used the digital photos in their school presentations and are included in this report.

#### **Training – Conducting Lighting Audits**

The Energy Smart Schools students were taught how to conduct lighting audits in their schools. They completed lighting audits in their classrooms and once they were comfortable with that skill level, they began to audit the library and administration buildings. Working together in small groups, students gathered information on fixture types, the number of fixtures and lamps, and burn hours. To determine the burn hours the students were required to interview teachers, administrators and librarians. Students recorded the information on the Lighting Equipment Survey sheets (Appendix 2-21).

#### **Training – Lighting Audit Software**

Students learned how to enter the data they gathered from their audits into the HECO T8 Lighting Services Worksheet (Appendix 2-23). This is an actual Excel spreadsheet format developed by HECO for use in its *Energy Solutions for Small Business Program*. Students generated audit reports to show fixture types and counts, burn hours, potential energy and cost savings, cost to retrofit, and available utility rebates. From the lap top computers and printers, students produced the reports and learned how to analyze the information.

#### **Results of School Audit**

The students audited the lighting at both of the schools totaling approximately 373,000 square feet, with a potential energy savings of 285,000 kWh per year and an estimated annual savings of \$34,000. Radford High School has completed their retrofit and McKinley is waiting its turn (Appendix 3-1).



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### **4. Student School Presentations**

Students developed PowerPoint presentations describing the training they had received and the results of their school lighting audits. They formally presented their calculations and work results to other students, teachers, school administration, PTSA, and HECO, DBEDT and U.S. Dept of Energy personnel. The presentations included recommendations how their schools could decrease electric costs and save energy. Preparations for the presentation involved accumulating school data, conducting lighting audits on the school classrooms, library and administration buildings. The students were knowledgeable and confident in their presentations. At Radford High the principal was impressed with the students' information and requested the students present again at a future meeting with the military. See Appendix 4-1 and 4-2 for copies of the presentations.

### **5. Small Business Lighting Audits**

#### **Small Business Audit Preparations**

To prepare for the small business audits, HECO provided students instruction on the basics of marketing, business plan development and sales presentation. Students developed a plan to recruit businesses interested in saving money and energy by retrofitting their fluorescent lights. The class divided into audit teams and decided what role each team member would take while conducting the audits. Students chose either to be the team manager, computer tech, marketing manager, auditor, or engineer, each having a special responsibility. Knowing that they may face rejection from uninterested businesses, the teams named at least three businesses they would approach for participation (Appendix 5-1). The goal was to have each team conduct one audit (10 audits per class).

The businesses on Oahu were informed about the student's venture through an article discussing the Energy Smart Schools in the HECO bill stuffer *Consumer Lines*, (Appendix 9-1). Students were given copies of this flyer as an article of validity when approaching businesses. As a cohesive unit, students from each school designed marketing flyers (Appendix 5-2). They were asked to reflect on the benefits of energy efficiency for their family, schools, and community businesses in order to design and produce window static stickers to give to participating businesses (Appendix 5-3 and 5-4). The teams scheduled a date with the small business to conduct the audit. Students exchanged phone numbers so that they could contact each other to schedule audit times and coordinate transportation and meeting arrangements.

#### **Small Business Audits**

On their own time, students completed lighting audits on a total of 24 small businesses. They met with the owner or the employee to determine hours of operation. The students walked around the location to gather data on fixture types and counts. Students informed

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the business contacts that they would be returning to present the results (audit reports) at a later date. Students had a chance to apply everything they had learned throughout the Energy Smart Schools program in order to complete the business lighting audit reports.

### **Small Business Reports**

After conducting the physical lighting audits, the students brought the completed survey sheets back to class. The information from the survey sheets was entered into the Excel T8 Lighting Retrofit spreadsheets (Appendix 2-23). The auditing teams worked on computers to generate the audit report calculations. Students returned to the small businesses with the reports. A Business Confirmation Form (Appendix 5-5) was given to the small business contact to verify completion of the presentation. A phone call was placed by the HECO program representative to the small businesses to discuss their experience with the Energy Smart Students and to determine if further retrofit measures were desired.

### **Money for Audits**

As promised to the students at the beginning of the semester, HECO distributed the payments for the audits to the schools. As cohesive groups, the teachers and students determined what they would do with the money. Radford's teacher and students decided to give a portion of the proceeds to the school. Another portion of the money was used to buy food and beverages for a class social. Students celebrated the completion of their work and at the same time contribute to school resources. At McKinley the teacher felt the students who did the work should get the money as a straight payment for services because they worked hard for it. This added to the real life job experience of completing a work-task for pay.

### **Results of Audits**

The students audited 24 businesses totaling 41,000 square feet, with a potential energy savings of 112,000 kWh per year and an estimated annual savings of \$13,500 (Appendix 5-6). Directly and indirectly stemming from the students' activity, 7 customers took further steps to have HECO re-audit their facility and to date, 4 have retrofitted with the HECO Energy Solutions for Small Business program.

## **6. Lighting Vendor Donation**

In the 2000 Smart Schools Program a lighting vendor executed a demonstration of a lighting retrofit and provided the material and labor free of charge. This time, the schools are actively retrofitting their lights stemming in part from past Rebuild Hawaii reports and energy savings demonstration presentations made by active Rebuild Hawaii members from HECO to the legislature, Board of Education and Department of Accounting and General Services. In 2002, donations were sought by way of classroom demonstration material from GE Lighting. Two classroom lighting exhibits were given to Rebuild Hawaii demonstrating the lamp brightness of T8's over T12's and another demonstration exhibit depicted color rendition variances between T8's and T12's.

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### **7. Teacher Surveys and Lessons Learned**

#### **Teacher Survey**

After the final workshop, the classroom teachers, Peggy Harbottle and Sophia Hu completed a survey prepared by HECO. The survey asked questions regarding the effectiveness of the Energy Smart Schools project and asked for recommendations on ways to improve the project for the next implementation. Recommendations from the first Energy Smart Schools program in 2000 were very beneficial to implementing an even better 2002 program.

#### Appendix

Response Overview (7-1)

Radford High Teacher Survey (7-2)

McKinley High Teacher Survey (7-3)

Blank Form (7-4)

An important point brought up by one of the teachers in 2002 was to present the class twice a week to improve the students' retention.

#### **Lesson Learned**

A. Make sure that the computer labs have the necessary software. Some of the students could not complete their work because the computer lab did not have the MS software; only the computers in the business classes had it loaded on the computer.

B. Many Hawaii schools have switched to year-round or modified school schedules. This created training taking 4 weeks longer than anticipated.

C. The 2000 program worked with 11<sup>th</sup> and 12<sup>th</sup> graders. In 2002, we worked mostly with 9<sup>th</sup> graders who took longer to grasp the concepts. Upper classes are preferable for this progressive class.

### **8. Workshop Summaries and Evaluations**

The Energy Smart Schools instructor kept a weekly summary, updating the original syllabus with responses and evaluations (Appendix 8-1). In addition to the summary, the instructor also completed a more detailed Workshop Evaluation. Photographs and student work examples are inter-mixed in this appendix section.

### **9. Publicity**

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HECO ran an article promoting the Energy Smart Schools program in the electricity's bill stuffer *Consumer Lines* (Appendix 9-1).

Press releases (Appendix 9-2) were distributed to the media discussing the program and inviting them to attend a lighting audit conducted by an Energy Smart Schools student team at a small business in the community. HECO filmed the team of students while conducting the lighting audit at Precision Radio. A Honolulu Star Bulletin photojournalist also attended the event and took pictures and notes; a photo and caption were featured in the Star Bulletin newspaper (Appendix 9-3).

Rebuild Hawaii featured the Energy Smart Schools Program in the Fall 2002 newsletter (Appendix 9-4).

HECO videotaped Energy Smart School classes, the students' school library audits, their public speaking PowerPoint presentations and a small business lighting audit. The resource was to be used as training lessons for the students and as Energy Smart Schools infomercials edited by HECO and broadcast during the HECO Electric Kitchen television cooking show (Appendix 9-5 - see video tape).

Another edited version of the videotaping was developed for Rebuild Hawaii to share the Energy Smart Schools program with other Rebuild members and potential members at industry expositions (Appendix 9-5 scripts; 9-6 video tape)

### **10. Conclusion**

With the school principals' support, the teachers went to great lengths to modify their lesson plans to allow the time spent diverging from typical classroom work. Knowing the teachers are making this allowance and taking the children's education to heart, a lot of time and dedication is required from the primary outside participants; the Energy Smart Schools instructor and HECO project manager. The utility's capacity to allow the volume of staff involved in the program was very beneficial to the substance of the course. The unique experience gained by the students, their excited involvement, and their willingness to do extra-ordinary assignments makes the entire process worthwhile.

Nurturing the relationship between the various Rebuild Hawaii partners and the Department of Education allowed energy efficient lighting retrofits to take place at the public schools. Reinforcing the knowledge and need of energy efficiency in the schools helped to promote actual implementation. Students from McKinley High School wrote letters of appreciation for the privilege of participating in the Energy Smart Schools program (Appendix 10-1).

The students were asked to go beyond their comfort zone of school and reach out to work with neighboring businesses. This gave the Energy Smart Schools students the experience that exceeds the standards at school today.

## Rebuild Hawaii Energy Smart Schools 2002

Graduating students have referenced their participation in the Energy Smart Schools class on their college entrance papers, which demonstrates the importance of this Rebuild Hawaii project.